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SECTION 5: ENVIRONMENTAL CONSEQUENCES

Environmental and Socioeconomic Consequences

5.1 INTRODUCTION

This Section describes the environmental and socioeconomic consequences of implementing the primary Army action (disposal of excess property) and the secondary action to be taken by other parties (property reuse). The proposed actions are evaluated in the context of alternatives presented in Section 3. The discussion of consequences is divided into the following four major subsections:

- **No Action Alternative.** Analysis of impacts based on resource categories (subsection 5.2).

- **Disposal Alternatives.** Analysis of impacts based on resource categories associated with implementation of the encumbered disposal (ED) alternative and the unencumbered disposal (UD) alternative (subsection 5.3).

- **Reuse Alternatives.** Analysis of impacts based on resource categories associated with reuse alternatives of various levels of intensity (subsection 5.4):

  — Medium-Low Intensity Reuse (MLIR) Alternative;
  — Medium Intensity Reuse (MIR) Alternative; and
  — Medium-High Intensity Reuse (MHIR) Alternative.

- **Cumulative Effects.** Analysis of impacts of each alternative action on all resource categories to evaluate cumulative effects expected to occur given the disposal and reuse of all Fort McClellan (FMC) excess property and other reasonably foreseeable actions within the affected environment/region of influence (subsection 5.5). Cumulative effects address past, present, and reasonably foreseeable future activities.

5.1.1 Resource Evaluation Categories

Sixteen natural, cultural, sociological and economic resource categories, as presented in Section 4, were established to provide a framework for the identification of baseline conditions. These categories have been used to analyze and describe the effects of the Army's proposed BRAC action and associated alternatives. The categories were developed based on a review of installation resources, and applicable resource protection laws and regulations. The resource categories include:

- land use
- noise
- air quality
- water resources

- geology
- ordnance and explosives
- permits and regulatory authorizations
- cultural resources
- economic development
- installation agreements
- infrastructure
- hazardous and toxic materials
- biological resources
- sociological environment
- quality of life

5.1.2 Definition of Key Terms

The following paragraphs define key terms used throughout this section.

5.1.2.1 Direct versus Indirect Impacts. The terms *impact* and *effect* are synonymous as used in this Environmental Impact Statement (EIS). Impacts may be beneficial or adverse and may apply to the full range of natural, aesthetic, historic, cultural, and economic resources of the installation and its surrounding area. Definitions and examples of direct and indirect impacts as used in this document are as follows:

- **Direct Impact.** A *direct impact* is caused by the proposed action, and occurs at the same time and place.

  Examples of direct impacts include:

  — for the No Action Alternative, the reduction in lawn areas to be mowed;
  — for the Army's disposal of FMC excess property, the potential loss of current Army forestry management practices that include the use of prescribed burns to help maintain the mountain longleaf pine (MLP) ecosystem at FMC; and
  — for property reuse, the clearing of trees and other vegetation to accommodate new development.

- **Indirect Impact.** An *indirect impact* is caused by the proposed action and is later in time or farther removed in distances, but still reasonably foreseeable. Indirect impacts may include induced changes in the pattern of land use, population density or growth rate, and related effects on air, water and other natural and social systems.

  Examples of indirect impacts include:

  — reducing the areas to be mowed could have an indirect impact on area wildlife;
  — loss of federal protection for significant cultural resources may result in the deterioration or loss of these resources at some future date; and
  — clearing of trees for new development may have indirect impact on area streams by increasing the amount of soil erosion and sediment that reaches these streams.

- **Application of Direct versus Indirect Impacts.** For direct impacts to occur, a resource must be present. For example, if highly erodible soils were disturbed at a construction site near a stream, there could be direct impact on water quality through storm water runoff. This runoff could indirectly affect aquatic species through sedimentation downstream from the construction site.

5.1.2.2 Short-term versus Long-term Impacts. In addition to indicating whether impacts are direct or indirect, this Section also distinguishes between short- and long-term impact. In this context, short- and long-term do not refer to any rigid time period and are determined on a case-by-case basis in terms of the environmental consequences of implementing the proposed action or alternative.

5.1.2.3 Significance. The term *significance* as used in National Environmental Policy Act (NEPA)

requires consideration of both the *context* and *intensity* of the impact or effect under consideration. Significance can vary in relation to the context of the proposed action. For FMC proposed actions, the context may include consideration of effects on a national, regional, and/or local basis. Both short- and long-term effects may be relevant.

Impacts are also evaluated in terms of their intensity or severity. Factors contributing to the intensity of an impact include:

- Degree to which the action affects public health or safety;
- Proximity of the action to resources which are legally protected by various statutes (e.g., wetlands, regulatory floodplains, federally listed threatened and endangered species, or resources listed in, or eligible for, the National Register of Historic Places);
- Degree to which the effects of the action on the quality of the human environment are likely to be highly uncertain or controversial;
- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts; and
- Whether the action threatens to violate federal, state or local law imposed for the protection of the environment.

5.1.2.4 Cumulative Effects. As stated in 40 CFR 1508.7 (Council of Environmental Quality Regulations), cumulative effects are defined as the "impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions."

5.1.2.5 Mitigation. Where significant adverse impacts are identified, this document describes measures that will or could be used to mitigate these effects. Mitigation alternatives generally include:

- Avoiding the impact altogether by stopping or modifying the proposed action;
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- Compensating for the impact by replacing or providing substitute resources or environments.

Mitigation associated with property disposal may be ensured through restrictive covenants in a deed, transfer documents, or other legal agreements between the party implementing an action and the federal, state, or local government agencies.

Mitigation of adverse impacts associated with the reuse of FMC property is generally the responsibility of the federal, state, and local agencies and private entities that implement reuse plans. Mitigation by non-Army entities that would avoid or reduce adverse impacts caused by reuse are expressed in the conditional "would/could" throughout Section 5.

5.1.3 Impact Analysis Process

5.1.3.1 Methodology for Analysis of Reuse Alternatives. This EIS analyzes potential environmental effects associated with the reuse of FMC excess property. The impacts associated with reuse are evaluated separately from the impacts of disposal. Reuse impact analyses are based upon intensity-based variations of implementing the Fort McClellan Development Commission (FMDC) reuse plan, with the MHIR Alternative approximating the FMDC plan, and the MIR and MLIR alternatives based on lower intensities of reuse than those expressed in the FMDC plan.

5.1.3.2 Summary of Reuse Obligations and Limitations. Army disposal of FMC would result in management of the property by other federal agencies or ownership by public and private-sector entities. Except as associated with encumbrances that might affect reuse upon transfer or conveyance, the Army would no longer manage or control activities that would occur on the land. Elimination of the Army from land use decision making would have several ramifications.

Proponency. The Army would not be the proponent for future activities on FMC lands. The FMDC reuse plan envisions multiple proponents. The entire range of possible actions that could occur, including land use planning and plan implementation, economic development, management of facilities, capital improvements, and further transfer or conveyance, would occur as a result of actions by future facility owners and managers.

Applicable Controls. Transfer or conveyance of FMC lands to other federal agencies would result in continuation of federal land management practices and application of federal statutes pertaining to resources. Transfer or conveyance of FMC lands to non-federal entities would result in continuation of many federally sponsored protections, such as those prohibiting takings of species protected pursuant to the Endangered Species Act (ESA) and requiring permits with respect to activities associated with wetlands.

Magnitude of Redevelopment. The magnitude of redevelopment would be a function of several factors, all of which, with the exception of certain encumbrances, would be beyond the control of the Army. While this EIS evaluates three reuse alternatives up to MHIR, of that portion of the installation available for transfer or conveyance, the ultimate redevelopment up to the MHIR Alternative intensity is uncertain. Some constraints identified in this EIS suggest that MHIR Alternative would be difficult to attain. For instance, the presence of the unexploded ordnance (UXO) or hazardous wastes, might preclude redevelopment of portions of the installation or result in specific areas being unsuitable for further development. Analysis of the MHIR Alternative and the other reuse alternatives, does not constitute an endorsement by the Army that such redevelopment would be warranted or prudent.

Mitigation. Examination of potential impacts resulting from disposal and reuse of FMC includes identification of mitigation actions that could avoid, reduce, or compensate for the severity of those predicted impacts. Upon disposal, and except as circumscribed by encumbrances, responsibility for implementation of mitigation actions would rest with the agencies or entities receiving the property. Where appropriate, this EIS identifies mitigation actions that subsequent managers or owners could implement to minimize or mitigate adverse impacts associated with reuse. The Army's listing of mitigation actions, as they relate to reuse, that could be implemented represents a beginning point for future owners and managers to consider as they assume stewardship of the property.

5.2 NO ACTION ALTERNATIVE

5.2.1 Introduction

Closure of FMC will result in the Army's placing all installation assets into an inactive or "caretaker" status until the property disposal process is complete. Because the decision to close FMC has been mandated by law, and since there is no certain completion date for the property disposal process, the No Action Alternative has been defined as maintaining the installation in caretaker status indefinitely.

As described in subsection 2.6.4, the Army, in consultation with FMDC, will determine the duration and required levels of maintenance for the installation's facilities and equipment in accordance with Department of Defense (DOD) guidance. Subsequent to that time frame, however, the Army may reduce the level of maintenance to that consistent with federal government standards for excess property. This latter caretaker activity level would be less intense than immediately following closure and pending transfer of assets to the FMDC. The caretaker status evaluated in this Section refers to the latter type of maintenance activities, which could occur for an indefinite period until transfer or disposal of the installation.

The environmental consequences identified in this subsection reflect the absence of current mission related activities at FMC.

5.2.2 Land Use

- **Direct.** Placing the disposal area in caretaker status will not have a direct impact on existing land use on, or adjacent, to the installation.

- **Indirect.** Indirect adverse and beneficial impacts would be expected from implementation of the No Action Alternative. Long-term adverse impacts could be expected as the physical condition of the buildings, utility systems and grounds within the disposal area could be expected to decline due to reduced maintenance under an extended period of caretaker status. This lack of maintenance and upkeep could potentially result in reduced suitability of the facilities to support reuse. Long-term minor beneficial impacts would also be expected from implementation of the No Action Alternative. Stopping all training activity within the disposal area might have a somewhat beneficial effect by decreasing erosion and noise levels, and not disturbing wildlife that use FMC habitat for nesting and roosting.

5.2.3 Air Quality

- **Direct.** A long-term beneficial impact would be a reduction in the amount and number of emission activities from normal mission related operations. Remaining activities associated with infrastructure maintenance, site remediation, and security operations would contribute only minor quantities of emissions from the use of motor vehicles, paints and solvents, and internal combustion sources such as mowing equipment, weed eaters, and tractors. The emissions from stationary sources such as boilers, space heaters and incinerators (Chemical Defense Training Facility (CDTF) and hospital incinerators will be closed) would also decrease considerably from their current levels because of the reduced on-post population.

- **Indirect.** No indirect impacts on air quality would be expected from implementation of the No Action Alternative.

5.2.4 Noise

- **Direct.** Minor beneficial impacts would be expected from the reduced noise levels associated with a reduction of activity. In contrast to normal operations, caretaker activities would not involve training activities, weapons/range training activities, or use of conventional ammunition.

- **Indirect.** Long-term minor beneficial impacts would be expected. Reduced noise levels might have a somewhat beneficial effect on wildlife including neotropical migratory birds (NTMB) that use FMC habitat for nesting and roosting.

5.2.5 Water Resources

5.2.5.1 Surface Water / Storm Water

- **Direct.** No direct impacts to surface water or storm water would be expected from implementation of the No Action Alternative.

- **Indirect.** Implementation of the No Action Alternative would have a minor beneficial impact to surface water. A reduction in the rate of application of fertilizers and pesticides may produce a minor decrease in the concentrations of these compounds in runoff. The elimination of field training will result in reduced impacts to soils from off-road vehicles, and lessen damage to vegetation and soils from impact of projectiles. The increased vegetation on training areas would retard surface water runoff resulting in reduced rates of soil erosion, and reduce the amount of sediment in surface water. Additionally, a reduction in the amount of vehicular traffic would result in lesser amounts of oil, fuels and lubricants deposited on roadways and parking lots which would result in reducing contaminated runoff from these areas.

5.2.5.2 Floodplains

- **Direct.** No direct impacts to floodplains would be expected from implementation of the No Action Alternative.

- **Indirect.** No indirect impacts to floodplains would be expected from implementation of the No Action Alternative.

5.2.5.3 Groundwater

- **Direct.** No direct impacts to groundwater would be expected from implementation of the No Action Alternative.

- **Indirect.** Implementation of the No Action Alternative has the potential to have a very slight positive benefit to groundwater. Caretaker activities will result in less vehicular traffic as well as less grounds maintenance activities. Under this alternative it is possible that less oil and grease will be deposited on the roadways and parking lots. This may reduce the amount of oil and grease that could be carried by surface water to soils and subsequently infiltrating to groundwater. Lower rates of application of fertilizers and pesticides may also result in reduced loading to the ground-water system. It is not likely that the lower use of the facilities will lead to a measurable change in ground-water quality. Deterioration of parking surfaces and increases in vegetation in training areas, may potentially occur under caretaker status. These conditions would retard surface water runoff and marginally increase groundwater recharge rates.

5.2.6 Geology

- **Direct.** No direct impacts to Geology would be expected from implementation of the No Action Alternative.

- **Indirect.** Implementation of the No Action Alternative may have a slight benefit to soils in the study area. Caretaker activities will result in lower levels of grounds maintenance. This may result in lower rates of application of fertilizers and pesticides to the lawn areas, and a resultant decrease in the potential for buildup of these compounds in the soil. Training areas would be expected to revert to brush with scattered trees once their use is discontinued. This would result in a lower rate of soil

erosion in the training areas.

5.2.7 Infrastructure

5.2.7.1 Utilities

- **Direct.** Long-term caretaker operations would require re-structuring of the utility systems, particularly water and wastewater systems, that support the Reserve Enclave and facilities. Utility services such as wastewater treatment and steam are provided by FMC facilities. The combination of wastewater flow from the Reserve Enclave and the off-post area served by the system would provide sufficient flow to maintain adequate minimum operations at the wastewater treatment plant. Boiler plant #3 would remain fully operational as part of the Reserve Enclave. The other three boiler plants would be reduced to caretaker status.

  Reduced utilization and maintenance during a prolonged caretaker status are likely to result in the gradual deterioration of the major utility components. Utility components that could be adversely impacted include: the water distribution lines, chlorination station, and storage tanks; the wastewater collection system and pump station; electrical distribution system; natural gas distribution lines; telecommunication lines; and boiler plants #1, #2, and #3. Although adverse impacts can be expected, caretaker operations will be adequate to prevent the impacts from becoming significant.

  Compared to normal operations, less water, wastewater, electricity and heating fuels would be used during caretaker status, thus representing a lower level of consumption of resources.

- **Indirect.** Most of the utilities at FMC are supplied from outside sources, i.e. water, electrical, natural gas, and telephone services. A reduction in the demand of for these services would not have adverse effects on the operations of current utility providers.

  If deterioration occurred as a result of a prolonged caretaker status, the ability to provide utility service and the quality of the service may be adversely impacted. For example, service could be disrupted by the deterioration of distribution lines, or water quality could degrade due to reduced circulation in the distribution lines and water storage tanks.

5.2.7.2 Solid Waste

- **Direct.** The amount of solid waste generated from the disposal area would become minimal during a period of extended caretaker status. Therefore, there would be a beneficial impact as a result of the No Action Alternative. The existing closed landfills would remain covered and any existing investigations or monitoring would continue to assure that the environment is not being adversely affected.

- **Indirect.** Maintaining reduced solid waste generation at FMC disposal areas would yield indirect beneficial impacts by reducing the amount of waste to be disposed in local landfills and the correspondingly reduced transportation and energy costs.

5.2.7.3 Transportation System

- **Direct.** Road access to and through the installation will continue under the No Action Alternative. All major thoroughfares (i.e. Summerall Gate Road, Baltzell Gate Road) will be dedicated to and maintained by Calhoun County, with Calhoun County also assuming the responsibility for traffic control.

- **Indirect.** Indirect impacts will be associated with vehicular traffic. Trip generation will decrease substantially under the No Action Alternative as the small caretaker force on the property would generate only a fraction of the baseline ADT (average daily vehicle trips) of 29,375. Based upon

existing traffic count data, Summerall Gate Road and Baltzell Gate Road would be most impacted of the on-post roads by this reduction in traffic, while State Route (SR) 21 (Quintard Avenue) would be the most impacted off-post roadway. Highway 431 and Lenlock Lane would also be impacted by this reduction in traffic.

5.2.8 Ordnance and Explosives

- **Direct.** Long-term minor beneficial impacts would be expected. While in caretaker status, all use of ordnance for training activities within the disposal area would cease. Consequently no additional UXO would accumulate in the FMC range areas.

- **Indirect.** Beneficial and adverse impacts would be expected. Beneficial impacts include : 1) stopping all munitions/ordnance training activity within the disposal area would have a beneficial effect by decreasing noise levels and not disturbing wildlife that use FMC habitat for nesting and roosting; and 2) the need to put out fires and maintain fire breaks may require less intensive management efforts and could result in cost savings associated with these efforts. Adverse impacts include the long-term reduction in the frequency and extent of munitions/training related fires. These fires along with prescribed burns are key to the maintenance and survival of the MLP ecosystem; consequently elimination of these fires would have a negative impact on the MLP within FMC boundaries.

5.2.9 Hazardous and Toxic Materials

- **Direct.** Long-term beneficial impacts would be expected. The Army would continue to remediate any hazardous or radiological waste contaminated sites in the disposal area in accordance with applicable federal and state statutes and regulations. Storage and use of hazardous materials would decline to a minimal level. Unused storage tanks would be drained and closed or removed in accordance with applicable federal, state, and local requirements.

  During caretaker status, asbestos containing material (ACM) and lead-based paint would continue to be subject to Army management policies and practices. Any remedial activities such as abatement of deteriorated ACM would be managed, and such materials would be disposed of properly and in accordance with all applicable federal, state, and local requirements.

- **Indirect.** No indirect impacts to Hazardous and Toxic Materials would be expected from implementation of the No Action Alternative.

5.2.10 Permits and Regulatory Authorizations

- **Direct.** No direct impacts would be expected from implementation of the No Action Alternative. The existing permits and regulatory authorizations would continue if required for caretaker operations. Expiring permits and other regulatory authorizations necessary to continue operation of the enclave and caretaker activities on the excess property would be renewed or extended. Those permits and regulatory authorizations not required for caretaker operations would be terminated.

- **Indirect.** No indirect impacts to permits and regulatory authorizations would be expected from implementation of the No Action Alternative.

5.2.11 Biological Resources

Under the “No Action” Alternative there would be some continuation of natural resources management programs including land management, pest control, forest management, and erosion control, but at reduced levels. Additionally, agreement with other Agencies would be sought to maintain the mountain longleaf pine (MLP) ecosystem through the continuation of prescribed burns and other management procedures.

5.2.11.1 Fish and Wildlife

- **Direct.** Long-term minor beneficial impacts would be expected. Beneficial impacts would occur when automobile traffic, mowing and ground maintenance, and range activities are decreased. Decreases in these activities would result in less noise, less use of fertilizer and pesticides, fewer leaks and spills of automobile fluids, and less soil disturbance.

- **Indirect.** Minor beneficial impacts would be expected. There would be less stress on aquatic species due to slightly improved water quality. Slightly more habitat would be available for common wildlife species near the cantonment area and at some of the ranges due to small increases in grassland and oldfield habitats. If the caretaker operations continued indefinitely, grasslands and oldfields would revert to shrubland and eventually forest. Any resultant increase in unfragmented forest would benefit NTMB. Small increases in the nesting success of NTMB might also occur due to reduced noise levels.

5.2.11.2 Vegetation and Plant Resources

- **Direct.** Long-term minor beneficial impacts on vegetation and plant resources would be anticipated as a result of implementing the No Action Alternative. Reduced training and administrative use of off-road vehicles will reduce the impact on vegetation in areas were vehicles are taken off road, thereby allowing the vegetation to recover.

- **Indirect.** Long-term minor adverse indirect impacts on vegetation and plant resources would be expected from implementation of the No Action Alternative. Less range activity and a smaller natural resource staff would mean fewer wildfires and prescribed burns, thereby, resulting in adverse impacts to the MLP community. The severity of the impacts would be directly associated with the duration of caretaker activities and the extent of MLP management programs. Canopy closure and leaf litter would increase at some locations. Small decreases in rare herbaceous understory plants such as sky blue aster, pale coneflower, eastern purple coneflower, and Fraser's loosestrife could occur. These changes would take several years to decades to occur.

5.2.11.3 Wetlands

- **Direct.** No direct impacts to wetlands are expected from implementation of the No Action Alternative.

- **Indirect.** Long-term minor beneficial impacts could occur due to less sediment, fertilizer, and hydrocarbon input from surface water runoff (see subsection 5.2.11.1).

5.2.11.4 Federal Threatened and Endangered Species

- **Direct.** Long-term minor beneficial impacts to Federal threatened or endangered species would occur due to less activity in the cantonment area, fewer range activities and the continuation of Endangered Species Management Plan (ESMP) measures. Decreases in cantonment area traffic, off-road vehicle use, exploding munitions, and use of night-time flares would result in less noise and disturbance along riparian corridors used by the gray bat. A Biological Assessment (BA) was prepared by the Army as part of the ongoing informal consultation with the U.S. Department of Interior — Fish and Wildlife Service (USFWS). The BA addresses the impacts of the caretaker activities on the gray bat and includes Project Design Features (PDFs) that avoid or minimize any potential impacts so that there will not be any adverse effects to the gray bat. Further protective measures will be provided in accordance with the July 1998 letter from the USACE to the USFWS.

- **Indirect.** Long-term minor beneficial impacts could occur to the gray bat if caretaker operations continued indefinitely. Over time, it is possible that with decreased activity and grounds maintenance that forest cover would increase along portions of Cane Creek that flow through the cantonment area. Based upon implementation of the Project Design Features detailed in the BA and the additional

protective measures described in the July 1998 letter from the USACE to the USFWS, no adverse impacts to the gray bat are expected.

No impacts to the red-cockaded woodpecker (RCW) are expected. Local RCW populations declined in the 1970s and currently there are no RCW colonies at FMC. The RCW population in the Talladega National Forest is not currently expanding or colonizing new areas.

5.2.11.5 Other Species of Concern

- **Direct.** Long-term minor beneficial impacts to other species of concern would occur due to less activity in the cantonment area, fewer range activities and the continuation of ESMP and other wildlife management measures. Decreases in cantonment area traffic, off-road vehicle use, exploding munitions, and use of night-time flares would result in less noise and disturbance.

- **Indirect.** Long-term minor adverse impacts would occur to mountain longleaf pine (MLP) communities. Adverse impacts would occur due to fewer range fires, reduced number of natural resource staff, and less maintenance of fire breaks. Populations of species that are fire adapted or need open canopies such as little bluestem, Indian grass, various asters, rosinweed, wild quinine, flowering spurge, and goat's rue that are associated with the MLP communities would decrease over time due to the potential reduction in prescribed burns. More complete canopy closure, and increased hardwood understories would also result in less recruitment of longleaf pine seedlings. Long-term minor adverse impacts would also occur to the white fringeless orchid (WFO) due to fewer wildfires caused by the tracer range. Tracer range wildfires and prescribed burns help prevent complete dominance of seeps by shrubs. Over time the shrub component would increase at Marcheta Hill Orchid Seep and the WFO population would decrease. This impact could be mitigated by increased management, i.e. prescribed burns at locations that contain WFO.

5.2.11.6 Integrated Natural Resources Management Provisions

- **Direct.** Minor long-term adverse impacts are expected. Funding for natural resource programs would decrease. Long-term beneficial impacts could also occur when ranges become inactive and more accessible to hunters, hikers, and birdwatchers.

- **Indirect.** Minor long-term adverse impacts are expected. Indirect benefits received from range induced wildfires, firebreaks maintained by range personnel, and controlling of access to threatened and endangered species locations within ranges would decrease. There would be a transition period before a cooperating agency could implement a prescribed burn program at FMC. If a cooperating agency that is willing to conduct an effective prescribed burn program at FMC can not be found the potential exists for long-term significant adverse impacts to the MLP communities, WFO, and other fire adapted species.

5.2.12 Cultural Resources

- **Direct.** Both minor beneficial and minor adverse effects would be anticipated. The level of activities associated with caretaker status would be lower, thus a beneficial impact will result from reducing the potential for disturbance of National Register of Historic Places (NRHP) eligible archaeological resources. The reduced activity in the cantonment and training areas associated with caretaker status might increase the potential for vandalism, an adverse impact.

- **Indirect.** There are no indirect effects to NRHP eligible archaeological resources from implementation of the No Action Alternative. Minor adverse effects would be expected for architectural resources/buildings as a result of decreased maintenance activities.

5.2.13 Sociological Resources

- **Direct.** There will be short-term adverse impacts in respect to the population loss associated with the movement of the personnel from FMC. Due to the reduced number of employees present on a daily basis, there could be increase opportunity for vandalism, loss of property, and other criminal activity such as poaching. It is expected that there will be no adverse impacts on environmental justice, Native American and ethnic concerns, or homeless and other special programs, such as children, under caretaker status. Fire protection and security will continue to be provided on-post by the caretaker force.

- **Indirect.** Minor adverse indirect impacts would be expected. Caretaker status would represent a foregone socioeconomic opportunity for reuse. For example, the benefits of job creation as a result of reuse activities would be lost until the property is conveyed to new owners.

5.2.14 Economic Development

Since closure of FMC (and the resulting loss of jobs) was a mandated action stemming from the recommendations of the 1995 BRAC Commission, the baseline against which socioeconomic impacts are assessed, in accordance with Army convention, is an installation postclosure population of zero.

- **Direct.** There will be some short-term minor economic impacts resulting from the employment of skilled and unskilled laborers for caretaker tasks, and from the purchase of maintenance supplies from local or regional vendors. However, considering the anticipated size of the caretaker workforce (estimated at less than 100), income generation and spending for services and supplies will be limited and have no major impact on the local or regional economy.

- **Indirect.** Long-term significant adverse impacts would result from the continued caretaker status and consequential lack of reuse of the disposal area. Economic opportunities and benefits, in the form of employment, business sales and income, would be postponed or lost due to lack of new economic activity. Lack of reuse would preclude the placing of the property on local tax rolls and result in loss of potential tax revenues.

5.2.15 Quality of Life

- **Direct.** No direct impacts on Quality of Life would be expected from implementation of the proposed action.

- **Indirect.** Some short-term indirect adverse impacts would be expected, with the implementation of the No Action Alternative. Upon closure of the Commissary and Post Exchange, military retirees and other eligible shoppers in the area will have to shop at four alternative military shopping facilities available within 100 miles of Calhoun County. These include Maxwell Air Force Base, Montgomery, Alabama; Redstone Arsenal, Huntsville, Alabama; Fort McPherson and Gillem, Atlanta, Georgia; and Fort Benning, Columbus, Georgia. In addition, military-provided medical services will have to be obtained elsewhere by those eligible for these services. On-post recreational facilities could be adversely impacted by lack of continual use and associated sustained maintenance.

5.2.16 Installation Agreements

- **Direct.** Short-term minor adverse impacts would be expected. Under caretaker status the Army would be unable to continue in mutual aid agreements and utilities agreements that are currently in place. Beneficiaries of these agreements would need to make other arrangements following closure of the installation.

- **Indirect.** Short-term adverse impacts on installation agreements would also be anticipated with the termination of support services to the Chemical Stockpile Emergency Preparedness Program (CSEPP). Initially these support services will be supplied by an Army CSEPP contingent remaining at FMC and by the Alabama Army National Guard (ALARNG) but at a reduced level from those supplied

currently by FMC. Medical, ambulance and related services associated with the agreements will need to be provided by another source.

5.3 DISPOSAL ALTERNATIVES

5.3.1 Introduction

Subsection 3.3 discusses the rationale associated with the development of alternatives for the primary Army action of disposal of excess property at FMC. As stated in that section:

- The Encumbered Disposal (ED) Alternative has been formulated to consider the type and degree of reuse constraints to be imposed on future owners by the Army as a condition of disposal and reuse. These encumbrances are imposed by the Army to: 1) protect future Army requirements or interests; 2) make the property available as soon as possible through the expedient disposal and reuse of parcels that are determined to be available and suitable for the intended reuse; 3) transfer the responsibility to protect important natural or cultural resources to future owners through the use of deed restrictions or covenants; or 4) meet special mitigation requirements or additional deed restrictions that are mutually agreed upon by the Army and a regulatory agency.

- The Unencumbered Disposal (UD) Alternative removes constraints and evaluates impacts that would be associated with disposal of the property without constraints on reasonably foreseeable reuse.

Subsections 5.3.2 through 5.3.16 identify the potential direct and indirect environmental impacts of ED and UD of FMC property. As detailed in subsection 3.3, encumbrances at FMC will include:

- **Wetlands.** The Army will notify the new owners of the responsibility to comply with the Clean Water Act if development is planned in, or sufficiently near to impact, wetlands.

- **Regulatory Floodplains.** The Army may impose restrictive covenants prohibiting land uses within regulatory floodplains to ensure compliance with: Executive Order (EO) 11988 (Floodplain Management); the National Flood Insurance Act; and the Flood Disaster Protection Act.

- **Threatened and Endangered Species.** In consultation with the USFWS, a Biological Assessment (BA) was prepared for the disposal and reuse of FMC. The BA assesses potential effects of the proposed action on gray bats, a federally listed endangered species. The BA describes features of the proposed action (otherwise known as Project Design Features or PDFs) intended to avoid or minimize adverse impacts to gray bats. The PDF's address actions prior to disposal, and reasonably foreseeable actions following disposal. Based upon implementation of the PDFs detailed in the BA and the additional protective measures described in hte July 1998 letter from th eUSACE to the USFWS, no adverse impacts to the gray bat are expected. Those PDFs requiring specific actions following disposal are expected to be transferred to future owners in the form of deed restrictions or protective covenants.

- **Cultural Resources.** An encumbrance requiring protection of any properties found to be eligible for the NRHP would be assigned to new owner(s) as a condition of sale or transfer.

- **Utility System Interdependencies.** Conveyance of the property assumes that the utility systems will be transferred in their current condition to independent providers that would continue providing service to existing facilities. Appropriate non-exclusive utility easements would be provided.

- **Access Easements.** Existing easements represent an encumbrance on the future use of property, and would be transferred or conveyed to new owners. Easements could also be imposed on FMC excess property conveyed to future owners to provide access by the National Guard and Reserves to areas that would be transferred to them. Additionally, easements could be imposed to provide future access to remediation sites.

- **Remedial Activities.** In conjunction with the remedial activities that might be required during an interim lease or upon conveyance, the Army would retain the right to: conduct investigations and surveys; to have Government personnel and contractors conduct remediation field activities; and to construct, operate, maintain, or undertake any other response or remedial action as required.

- **Unexploded Ordnance (UXO).** If the UXO is not fully removed, restrictive covenants would be placed in transfer or conveyance documents to prohibit future owners from terrain-disruptive activities and to impose other requirements to ensure safety and protection of human health and the environment. The level of restrictive covenants will be determined following the more detailed Engineering Evaluation/Cost Analysis (EE/CA) process, which will invite public participation, and Department of Defense Explosive Safety Board (DDESB) review and approval.

In addition to the types of encumbrances listed above which would be applied to the ED Alternative only, there are numerous Federal, state and local regulations that have been adopted in an effort to protect environmental resources. Under both the ED Alternative and the UD Alternative new land users would be required to comply with these regulations as well as any future modification in the regulations.

5.3.2 Land Use

Encumbered Disposal Alternative

- **Direct.** Long-term minor beneficial impacts would be expected based upon implementation of the ED Alternative. As a result of disposal, all training activities within the disposal area would cease, to include ordnance and smoke training operations in the training areas, thereby eliminating impacts associated with these activities on nearby land uses.

- **Indirect.** Beneficial and adverse long-term impacts would be expected on land use as a result of implementing the ED Alternative. Encumbrances will have a beneficial impact on land use as reuse activities will be restricted to those that are consistent and compatible with the preservation and protection of existing natural and cultural resources, such as historic properties, wetlands, threatened and endangered species, etc. In addition, under certain circumstances ED would facilitate property transfer for earlier subsequent reuse. However, encumbrances could restrict development types and intensity, therein affecting the marketability and competitive position of the property for subsequent development by a private or other public entity.

Unencumbered Disposal Alternative

- **Direct.** As outlined in the ED Alternative above, long-term minor beneficial impacts would be expected based upon implementation of the UD Alternative. As a result of disposal, all training activities within the disposal area would cease, to include ordnance and smoke training operations in the training areas, thereby eliminating impacts associated with these activities on nearby land uses.

- **Indirect.** Beneficial and adverse long-term impacts would be expected. The lack of any initial encumbrances restricting development would result in the property being utilized at its highest and best use without any restrictions. However, for those parcels which have encumbrances, such as the remedial activities encumbrance, the time required for removal of an encumbrance could cause a delay in property transfer because of the time required for elimination of restrictions.

5.3.3 Air Quality

Air quality regulations are designed to be protective of human health and the environment. All air emission sources must comply with both the US Environmental Protection Agency (USEPA) Clean Air Act and Alabama Department of Environmental Management (ADEM) regulations. These regulations apply to air emission sources regardless if the source is federally or privately owned. As such, air quality does not have any encumbrances.

Encumbered Disposal Alternative

- **Direct.** A beneficial impact would be expected, as a result of implementing the ED Alternative, because the remaining activities at FMC would involve fewer emission activities than current Army mission related operations. In addition, any remaining air emission sources would be significantly reduced from current levels. The level of industrial operations such as degreasing, painting, facility maintenance and vehicle traffic etc. would decrease since the Army is relocating, although it is difficult to quantify the reduction in emissions. It should be noted that the emissions will not be 100% eliminated because the Army National Guard and Army Reserve will remain and would continue to conduct similar types of activities. Overall, air emissions should be reduced as a result of the disposal, and therefore the disposal has a beneficial impact. Since the region is an air quality attainment area, there will not be emission reduction credits for the Army to use elsewhere.

- **Indirect.** A minor short-term adverse impact would be expected, as a result of implementing the ED Alternative. The Comprehensive Environmental Response and Liability Act (CERCLA) requires that before property is transferred, necessary remedial action must be completed or remedial action must be in place, proven to be operating effectively, and approved by the USEPA Regional Administrator (see subsection 5.3.9). The remedial activities encumbrance would grant access to the Government to attend to remediation equipment used at sites that have been transferred for disposal. Minor amounts of air emissions could result from remediation activities depending on the contamination, type of treatment system, equipment and capture technology. For example, if the remediation system utilized an air stripper there would be air emissions associated with the remediation process. However, if the system utilized a carbon adsorption unit for water treatment there would not be any air emissions. The Government will need access to the remediation site to ensure proper operation and maintenance of the remediation system. These activities are indirect because the primary action is remediation, not a process typically associated with air emissions. Any potential air emissions associated with remediation would be temporary and are not anticipated to have a significant adverse impact on air quality.

Unencumbered Disposal Alternative

It is anticipated that implementation of this Alternative would result in direct or indirect impacts on air quality that are similar to those described in the ED Alternative because the Federal and state air quality regulations are applicable regardless if the facility is federally or privately owned.

- **Direct.** Same as the ED Alternative.

- **Indirect.** Same as the ED Alternative.

5.3.4 Noise

Encumbered Disposal Alternative

- **Direct.** Beneficial impacts would be expected as a result of implementing the ED Alternative. The cessation of training activities on the Main Post would result in an overall decrease in noise levels at FMC.

- **Indirect.** Short-term minor adverse impacts would be expected, as a result of implementing the ED Alternative. Some remedial activities, such as well installation, construction of groundwater treatment facilities, transportation of contaminated media, or UXO removal actions could create localized noise impacts. These noise producing activities would affect only the immediate vicinity, however, and would occur only during daytime hours.

Unencumbered Disposal Alternative

- **Direct.** Beneficial impacts would be expected as a result of implementing the UD Alternative. As discussed in the ED Alternative, the cessation of training activities on the Main Post would result in an overall decrease in noise levels at FMC.

- **Indirect.** Short-term minor adverse impacts, associated with implementing the UD Alternative, would be expected. These impacts would be similar to those described for the ED Alternative, and might include remedial activities, such as well installation, construction of groundwater treatment facilities, or transportation of contaminated media could create localized noise impacts. Short-term minor adverse impacts would also be expected with the removal of UXO encumbrance from locations throughout FMC. Implementation of the UD Alternative would result in short-term increases in noise levels related to excavation and removal of UXO and possibly detonation in place.

5.3.5 Water Resources

5.3.5.1 Surface Water

Encumbered Disposal Alternative

- **Direct.** There will be no direct impact to surface water from implementation of the ED Alternative.

- **Indirect.** Implementation of the ED Alternative will result in both long-term beneficial and adverse impacts to surface water. Beneficial impacts include: 1) Implementation of remedial hazardous waste cleanup activities may result in reduced potential for release of contaminants to surface water; and 2) Vegetation growing up in areas currently not vegetated may influence surface stormwater drainage.

  Under the ED Alternative, a range of options exist for UXO removal which may have adverse impacts on surface water. All UXO may be left in place, or varying amounts may be removed. In the event that UXO clearance activities are performed, there will be indirect short- and long-term adverse impacts to surface water. Impacts from the UXO removal operations may include increased turbidity associated with sediments eroded from the disturbed area, siltation of stream channels and impoundments and disturbance of the stream channel by equipment movement. The degree of the impact will be dependent upon the depth and aerial extent land clearing associated with the UXO removal as well as the slope and soil type present.

Unencumbered Disposal Alternative

- **Direct.** Implementation of the UD Alternative will result in a significant adverse short- and long-term impact to surface water. The impact will be the result of UXO removal operations directly in the channel of creeks and streams.

  Implementation of the UD Alternative may result in components of the stormwater system being owned by a variety of land owners. Under this alternative there would be no single owner or agency responsible for maintenance of the stormwater system and compliance with National Pollution Discharge Elimination System (NPDES) permits.

- **Indirect.** Implementation of the UD Alternative will result in a significant short-term adverse impact to surface water. Under the UD Alternative, all of the UXO will have to be identified and removed. This will create extensive disturbances to soil and vegetation which will result in greatly increased soil erosion. The increased soil erosion will result in widespread short-term, problems with sedimentation and turbidity in surface water.

5.3.5.2 Floodplains

Encumbered Disposal Alternative

- **Direct.** Under the ED Alternative, a range of options exist for the UXO. All UXO may be left in place, or varying amounts may be removed. In the event that UXO clearance activities are performed, there may be direct short- and long-term adverse impacts to floodplains if UXO identification and removal activities are conducted in floodplains. The magnitude of the impact will be dependent upon the lateral and vertical extent of the UXO removal as well as the specific location.

- **Indirect.** UXO removal operations under the ED Alternative could result in adverse short- and long-term impacts to floodplains from sedimentation from increased erosion caused by the clearing of vegetation and the disturbance of soils. The degree of the impact will be dependent upon the extent and location of the UXO removal activities.

Unencumbered Disposal Alternative

- **Direct.** Implementation of the UD Alternative will result in significant adverse short- and long-term impacts to floodplains. The impacts will be the result of UXO removal operations directly in the floodplains.

- **Indirect.** Implementation of the UD Alternative will result in both short- and long-term significant adverse impacts to floodplains. Under UD, all of the UXO will have to be identified and removed. This will create extensive disturbances to soil and vegetation which will result in greatly increased soil erosion. The increased soil erosion may result in problems with sediment accumulating in floodplains.

5.3.5.3 Groundwater

Encumbered Disposal Alternative

- **Direct.** Under an ED Alternative, encumbrances may be put in place to allow for installation and operation of systems to directly remediate groundwater. This would result in a localized long-term benefit to groundwater. Alternatively, encumbrances could be employed to restrict future uses of groundwater in lieu of groundwater remediation. This would result in localized long-term adverse impacts to groundwater.

- **Indirect.** Implementation of the ED Alternative will result in both minor long-term beneficial and adverse impacts to groundwater. Implementation of environmental remediation activities will result in lowered potential for release of contaminants to groundwater. Removal of UXO will require removal of vegetation, which could lead to greater run off and thus lower groundwater recharge rates. The degree of the impact will be dependent upon the extent and location of the UXO removal operations.

Unencumbered Disposal Alternative

- **Direct.** Implementation of the UD Alternative will require that the known groundwater contamination at the former landfills, and other locations, be treated to meet drinking water standards. This would result in a long-term beneficial impact to groundwater. It is possible that remediation of groundwater to these levels is not feasible.

- **Indirect.** Implementation of the UD Alternative may cause an indirect, long-term adverse impact to groundwater. The identification and removal of UXO would alter groundwater flow paths by disturbing infiltration rates and preferential flow paths. It is not expected to have any significant effect to regional springs and flow paths. However, small springs and seeps which are reliant upon localized sources of recharge and flow paths could be adversely impacted. The remediation of groundwater required to implement the UD Alternative could delay disposal and reuse of areas around the former landfills.

5.3.6 Geology

Encumbered Disposal Alternative

- **Direct.** Under the ED Alternative, a range of options exist for the UXO. All UXO may be left in place, or varying amounts may be removed. In the event that UXO clearance activities are performed, there will be direct short- and long-term adverse impacts to soils. In the areas that UXO will be removed from, vegetation will be stripped and extensive grading and reworking of the soil will be required. This will lead to a destruction of the soil structure as well as lead to extensive erosion of the soil.

- **Indirect.** Implementation of the ED Alternative will result in a minor long-term beneficial impact to geology and soils. Remedial HTRW activities may result in a lower potential for release of constituents from contaminated sites. The magnitude of the impact will depend upon the degree and type of site remediation performed.

Unencumbered Disposal Alternative

- **Direct.** Implementation of the UD Alternative will result in significant direct short- and long-term significant adverse impacts to geology and soils. Exploration and removal of UXO will result in total destruction of the soil structure from excavation. This activity will result in a greater potential for soil erosion, especially in areas with steep slopes. The fertility of the soil and its ability to support vegetation will be adversely impacted.

- **Indirect.** There will be no indirect impact from implementation of the UD Alternative.

5.3.7 Infrastructure

5.3.7.1 Utilities

The major utility systems include water, wastewater, electric, natural gas, and communications. The three steam systems within the excess area are not considered major utility components.

Encumbered Disposal Alternative

Under the ED Alternative, the major utility components would be disposed as whole systems rather than transferring ownership of utilities to entities with each parcel. The non-Army entity would provide utilities to the enclave and other occupants of the excess properties after transfer has occurred. Initially following transfer, the existing distribution and collection systems, as described in subsection 4.7, would be used to provide utility service. Once the transfer of the utility systems to a non-Army entity has occurred, the new utility purveyor may alter the major utility components and their configuration to better serve the area.

The parcels containing the facilities that house the boilers would have the option of using the steam plants and distribution systems associated with those boilers. Parcels separated from the steam systems would have to arrange for continued steam supply with the new owner of the boiler plant or install new independent heating systems.

- **Direct.** Property sold or transferred to new owners would include easements in the deed to allow access to the utility systems by the new utility purveyor. Transferring ownership and service responsibilities of the utility systems will cause no impact or interruption of service to areas currently served on FMC. The new utility providers would be required to manage the resources in accordance with all applicable federal, state and local requirements so that there should be no adverse impact to the environment.

- **Indirect.** Once the transfer of the utility systems to a non-Army entity has occurred, the new utility purveyor may upgrade the major utility components and their configuration to better serve the area. These upgrades may result in abandonment, replacement or relocation of existing utilities components. Excavation associated with these activities could increase erosion and sediments

transported into area waterways. With proper erosion control practices during construction no adverse impact is anticipated.

Unencumbered Disposal Alternative

Unencumbrance of the utility systems would require that new owners of the excess property be responsible for arranging their own utility service. The new property owners would have to arrange for their own service connection from a utility provider or supply their own energy, water, and wastewater treatment. Supplying their own utility needs would result in the abandonment of a parcel's existing utility components, freeing the parcel from the interdependencies and access easements. In some cases, arranging for a new utility service connection could result in abandoning all or portions of utility systems that currently exist on a parcel. Therefore, either scenario could free parcels from utility interdependencies and would eliminate the need for access easements by utility providers except where subsequently established by the new owners.

- **Direct.** Direct adverse impacts to the environment would be expected if individual parcel owners were required to provide their own utilities. Individual wastewater treatment systems would increase the number of discharge points making it more difficult to assure that the environment is not being adversely affected. Treated effluent from individual systems would have a greater likelihood of adversely affecting surface waters and groundwater in the area. Individual power generation would not be as energy efficient, as centralized systems, and would have greater potential to increase noise and air emissions in the area.

  The parcels containing the facilities that house the boilers would have the option of using the steam plants and distribution systems associated with those boilers. Installation of multiple new heating sources for individual facilities separated from the steam system would not impact the environment. In most cases, a new heating source would be expected to be more energy efficient.

- **Indirect.** If abandoned, the existing underground utility conduits could cause a long-term adverse impact to the environment by providing a preferential pathway for potential subsurface contamination migration. If existing utility distribution and collections systems were removed or new service connections are established, the large amount of excavation required could cause a short-term adverse impact to surface water quality and vegetation.

5.3.7.2 Solid Waste

Encumbered Disposal Alternative

- **Direct.** The ED Alternative would transfer the landfill areas with the landfills in-place. Appropriate notifications and deed restrictions would be included to: inform future owner(s) of existing conditions; ensure that landfill caps, drainage structures and monitoring wells are not disturbed; and to ensure that the Army can obtain long-term access (via easements if required) to maintain and/or monitor landfill conditions. Plans exist to close and cap landfill #4 in accordance with Resource Conservation and Recovery Act (RCRA) Subtitle D requirements. This action would not result in any impact to existing or future solid waste streams. Subsection 5.3.9 considers the impacts of ED in regard to Environmental Restoration and Compliance procedures that are being followed for all potentially contaminated sites.

- **Indirect.** No indirect impacts would be expected from the implementation of the ED Alternative.

Unencumbered Disposal Alternative

- **Direct.** Due to the cost and the potential environmental ramifications, excavation and removal of the closed FMC landfills so that the excess areas could be disposed as unencumbered is not considered to be feasible. However, if this action were taken, it would result in a significant adverse impact due to

the magnitude of the excavated solid waste which would require redisposal. In addition, relocation of the existing groundwater monitoring wells to reduce or eliminate the Army easement requirements is not feasible since these wells are located in specific areas prescribed by the configuration of the landfills, existing landforms, and surface and subsurface water flows. The Army is responsible for the continued monitoring of these landfills in accordance with approved closure and post-closure plans, and there are no plans to transfer this monitoring responsibility to future land-owners.

- **Indirect.** Due to the volume of waste excavated from FMC landfills, an indirect adverse impact would occur at regional landfills identified to receive the excavated material. An indirect benefit would be that current landfill areas at FMC would generally be available for reuse.

5.3.7.3 Transportation System

Encumbered Disposal Alternative

- **Direct.** No direct impacts to local and regional transportation, especially the road system, would be expected as disposal of the property in itself would generate no new traffic.

- **Indirect.** Traffic volume could be impacted beneficially as ED in selected portions of the disposal area could result in lower intensity development with an associated reduction in traffic generation as compared to the UD Alternative.

Unencumbered Disposal Alternative

- **Direct.** No direct impacts to local and regional transportation, especially the road system, would be expected as disposal of the property in itself would generate no additional traffic.

- **Indirect.** Traffic volume could be impacted adversely as UD in selected portions of the disposal area could result in higher intensity development with an associated increase in traffic generation as compared to the ED Alternative.

5.3.8 Ordnance and Explosives

Over the life of a military range, the types and quantities of ordnance and explosives expended on the range vary due to changes in mission, training needs, and technology. Because of limited land availability and safety requirements, new ranges are often constructed on top of old ranges. Thus a variety of military ordnance and explosives, including unexploded ordnance (UXO) may exist on a military range as a result of the different types of weapons that have been employed on the range during its life cycle.

As noted in a 1994 DOD Inspector General report (DOD, 1994b) despite recent attempts to develop, evaluate, and identify innovative, cost-effective, commercially available systems for the detection, identification and removal of UXOs, technology performance has shown system detection capabilities for large area surveys have performance limitations that vary with ordnance type, terrain, soil types, and other factors. At the present time there is no single system or technology (including magnetometry, infrared and ground-penetrating radar) that can efficiently accomplish the task of identifying and removing UXOs from military ranges:

> *"…To date, there has been limited success in identifying UXO on or near the cleared surface. Detecting and identifying UXO underground presents a much greater challenge …We found that relatively primitive detection and 'pick and shovel' removal methods are typically used for ordnance and explosive waste cleanup. The basic approach is to remove as much vegetation as possible, mark off grids, then use crews with hand held magnetometers to 'sweep' the area. The magnetometers will detect any metal to a maximum depth of approximately three feet. When a metal object is detected, it is exposed by careful hand excavation. Most of the objects identified through that*

procedure are simply non-explosive scrap metal. However, when UXO is found, it is either destroyed in place or removed to a safe location for destruction. Those procedures are usually labor intensive and thus very expensive. The dangerous nature of the work requires the use of highly trained Explosive Ordnance Disposal (EOD) personnel."
(DOD, 1994b)

As the UXO disposal method described above is only effective in detecting UXOs to a depth of approximately three feet, military ranges that may have UXOs imbedded at depths of greater than three feet must be cleared using the method, then have the soil removed to a depth of approximately three feet and the process completed again and again until the maximum anticipated depth of UXOs has been cleared. This relatively large-scale excavation of military ranges would not only be expensive, but is known to have serious environmental impacts.

Consequently, under an action that is separate and independent of this EIS, DOD is proposing a rule that identifies a process of evaluating appropriate actions on Closed, Transferred and Transferring Military Ranges, including all ranges owned, leased, possessed or otherwise used by DOD elements in support of DOD national defense mission. On September 26, 1997, DOD published a proposed *Department of Defense Range Rule (for Closed, Transferred and Transferring Military Ranges)* which was available for public review and comment. The estimated timeframe for finalization of this rule, and the associated procedures for defining response actions to address the unique risks posed by military munitions and other associated materials, is late-1998.

Encumbered Disposal Alternative

UXO clearance requirements for the encumbered disposal of FMC excess property will be determined via the EE/CA or Range Rule processes. It is anticipated, however, that based upon the soil types, topographic features (i.e. slope), vegetation, current land uses, and planned reuse, that under the encumbered disposal alternative, more UXO removal actions will take place in Redevelopment (Area 1) than in Passive Recreation Area (Area 2). Consequently impacts will be greater in the area slated for redevelopment (Area 1) and less in the area slated for passive recreational use (Area 2).

- **Direct.** Implementation of the ED Alternative entails the use of restrictive covenants to protect human health, safety, and the environment including the potential for restrictions on the use of the property. The ultimate decision regarding the amount, if any, of UXO removed, under the ED Alternative, will be determined in the Engineering Evaluation/Cost Analysis (EE/CA). The EE/CA will determine the extent of UXO throughout the disposal area and present recommendations concerning the type of reuse that can be supported within the disposal area, and cleanup or removal recommendations. The impacts associated with ED Alternative will be directly associated with the extent of UXO removal authorized by the DDESB. The extent of short-term and long-term environmental impacts associated with UXO clearance could vary from no impact, if no UXO removal is required or authorized, to significant impacts if a large number of acres of land are cleared in a manner requiring the extensive removal of soils and ground cover. The principal direct impacts associated with UXO clearance activities will be the removal of vegetation and soil which would adversely influence both plants and animals in the clearance areas. The extent of the impact will also be influenced by the degree of vegetation removal required (e.g. understory only versus total removal of all vegetation) and the habitat type of the removal activity (e.g. maintained/mowed range area or old field versus mountainous forest area or MLP ecosystem).

- **Indirect.** Indirect impacts associated with implementing the ED Alternative would also be directly related to the extent of UXO clearance activities. The extent of adverse indirect impacts could vary from no impact (if no UXO removal is required or authorized) to significant (if large numbers of acres of land are cleared in a manner requiring the extensive removal of soils and ground cover). Adverse indirect impacts would principally be related to soil erosion from the clearance activities. The extent of the adverse impacts would be related to the amount/depth/type of soils removed and the location within FMC. UXO clearance activities in the eastern half of the installation, where slopes are steep and soils highly erodible, would result in more soil erosion than if activities occurred in the western

flatter portions of FMC. This erosion would adversely impact the terrestrial habitats via the removal of soils and vegetation. Aquatic habitats would also be adversely impacted by sedimentation/siltation in the affected watersheds. Indirect adverse economic impacts may potentially occur under ED if UXO removal actions or UXO land use restrictions limit the ability or desirability of parcels to be redeveloped in accordance with the approved community reuse plan.

Unencumbered Disposal Alternative

UXO clearance for unencumbered disposal of FMC will require that the entire disposal area be cleared to unrestricted use levels. Based upon the soil types, topographic features (i.e. slope), vegetation, current land uses, and planned reuse, it is anticipated that, under the unencumbered disposal alternative, the impacts to the Passive Recreational Area (Area 2) will be significantly greater than the impacts to the area slated for the Redevelopment Area (Area 1). Significant adverse impacts would be expected in most of Area 2, with significant adverse impacts in Area 1 being localized and easier to mitigate.

- **Direct.** UD would include restoring the entire disposal area to unrestricted use, including excavation and removal of UXO, and/or possibly detonation in place. In order to achieve unrestricted use, UD would entail the removal of all UXO within the disposal area. The removal of all UXO within the total disposal area may not be feasible due to: 1) the limited ability to identify UXO, 2) the limitations of UXO removal technology, 3) ecological damage, and 4) excessive cost.

  UD would have significant short-term and long-term adverse impacts on the environment. The principal direct impacts associated with UXO clearance activities will be the removal of vegetation which would adversely influence both plants and animals in the clearance areas. The extent of the impact will also be influenced by the degree of vegetation removal required (e.g. understory only versus total removal of all vegetation) and the habitat type of the removal activity (e.g. maintained (mowed) range area or old field versus mountainous forest area or MLP ecosystem). Based upon the apparent extensive amount of UXO throughout much of the FMC disposal area and the location of much of the UXO in the mountains of the eastern portions of the installation (where the large blocks of forest occur including MLP ecosystem), it is likely that UD will have a significant adverse impact on the biological resources of FMC.

- **Indirect.** Indirect impacts associated with the UD would be directly related to the amount/depth/type of soils removed, the type of vegetation in the removal areas and the location within FMC. UXO clearance activities in the eastern half of the installation, where slopes are steep and soils highly erodible, would result in more soil erosion than if activities occurred in the western flatter portions of FMC. This erosion would adversely impact the terrestrial habitats via the removal of soils and vegetation. Aquatic habitats would also be adversely impacted by sedimentation/siltation in the affected watersheds.

  Based upon the necessity to disturb large amounts of soil to remove all the UXO under the UD, significant adverse impacts associated with soil erosion, damage to terrestrial habitats, and sedimentation of streams and low lying riparian habitats would be expected.

  Indirect beneficial economic impacts may potentially occur under UD in that there would be no UXO land use restrictions. Consequently all parcels could be fully redeveloped and not constrained by UXO encumbrances.

5.3.9 Hazardous and Toxic Materials

Before excess DOD property can be disposed, a Finding of Suitability for Transfer (FOST) must be recorded. A FOST can not be completed without necessary remediation or disclosure of sites contaminated with hazardous or toxic materials. As discussed in subsection 4.9, the Environmental Baseline Survey (EBS) at FMC identified numerous sites having potential hazardous or toxic material conditions that would require additional investigation and possibly remediation. Sites requiring additional investigation were identified within Community Environmental Response Facilitation Act (CERFA) parcel categories 2 through 7. A BRAC Cleanup Plan (BCP) is being prepared for FMC that will address the

investigations needed at these CERFA parcels and prescribe remedial actions and monitoring where appropriate.

CERCLA requires that before property is transferred, necessary remedial action must be completed or remedial action plans must be in place or in operation. Plans or remediation must be proven to be effective, and approved by the USEPA Regional Administrator. If additional remediation is needed beyond the date of transfer, the federal government will be responsible only for remediation that is attributable to activities of the federal government prior to transfer. CERCLA also requires that on properties where hazardous materials have been released or disposed of, the type and quantity of material and time at which release or disposal occurred must be disclosed in the transfer documents.

Encumbered Disposal Alternative

- **Direct.** The ED Alternative incorporates two different potential actions for the disposal of contaminated parcels and the completion of the FOST. One action allows for the disposal of property before remediation is completed (under specific conditions) while the second action involves the cleanup of the parcel(s). CERCLA allows for the early transfer of parcels, before cleanup is completed, under a specific set of conditions that are protective of human health and the environment. In general, the ED Alternative assumes that remediation of contaminated sites (landfills, hot cell, radiological lab, etc.) by the federal government will: 1) be completed prior to disposal for short-term remedial actions or 2) will continue beyond the date of property transfer for long-term remediation efforts (e.g. long-term groundwater pump and treat actions). Under these long-term cleanup situations where the remedy is in place, operational, and certified as effective by USEPA, a parcel may be transferred to a new owner(s) under restrictive conditions including: a) planned land uses must be compatible with the level of remediation, and b) the federal government retains an easement to allow access to the site.

  A September 1996 amendment to CERCLA allows Federal agencies to transfer property before all necessary cleanup actions have been taken or are in place. This provision is known as Early Transfer Authority (ETA) and authorizes the deferral of the CERCLA covenant requiring all remedial actions be completed before Federal property is transferred when the findings required by the statute can be made and the response action assurances required by the statute are given. Since FMC is not on the National Priorities List (Superfund), the Governor of Alabama must concur with the deferral request for FMC property. Notices, covenants (land use restrictions and institutional controls), access clause, response action assurance and other conditions would be part of the transfer package and deed language.

  Specific parcels that can be transferred in an encumbered status will be identified by the Army through the completion of remedial investigations at FMC (consistent with all applicable federal, state and local laws and regulations). Ongoing coordination with the FMDC will identify proposed reuse activities and the appropriate level of cleanup action required to comply with their preferred reuse plans. The investigation and remediation process is occurring as a separate and distinct process with its own public involvement component. That process will not be completed prior to the completion of this EIS. The remediation process will be designed to ensure that no significant adverse impacts occur.

DOD policy with regard to lead-based paint (LBP) and asbestos is to manage them in a manner protective of human health and the environment. Residential structures built before 1978 are assumed to have lead based paint (LBP) and LBP hazards. Any results of inspections by the Army are provided to prospective purchases of the property. For buildings constructed before 1960, LBP hazards must be abated by the government or the new owner if the building is going to be used for residential purposes such as an individual residence, child care facility, community center, dependent school, etc. An appropriate is notice given to the prospective owner. The presence of unabated LBP or LBP hazards may preclude occupancy by some portions of the population. For buildings constructed between 1960 and 1978, the Army will provide appropriate notice to the prospective owners. Information pertaining to asbestos and asbestos containing material (ACM) on the property will be provided to prospective purchasers or transferees, and where ACM is determined to be in such a condition as to pose a threat to human health at the time of transfer, it will be remediated by the DOD or the future owner prior to occupancy.

- **Indirect.** The ED Alternative allows for the disposal of property that has not been fully remediated only in those instances where the remaining hazards are compatible with the intended reuse or where it is determined (by the Army and all applicable regulating agencies) that it would be more desirable to leave a potential hazard in place than to remediate. In these cases, deed notices and restrictions would be used to disclose the specific nature of the remaining hazard to the new owner. The deed would also specify that the new owner would be responsible for any future remediation of these known hazards if conditions or the intended reuse change. Enforcement of these provisions would be the responsibility of applicable state and federal agencies. Given these conditions, no impacts would be expected.

Unencumbered Disposal Alternative

- **Direct.** Under the UD Alternative, beneficial impacts would occur because the Army would complete the environmental remediation process for all identified hazards and dispose of the property with no restriction for future uses. The extended timeframe for remediation could result in FMC experiencing longer caretaker status period with the associated impacts as described in subsection 5.2.

  Unencumbered disposal may not be feasible based upon the current knowledge of contamination at FMC and the technology available to treat the contamination. Even if it is feasible, the complete remediation of some hazardous sites may be cost prohibitive and could result in more harm to the environment than leaving them in place. For example, complete remediation of on-site landfills may require excavation which would be extremely expensive. The workers performing the remediation would be exposed to the unearthed hazards and an alternate disposal location would have to be identified. Therefore, landfill sites and other sites where complete remediation is not feasible would require that the intended reuse be consistent with the level of cleanup. In such cases, the landfill caps would have to remain undisturbed and easements would be required for access to conduct long-term monitoring. Other sites, although fully remediated, might also require long-term monitoring to satisfy applicable state and federal agencies. These sites would also require that access easements for monitoring be maintained.

- **Indirect.** There would be a long-term beneficial impact because the remediation process would eliminate any potential for contamination to off-site and affect adjacent properties.

5.3.10 Permits and Regulatory Authorizations

Encumbered Disposal Alternative

- **Direct.** With the ED Alternative, existing permits would be transferred to the new subsequent owners when feasible. If the existing permits could not be transferred, the new subsequent owners would be responsible for obtaining a new permit. Investigation and potential remediation of contaminated sites would continue until properly closed under current permits and regulatory authorizations. FMC would potentially no longer be an air emission synthetic minor source. Therefore, Alabama DEM Administrative Code 335-3-15.02-10 is not applicable and compliance documentation would not be required. Therefore, no impacts would be expected.

- **Indirect.** No indirect impacts would be expected, as a result of implementing the ED Alternative.

Unencumbered Disposal Alternative

- **Direct.** Existing permits and regulatory authorizations which cannot be transferred, would be replaced under the UD Alternative and could result in an adverse impact on reuse. Individual parcels would be responsible for arranging their own utility services with the new utility providers or, in some cases, perhaps providing their own services for water and wastewater for example. Any new water supply sources or sewage treatment services would require associated permits. The result could be an increase in the number of individual permits and permit holders.

- **Indirect.** Substantially increasing the number of discharge permits would make enforcement more difficult. Unauthorized discharges could become more common resulting in an adverse impact to the environment.

5.3.11 Biological Resources

Under the ED Alternative, a range of options exist for UXO removal. All UXO may be left in place, or varying amounts may be removed (see subsection 5.3.8). Unless otherwise noted, the following discussion of expected impacts is based on little to no UXO removal in the majority of the 11,000-acre Passive Recreation Area (Area 2). The actual extent of UXO removal for ED Alternative will be determined in the EE/CA. The discussion of expected impacts for the UD Alternative has assumed all UXO will be removed.

The Army currently manages the biological and natural resources of FMC as federal property under a wide range of federal laws, executive orders, and Army regulations and guidelines. Many of these policies require positive management actions which benefit the biological resources at FMC. The transfer from Army to private ownership could result in the overall reduction of wildlife management activities at FMC thereby resulting in adverse impacts to the biota of the area. The extent of these adverse impacts will be directly related to the extent of wildlife management activities undertaken by the future owners.

5.3.11.1 Fish and Wildlife

Encumbered Disposal Alternative

- **Direct.** No direct impacts would be expected based upon implementation of the ED Alternative.

- **Indirect.** If the ED Alternative is implemented, long-term beneficial impacts would occur for fish and wildlife resources. NTMB and aquatic species in particular would benefit from the implementation of this alternative. Leaving the UXO in place and placing permanent restrictions on development and/or other uses that required soil disturbances would prevent destruction of wildlife habitat, soil erosion, and forest fragmentation in areas that contain UXO (See Figures 4-12 and 4-13).

Unencumbered Disposal Alternative

- **Direct.** Removal of UXO in the steep, rocky, and rough mountain terrain, as well as other locations throughout FMC, would result in soil erosion that would impact water quality and aquatic species downstream of FMC boundaries. Short-term adverse impacts would occur to NTMB due to noise, dust, and other disturbances caused during removal of UXO that could interfere with feeding and nesting.

- **Indirect.** Long-term significant adverse impacts would occur to NTMB due to decrease in forest interior areas, forest fragmentation, and loss of mature forest and savanna habitat. Short-term significant adverse impacts would occur to aquatic species due to soil erosion. The increased turbidity and oxygen demand would be expected to cause moderate to high mortality of sensitive aquatic species. Long-term adverse impacts would also occur to aquatic species due to changes in watershed and stream characteristics such as deposition of silt and increases in stream temperatures due to vegetation removal.

5.3.11.2 Vegetation and Plant Resources

Encumbered Disposal Alternative

- **Direct.** It is anticipated that under the ED Alternative, construction and UXO clearance activities would be primarily confined to Area 1 (Redevelopment Area), an area that is already built up and has limited natural plant communities. UXO clearance and other soil and vegetative disturbing activities would be minimal in the Passive Recreation Area (Area 2). Consequently limited direct impacts would be expected, if the ED Alternative is implemented.

- **Indirect.** Long-term beneficial impacts would occur within the Passive Recreation Area (Area 2), if the ED Alternative is implemented. Leaving the UXO in place and placing permanent restrictions on development and/or other uses that reduce vegetation removal and soil disturbances would help to prevent forest fragmentation, spread of exotic species, removal of native vegetation, and silting of streams and wetlands. The majority of the MLP ecosystem would remain intact.

Unencumbered Disposal Alternative

- **Direct.** Long-term significant adverse impacts, particularly to the plant resources in the Passive Recreation Area (Area 2), would occur, if the UD Alternative is implemented. Excavation and other UXO removal activities would destroy MLP communities and native vegetation. Range activities that used tracers, flares, and exploding munitions have caused wildfires. Many of the areas that contain and/or are adjacent to UXO impacted areas have been exposed to re-occurring wildfires. The MLP communities often occur in current or historic range impact areas; consequently activities associated with the removal of UXO would result in a reduction in MLP communities. FMC contains the only known naturally reproducing landscape example of the MLP ecotype at one location (Hilton, 1996). If UXO removal were extensive, there could be a reduction in the MLP gene pool as both overstory and understory (seedlings and saplings) MLP were destroyed by vegetation removal and soil excavation.

- **Indirect.** Long-term significant adverse impacts would occur, particularly to the plant resources in the Passive Recreation Area (Area 2), if the UD Alternative is implemented. Clearing ranges of UXO would require the removal of the overstory. Leaf litter, canopy structure, shading, and fuel loads characteristics, related to tree removal, would change. Removal of native vegetation, forest fragmentation, and soil disturbance would create conditions that would be favorable for increases in exotic plant populations to occur, plants such as kudzu, privet, and Japanese honeysuckle would compete with native vegetation. Overall diversity of native vegetation (including MLP communities, see subsection 5.3.11.5) would be likely to decrease. The degradation of the MLP would also be expected to adversely impact NTMB's via forest destruction and fragmentation. Forest fragmentation and soil erosion would also be expected to increase, further negatively impacting the biota of the area. Reestablishment of native communities destroyed by UXO removal, if possible, would be long-term and would require intensive management. Reestablishment of the MLP ecosystem to pre-UXO removal conditions would be difficult with moderate removal of UXO and highly unlikely with extensive removal of UXO.

5.3.11.3 Wetlands

Encumbered Disposal Alternative

- **Direct.** No direct impacts would be expected to Area 2 wetlands, if the ED Alternative is implemented, since minimal development is planned for this area. Within Area 1, impacts to wetlands could occur in association with remedial action activities (e.g. Landfill 3 remediation) and with UXO removal activities.

- **Indirect.** Long-term beneficial impacts could occur, if the ED Alternative is implemented. Leaving the UXO in place, particularly in Area 2, and placing permanent restrictions on development could prevent clearing, dredging and filling within, or adjacent to wetlands.

Unencumbered Disposal Alternative

- **Direct.** Adverse impacts may occur, if the UD Alternative is implemented. Impacts to wetlands containing UXO would be significant as removal activities, within the total disposal area, may result in the dredging or excavation of these areas (at this time it is not known if UXO is present within wetland areas).

- **Indirect.** Long-term adverse or significant adverse impacts could occur, if the UD Alternative is implemented. Clearing of vegetation and excavation of soil to remove UXO, throughout the total disposal area, would increase sediment loading to wetlands. Excavation of UXO in the mountain slopes could alter the area recharge and hydrology, thereby adversely impacting the mountain seeps (wetlands).

5.3.11.4 Federal Threatened and Endangered Species

Encumbered Disposal Alternative

- **Direct.** No adverse effects would be expected, if the ED Alternative is implemented. Pursuant to Section 7 of the Endangered Species Act (ESA), FMC is currently conducting informal consultations with the USFWS to identify any measures that might be required to avoid any adverse effects to the gray bat. Based upon the implementation of PDFs included in the Biological Assessment (BA) prepared by the Army in consultation with the USFWS, no adverse effects to the gray bat are expected.

- **Indirect.** Long-term beneficial impacts would occur, if the ED Alternative is implemented. Leaving the UXO in place and placing permanent restrictions on development and/or other uses that required vegetation removal along riparian areas and soil disturbances would prevent destruction or degradation of habitat (and potentially improve the habitat) that is used by the gray bat.

Unencumbered Disposal Alternative

- **Direct.** Long-term adverse effects could occur, if the UD Alternative is implemented. The loss of protective management measures, currently provided as a result of current FMC management policies, would directly impact the gray bat at FMC. A BA was prepared to identify potential impacts and PDFs. The implementation of these PDFs is important for the protection of the gray bat at FMC.

- **Indirect.** Long-term adverse effects could occur. It is unlikely that the UD Alternative could be fully implemented without removing vegetation along riparian corridors used by the gray bat. Vegetation removal and soil excavation in the stream's watershed could also cause adverse impacts by impacting water quality and reducing aquatic insects that the gray bat feeds upon. It is likely that implementation of the UD Alternative would require formal consultation with the USFWS.

5.3.11.5 Other Species of Concern

Encumbered Disposal Alternative

- **Direct.** No direct impacts would be expected, within Area 2, if the ED Alternative is implemented since minimal activities associated with disposal (e.g. hazardous waste remediation and UXO removal) are anticipated in this area. Within Area 1, impacts would be limited to a few areas (e.g. Reynolds Hill Turkey Oak special interest natural area (SINA) and scattered MLP sites) located in the southwestern portions of FMC that are located within the fringes of Area 1 and maybe subject to disposal related activities.

- **Indirect.** Long-term beneficial impacts would occur, if the ED Alternative is implemented. Leaving the UXO in place, in Area 2, and placing restrictions on development and/or other uses that required soil disturbances would ensure that the majority of the forest block at FMC would remain intact (see Figures 4-12 and 4-13), would prevent destruction or degradation of habitats that either contain, are suitable habitat for, or serve as buffers for WFO, three-flowered hawthorn, and other state ranked species.

Unencumbered Disposal Alternative

- **Direct.** Long-term significant adverse impacts would occur, particularly in Area 2, if the UD Alternative is implemented. Soil excavation and other UXO removal activities, throughout the entire disposal area, would destroy actual populations, suitable habitat, and/or buffer areas for state ranked plant populations. Range activities that used flares and exploding munitions have caused wildfires that approximated natural fire regimes. For this reason, many of the areas that contain UXO also contain the best examples of MLP communities. High quality and old growth MLP communities have been identified as Special Interest Natural Areas (SINA) at FMC. Clearing these ranges of UXO would require the removal of MLP communities. State ranked herbaceous understory plants, such as sky blue aster, pale coneflower, eastern purple coneflower, and Fraser's loosestrife that are fire adapted or need an open canopy often persist in range impact areas also. It is unlikely that these communities could be recreated after complete removal of vegetation and excavation of the soil. Reestablishment of the MLP ecosystem to pre-UXO removal conditions would be difficult with moderate removal of UXO and highly unlikely with extensive removal of UXO.

- **Indirect.** Long-term significant adverse impacts, particularly in Area 2, would occur, if the UD Alternative is implemented. Excavation of soil, during UXO removal, in the watersheds containing seeps (e.g. Marcheta Hill Orchid Seep, Bains Gap Seep, etc.) could alter hydrology and impact the

WFO and other species endemic to these SINAs. Fragmentation of the forest block at FMC would alter the forest ecosystem. The ecological importance of the MLP ecosystem is based on its unfragmented condition, large size, lack of exotic species. Fragmentation could allow an increase in exotic plants and reduce the effective size of the ecosystem.

5.3.11.6 Integrated Natural Resources Management Provisions

Encumbered Disposal Alternative

- **Direct.** No direct impacts are expected, if the ED Alternative is implemented. The natural resources at FMC would not be significantly altered before being transferred to another organization. Existing natural resource programs and management plans developed by the Army would be applicable to and usable by the new owner(s).

- **Indirect.** Minor short-term adverse impacts could occur during the transition period, if the ED Alternative is implemented. The receiving organization would have to become familiar with the installation, location of threatened and endangered species locations, firebreaks and roads, local community, etc. Inefficiencies and minor management mistakes would be expected for a short period after obtaining a new, relatively unaccessible 10,000 to 12,000 acre ecosystem.

Unencumbered Disposal Alternative

- **Direct.** Short-term significant adverse impacts would be expected if the UD Alternative is implemented. A shift in priorities would occur. Erosion control projects would have to significantly increase after UXO removal. Exotic plant control and reforestation projects would need to be implemented. Funding and manpower would be shifted from management of threatened and endangered species, SINA, MLP communities, and state ranked species to erosion control and revegetation of disturbed areas. Long-term adverse impacts would also be expected.

- **Indirect.** Long-term beneficial impacts to hunting programs could occur, if the UD Alternative is implemented. However, it would require several years after UXO removal, for sufficient vegetation and animals to recolonize the area to support hunting activities. The creation of grassland, forbland, shrubland, and other early successional habitats could benefit populations of game species such as rabbits, deer, turkey, and northern bobwhite.

5.3.12 Cultural Resources

Encumbered Disposal Alternative

- **Direct.** Following the completion of two ongoing cultural resources investigation reports, the archaeological survey of the FMC BRAC parcels will be complete. Phase II site evaluations are scheduled to begin in the summer of 1998. Following the completion of those studies Section 106 and 110 requirements for the inventory of significant archaeological sites for the BRAC parcels will be complete. Minor beneficial effects would be anticipated, if the ED Alternative is implemented. Application of the historical resources encumbrance (covenants) would result in a beneficial effect on cultural resources because transfer of property would have deed restrictions requiring future owners to protect NRHP eligible cultural resources. The covenants will describe processes for consulting with the State Historic Preservation Officer (SHPO) to arrive at mutually agreeable and appropriate measures for either protecting the properties or mitigating the adverse effects of a proposed undertaking.

- **Indirect.** Minor adverse effects would be anticipated if the ED Alternative is implemented. The new owners may in the future seek to lessen or remove the preservation deed restrictions from NRHP eligible properties, resulting in degradation or loss of these properties. If the properties cannot be preserved intact, the preservation deed restriction would require the new owner(s) to consult with the

Alabama SHPO to undertake recordation of the properties, in accordance with the Secretary of the Interior's standards for recordation and any applicable state standards. Such recordation would mitigate any potentially adverse effects to a minor level.

Unencumbered Disposal Alternative

- **Direct.** Long-term minor adverse effects would be expected. FMC NRHP eligible properties would be adversely effected by the withdrawal of federal protection. If FMC historic properties are disposed of without preservation covenants, the Army, Alabama SHPO and the Advisory Council on Historic Preservation (ACHP) will consult, in accordance with Section 106 of the National Historic Preservation Act (NHPA), to determine appropriate measures for treating the loss of these properties. Measures carried out as a result of these consultations would mitigate for the loss or alteration of these historic properties.

- **Indirect.** Long-term minor adverse effects would be associated with the potential degradation or loss of these FMC historic properties under the unencumbered alternative. As a result, people living near FMC would lose these components of their heritage. The adverse effects of the undertaking would be reduced to a minor level by implementing appropriate mitigation measures, which would be determined through Section 106 consultations between the Army, Alabama SHPO, and the ACHP.

5.3.13 Sociological Resources

Encumbered Disposal Alternative

- **Direct.** Short-term minor beneficial impacts to sociological resources would be expected as predisposal activities, such as infrastructure maintenance, security operations, and environmental remediation activities would result in job creation and spending in the local economy. However, such activities would have little or no impact on local housing, schools and public services. There would be no negative impact on environmental justice (minority and low-income populations), social service or other programs.

- **Indirect.** No indirect impacts to sociological resources would be expected, if the ED Alternative is implemented.

Unencumbered Disposal Alternative

- **Direct.** Long-term beneficial and short-term adverse impacts would be expected, if the UD Alternative is implemented. Removal of certain encumbrances could enhance the long-term economic value and development potential of the property. However, transfer of initially unencumbered property could result in more rapid property development and associated increases in population which could have adverse short-term impacts on local housing and public service resources. No negative impacts on environmental justice, social service and other programs would be expected.

- **Indirect.** No indirect impacts to sociological resources would be expected, if the UD Alternative is implemented.

5.3.14 Economic Development

Encumbered Disposal Alternative

- **Direct.** Long-term beneficial and adverse impacts to economic development would be expected, if the ED Alternative is implemented. The ED Alternative would allow development to occur earlier, which would benefit the local economy in the form of employment, income, business sales and tax revenues. However, certain encumbrances (i.e. environmental remediation areas, UXO removal / UXO land use restrictions, utilities interdependencies, wetlands) could prohibit certain land uses, decrease development potential, and reduce the desirability of the parcels for development, therein adversely impacting the above economic benefits from reuse of the property.

- **Indirect.** Short-term minor beneficial impacts would be expected, if the ED Alternative is implemented, as employment and income generated by predisposal activities could generate indirect employment in the local economy.

Unencumbered Disposal Alternative

- **Direct.** Short-and long-term beneficial and adverse impacts would be expected, if the UD Alternative is implemented. The additional time required for removal of encumbrances would cause a delay in property transfer. This would result in a subsequent delay in reuse and economic benefits in the form of employment, income, business sales and tax revenues. Additionally, the lack of inplace utility systems will detract from the ability to redevelop the area. However, upon removal of development encumbrances, the property could be available for a broader range of uses which could ultimately offer greater economic benefits to the local economy.

- **Indirect.** Long-term beneficial impacts would be expected as removal of encumbrances would result in indirect employment, income and business sales as a result of the initial economic development activity.

5.3.15 Quality of Life

Encumbered Disposal Alternative

- **Direct.** No direct impacts on quality of life would be expected, if the ED Alternative is implemented.

- **Indirect.** No indirect impacts on quality of life would be expected, if the ED Alternative is implemented.

Unencumbered Disposal Alternative

- **Direct.** No direct impacts on quality of life would be expected, if the UD Alternative is implemented.

- **Indirect.** No indirect impacts on quality of life would be expected, if the UD Alternative is implemented.

5.3.16 Installation Agreements

Encumbered Disposal Alternative

- **Direct.** No direct impacts on installation agreements would be expected, if the ED Alternative is implemented.

- **Indirect.** Minor adverse impacts would be expected, if the ED Alternative is implemented. The remedial activities encumbrances would necessitate the Army's maintenance of support agreements with local fire departments and emergency medical care providers to respond to emergencies concerning hazardous waste site remediation at the installation. These impacts would be economic in nature.

Unencumbered Disposal Alternative

- **Direct.** Minor adverse impacts would be expected, if the UD Alternative is implemented.

- **Indirect.** Completion of remedial actions prior to disposal would eliminate the need for continued agreements with local fire departments and emergency medical care providers.

5.3.17 Preferred Disposal Alternative

Based upon a review of the impacts described in the preceding subsections, it is concluded that implementation of the UD Alternative is not reasonable based upon the anticipated adverse environmental impacts and the interests of the Army. Therefore, implementation of the ED Alternative is the Army's Preferred Action. This action will result in disposal actions that are timely, support Army requirements, and are compatible with the FMDC Reuse Plan.

5.4 REUSE ALTERNATIVES

5.4.1 Introduction

Three reuse alternatives have been evaluated in this EIS for anticipated environmental consequences. These three alternatives are referenced as Medium Low Intensity Reuse (MLIR) Alternative, Medium Intensity Reuse (MIR) Alternative, and Medium High Intensity Reuse (MHIR) Alternative. As noted in subsection 3.4, these reuse alternatives do not attempt to predict the exact nature or pattern of reuse activities that will ultimately occur at FMC. The alternatives are useful in identifying likely activities and the range of associated impacts that would be expected to occur under various levels of reuse intensity.

Subsections 5.4.2 through 5.4.16 identify the environmental consequences of these reuse alternatives. The reuse alternatives are evaluated based on the assumption that the Army would implement its preferred alternative, encumbered disposal. Reuse of the FMC excess area (approximately 17,360 acres), is proposed to involve multiple uses, as documented in the FMDC Plan. Much of the eastern one-half of FMC will remain open space whereas the western portions, including the existing cantonment area, will be reused for a variety of uses including: residential, industrial, retirement, retreat, commercial, mixed-use, retail, recreational, and open space.

As detailed in subsection 3.4.4, the three reuse alternatives are based upon the FMDC's Preferred Land Use Plan. Reuse of former FMC lands is not an Army action, but is a reasonably foreseeable future action of others; consequently, the Army does not select a preferred reuse alternative. Selection of a preferred reuse development plan will be made by the FMDC in conjunction with the local Calhoun County community. It is anticipated that FMDC would prefer to implement the MHIR Alternative, as this alternative encompasses many of the same elements and intensities as the FMDC's Preferred Land Use Plan. Nevertheless, the EIS provides the Army Decision Maker a range of reuse alternatives and their associated environmental effects, to assist in the review of potential encumbrances the Army may desire to place on future reuse in order to meet regulatory requirements, and to protect human health and the environment. In the following subsections, the direct and indirect impacts of the three reuse (MHIR, MIR, and MLIR) alternatives are presented. Full build-out of any of the implementation alternatives could occur over a 20-year time frame.

5.4.2 Land Use

Medium High Intensity Reuse Alternative

- **Direct.** Under the MHIR Alternative, adverse impacts to land use can be expected as the disposal area would be developed more intensely than under baseline conditions. The total square footage of built floor space would increase to approximately 9 million square feet (including residential) from the approximately 6 million square feet currently existing. A concurrent increase in floor area ratio (FAR) would also occur. Additionally, employee density would increase to approximately 500 square feet/employee from the existing 700 square feet/employee, allowing more people to work within the same area. Some areas currently left in open space or very low intensity uses would be converted to more intense land use types, such as residential, commercial and industrial uses. Proposed land use under the MHIR Alternative and other reuse alternatives is compatible with adjacent zoning in the City of Anniston.

- **Indirect.** Development of the reuse area, as specified in this reuse alternative, could adversely affect potential land use and development elsewhere within the region. Larger scale residential, commercial and industrial construction in the reuse area could result in postponing or cancelling new development elsewhere, and/or the relocation of existing businesses to the reuse area.

Medium Intensity Reuse Alternative

- **Direct.** Under this alternative, adverse impacts would occur as a result of more intense development of the disposal area relative to baseline conditions. Total built floor space would increase to approximately 7.3 million square feet with an average employee density of 650 square feet/employee. Other impacts would be similar to those under MHIR Alternative, but of a lesser magnitude.

- **Indirect.** Indirect impacts associated with implementing this alternative would be similar to those under the MHIR Alternative.

Medium-Low Intensity Reuse Alternative

- **Direct.** No direct adverse impacts would occur, as a result of implementing the MLIR Alternative, as the amount of built floor space would increase by only approximately 335,000 square feet over baseline conditions. Total built floor space would increase to approximately 6.3 million square feet with an average employee density of 800 square feet/employee. Some currently available open areas would be developed, but at a low intensity.

- **Indirect.** No indirect impacts to land use would be expected from implementation of the MLIR Alternative.

5.4.3 Air Quality

As discussed in subsection 4.3, the region including FMC is currently an attainment area for established National Ambient Air Quality Standards (NAAQS) air pollutants. All air emission sources must comply with USEPA Clean Air Act and ADEM regulations regardless if the source is federally, publicly, or privately owned.

New industrial sources would likely increase air emissions in the Air Quality Control Region. Because no specific industrial use proposals have been identified, it is not possible to reasonably estimate the quantities of these emissions, nor predict the ambient air impacts. It is unlikely that there would be any significant adverse impacts on air quality (NAAQS exceedances) as a result of these new activities because the operators of any new emission sources would be required to comply with all applicable Federal and state air quality regulations, including prevention of significant deterioration (PSD) regulations. These regulations include a requirement to obtain applicable permits that possibly specify emission limits and control technology. These regulations are designed to be protective of the environment and are meant to prevent an attainment area becoming a nonattainment area.

Activities which can reasonably be estimated for the Disposal and Reuse of the Fort McClellan area include mobile sources, fugitive particulate matter from construction, and construction equipment emissions. Appendix G contains the detailed air emissions calculations along with the assumptions.

It should be noted that the NAAQS for particulate matter and ozone are being revised (as previously discussed in subsection 4.3). The proposal for particulate matter includes adding a category of 2.5 microns or less (PM2.5) to the current category of 10 microns or less (PM10). On July 16, 1997 USEPA administrator Carol M. Browner announced the revised standards for ozone and particulate matter. President Bill Clinton, also on July 16, 1997, signed a memorandum approving the issuance of the new air quality standards and directing the USEPA to complete their rulemaking by December 31, 1998. The President did, however, make some slight modifications to the revised standards and added a transitional period for implementing the standards. The new standards will not require local controls until 2004 for ozone and 2005 for particulate matter, with no compliance determinations until 2007 and 2008, respectively, and with possible extensions. Because the new standard would regulate fine particulates for the first time, USEPA will allow five years to build a nationwide monitoring network, and to gather and analyze the data needed to designate areas and develop implementation plans.

A preliminary analysis conducted by USEPA indicates that Calhoun County will remain an attainment area for ozone and particulate matter with the revised standards, although there is uncertainty in this preliminary analysis. EPA's preliminary analysis was based on existing ambient air monitoring data, if available, and does not estimate the impacts of additional air emission sources.

Medium-High Intensity Reuse Alternative

- **Direct.** Implementation of the MHIR Alternative would be expected to add various emission sources associated with industrial operations and construction activity. These emissions would replace Army activities that previously included sources such as boilers, generators, paint spray booths, fuel storage and dispensing, degreasing, and other miscellaneous sources. It is anticipated that there would be an overall net increase in emissions. Prescribed burning would be reduced by approximately 165 acres per year (see Appendix G).

  Once the reuse areas are occupied by the various residential, commercial, and industrial tenants, an increase in vehicle traffic would generate additional mobile source emissions in the region. The anticipated change in vehicle emissions was calculated as the primary indicator of air quality impacts resulting from the land reuse because there are no specific industrial use proposals at this time. The analysis focused on the projected traffic, and subsequent emissions, for the region. The results of the emission modeling define the changes as indicated by the vehicle activity on installation roadways as predicted for MHIR, MIR, and MLIR alternatives. The emissions modeling indicates that under the MHIR Alternative (as well as the MIR and MLIR alternatives), a significant adverse impact will result from the increased levels of carbon monoxide (CO) and nitrogen oxides (NOx) directly associated with the emissions from the increased traffic volume, which is estimated to increase approximately 200 percent (see Table 5.3). The adverse impacts to air quality are based upon the projected traffic increase associated with redevelopment. Improvements in the road system envisioned in the FMDC reuse plan may potentially serve to lessen the projected impacts on air quality (see subsection 5.6.3).

  Mobile source emissions were calculated using the USEPA approved Mobile 5b computer model which generates emission factors in grams per mile. Mobile 5b will estimate emission factors for three parameters: carbon monoxide (CO), nitrogen oxide (NOx), and volatile organic compounds (VOCs). These emission factors are then multiplied by the vehicle miles traveled to obtain overall air emissions. Vehicle miles traveled were determined based on the average daily trips. Although a mobile source emissions inventory has not been conducted at FMC, the baseline number of trips per day established was 29,375 for the MHIR. Implementation of this alternative is predicted to increase the number of trips per day to 87,750, or an increase of 58,375 trips per day over baseline conditions. The estimated increase in mobile source emissions is provided in Table 5.1. The assumptions and detailed calculations for determining mobile source emissions are provided in Appendix G.

  Construction activities not only include the physical construction of the structure, but also the site development. Particulate matter is emitted during construction activities not only as a result from earth moving equipment and unpaved road emissions, but also with the actual construction of structures. Emissions can be associated with other construction activities such as land clearing, drilling and blasting, ground excavation, and cut and fill operations. Dust emissions can vary from day to day varying on the type of operations, level of activity, and meteorological conditions. Any potential air impacts from construction activities are considered to be short-term because the construction is short duration. Construction activities would also create temporary sources of vehicle/equipment exhaust emissions. Both the dust emissions and construction equipment exhaust emissions associated with construction are temporary and primarily confined to the immediate construction area.

Particulate matter will be emitted into the air during construction activities although particulate from construction is generally large in diameter and is not expected to travel very far because of the particle size. The quantity of emissions is proportional to the area of land being developed and the level of construction activity. Dust emissions have a temporary impact on local air quality because construction is usually considered a nonrecurring activity. Table 5.1 summarizes the emissions associated with construction activities. The assumptions and detailed calculations for determining construction emissions are provided in Appendix G.

The analysis assumes 2,818 acres of disturbed area for MHIR Alternative. Construction related emissions would not be expected to create any significant ambient air quality impacts due to the relatively small quantities of these emissions and the dispersed locations of the construction sites.

Occasional emissions of hazardous air pollutants could also occur under this scenario depending on the type of industrial reuse. Examples of common industrial products classified as hazardous air pollutants include certain pesticides, chlorine, several types of solvents, and a variety of petroleum products. These chemicals, as well as several others that are often used during industrial operations, can be harmful to human health and the environment if released at excessive concentrations. It is difficult to predict the extent to which chemicals would be used under reuse without knowing the types of industries expected to locate in the area. The use of chemicals is highly regulated, however, controlled emissions associated with MHIR Alternative would not be expected to significantly affect air quality.

- **Indirect.** There is the potential for increased ground level ozone formation due to the significant increase in mobile source emissions. Ozone formation is a complex, photochemical set of reactions and there is not a reliable method to predict local point source impacts to ozone formation. Other indirect impacts include the potential for visible particulate matter down wind of the construction activities.

Medium Intensity Reuse Alternative

- **Direct.** This plan has the same amount of land in comparison to MHIR Alternative, but the intensity for reuse is reduced. As a result, the quantity of new stationary air sources to relocate in the area is reduced. The quantity of overall air emissions associated with this alternative would be slightly less than MHIR Alternative. The emissions modeling indicates that under the MIR Alternative, a significant adverse impact will result from the increased levels of carbon monoxide (CO) and nitrogen oxides (NOx) directly associated with the emissions from the increased traffic volume, which is estimated to increase approximately 100 percent (see Table 5.3). Considerations relevant to MHIR Alternative would apply but at a reduced intensity. Prescribed burning would be reduced by approximately 165 acres per year (see Appendix G). Construction emissions would also be reduced because the intensity of development is reduced compared to MHIR Alternative. The average daily trips are approximately 68% of MHIR Alternative, primarily as a result of the decreased intensity for development. Although a mobile source emissions inventory has not been conducted at FMC, the baseline number of trips per day established was 29,375 for the MIR. Implementation of this alternative is predicted to increase the number of trips per day to 59,800, or an increase of 30,425 trips per day over baseline conditions. Table 5.1 presents the estimated increase in vehicle emissions that would result under the MIR Alternative. These estimates are based on fewer daily trips compared to MHIR Alternative.

- **Indirect.** The indirect impacts associated with this land use plan would be similar to those described under MHIR Alternative, but at a reduced level. Ozone formation would be reduced primarily due to less vehicle traffic.

Medium-Low Intensity Reuse Alternative

- **Direct.** This plan has the same amount of land in comparison to MHIR and MIR alternatives, but the intensity for reuse is reduced. As a result, the quantity of new stationary air sources to relocate in the area is reduced. The quantity of overall air emissions associated with this alternative would be less than both the MHIR and MIR alternative plans. The emissions modeling indicates that under the MLIR Alternative, a significant adverse impact will result from the increased levels of nitrogen oxides (NOx), directly associated with the emissions from the increased traffic volume, which is estimated to increase approximately 50 percent (see Table 5.3). Considerations relevant to the other plans would apply but at a reduced intensity. There would not be any prescribed burning associated with this reuse plan (see Appendix G). Construction emissions would also be reduced because the intensity of development is reduced. The average daily trips are approximately 50% of MHIR Alternative. Although a mobile source emissions inventory has not been conducted at FMC, the baseline number of trips per day established was 29,375 for the MLIR. Implementation of this alternative is predicted to increase the number of trips per day to 44,150, or an increase of 14,775 trips per day over baseline conditions. Table 5.1 presents the estimated increase in vehicle emissions that would result under MLIR Alternative. These estimates are based on fewer daily trips compared to the MHIR Alternative.

Table 5.1 Estimated Increase in Air Emissions for all Reuse Alternatives at Fort McClellan

Source	Criteria Pollutants (tons per year)				
	PM-10	SO_X	CO	NO_X	VOC
Medium-High Intensity Reuse Alternative					
Mobile Sources [1]	NC	NC	2,878	228	282
Construction Dust	8.5	NA	NA	NA	NA
Construction Equipment	7.5	9.6	37.6	85.9	9.0
Total Increase	16.0	9.6	2,915.6	313.9	291.0
Medium Intensity Reuse Alternative					
Mobile Sources [1]	NC	NC	1,500	119	147
Construction Dust	8.5	NA	NA	NA	NA
Construction Equipment	6.9	8.8	34.8	79.1	8.3
Total Increase	15.4	8.8	1,534.8	198.1	155.3
Medium-Low Intensity Reuse Alternative					
Mobile Sources [1]	NC	NC	728	58	71
Construction Dust	8.5	NA	NA	NA	NA
Construction Equipment	6.5	8.4	33.1	75.2	7.9
Total Increase	15.0	8.4	761.1	133.2	78.9

Notes: 1) Mobile source calculations are based on USEPA Mobile 5b model using 19.6 miles per hour and vehicular traffic based upon proposed land use development and associated trips (See Appendix G for detailed calculations).
2) Mobile source baseline data is presented in subsection 4.3.2. Construction dust and equipment increases are based upon additional anticipated construction associated with redevelopment activities.

PM-10 = Particulate Matter less than or equal to 10 micrometers in diameter
SO_X = Sulfur Oxides NOx = Nitrogen Oxides VOC = Volatile Organic Compound
NA = Not Applicable NC = No Change

Source: Parsons Engineering Science, Inc.

- **Indirect.** The indirect impacts associated with this land use plan would be similar to those described

under MIR Alternative, but at a reduced level. Ozone formation would be reduced primarily due to less vehicle traffic.

5.4.4 Noise

Medium-High Intensity Reuse Alternative

- **Direct.** Both beneficial and adverse impacts are expected from implementation of the MHIR Alternative. Overall, beneficial impacts are expected as there will be a reduction in baseline noise levels associated with the cessation of training activities at FMC Main Post. However, minor adverse impacts would be expected, associated with the new industrial activities that would locate in the planned Industrial Areas. New industries could use equipment that would produce noise, thereby affecting adjacent areas. This would primarily be of concern to residents of the proposed residential and retirement areas. The potential for localized noise problems would depend on what industries would actually locate in the area and the distance between these noise sources and the nearest housing. The open spaces proposed for the area and the distance between the industrial and residential areas would be expected to minimize the potential for noise-related land use compatibility problems.

- **Indirect.** Minor indirect adverse impacts would be expected from implementation of the MHIR Alternative. Short-term adverse impacts on the noise environment would be created as a result of construction of new buildings/roads and the demolition of some existing buildings/roads. Construction noise is not considered a significant impact, however, because it would be localized and temporary, and would most likely occur only during daylight hours.

  Traffic generated by reuse activities (over 7.1 million square feet of built non-residential space) and travel by employee population, estimated to exceed 13,500 persons would have long-term affects on the noise environment. Noise from traffic would be most noticeable in the vicinity of the proposed parkway, as well as the proposed truck route and existing Highway 21. The parkway buffer area and the establishment of a separate truck route distant from residential areas would be expected to minimize the potential for noise-related land use compatibility problems.

Medium Intensity Reuse Alternative

- **Direct.** Minor direct adverse impacts would be expected from implementation of the MIR Alternative. Use of 5.8 million square feet of built non-residential space and an employee work force of approximate 8,900 persons would pose less potential for noise than MHIR Alternative.

- **Indirect.** Minor indirect adverse impacts would be expected from implementation of the MIR Alternative. The amount of construction or renovation attributable to 8,900 employees would pose less potential for noise than MHIR Alternative.

Medium-Low Intensity Reuse Alternative

- **Direct.** Minor direct adverse impacts would be expected from implementation of the MLIR Alternative. Considerations relevant to MIR would apply to the less intense MLIR Alternative. Use of 4.8 million square feet of built non-residential space and an employee work force of approximately 6,000 persons would pose less potential for noise than MHIR or MIR alternatives.

- **Indirect.** Minor adverse impacts would be expected. Considerations relevant to MIR Alternative would apply to the less intense MLIR Alternative. The amount of construction or renovation attributable to 6,000 employees would pose less potential for noise than MHIR or MIR alternatives.

5.4.5 Water Resources

5.4.5.1 Surface Water

Medium-High Intensity Reuse Alternative

- **Direct.** Implementation of MHIR Alternative would result in a long-term direct adverse impact to surface water. The development of currently undeveloped areas under the reuse plan would increase the amount of area with an impervious surface, associated with new buildings, roads, and parking lots. The development of 924 acres for industrial use will result in a total of 415 acres with an impervious surface (45% of the MHIR Alternative industrial acreage). Retirement, residential and retail land uses will each add 100 or more acres with an impervious surface. The total amount of impervious surface under the MHIR Alternative is approximately 1,009 acres. The impact of the additional impervious surface is to increase the peak surface water flow following storm events. Adverse impacts associated with increased stormwater runoff may be reduced if appropriate and effective new stormwater control systems are installed as part of the redevelopment action.

- **Indirect.** Implementation of MHIR Alternative will result in a long-term indirect adverse impact to surface water. The greater amount of vehicular traffic as well as the large number of parking areas associated with this development will result in a higher potential for contaminants such as oils, fuels and lubricants to be carried off of the roadways and parking lots to surface water. Over 87,000 vehicular trips per day are estimated under this alternative. The contaminants in the runoff could cause a minor adverse impact to water quality of the wetlands that are located within the areas to be developed in the disposal area. The loss of natural or existing vegetation in the areas to be developed will lead to increases in runoff. Filling and clearing of land as well as regrading operation in the wetlands would required Section 404 permits under the Clean Water Act. These permits would outline specific mitigation requirements to protect or replace the wetlands.

Medium Intensity Reuse Alternative

- **Direct.** Implementation of MIR Alternative will result in the same types of impacts described above for MHIR Alternative. The magnitude of the impact will be reduced due to the lower level of intensity of the reuse. The difference in the area with an impervious surface is slightly less than under the MHIR Alternative. As a result, the difference in the direct impact from MHIR Alternative is minimal.

- **Indirect.** The implementation of MIR Alternative will result in a slight long-term indirect adverse impact to surface water. The potential for contaminants to run off of roadways and parking lots and to enter the surface water system will be lower under this scenario than under MHIR Alternative. The lower intensity of the reuse will result in approximately 58,000 vehicular trips per day compared to over 87,000 under MHIR Alternative. The more limited public access to the passive recreation areas would result in a slightly lowered rate of surface water runoff.

Medium-Low Intensity Reuse Alternative

- **Direct.** The area with an impervious surface is less than either the MHIR or MIR alternatives; consequently, the magnitude of the long-term direct adverse impact to surface water related to increased run off will be lower than under either MHIR or MIR alternatives.

- **Indirect.** The potential for a long-term indirect adverse impact identified related to runoff of contaminants from parking lots and roadways will be much lower compared to MHIR Alternative. The estimated number of vehicular trips per day under this scenario is approximately half the number estimated for MHIR Alternative. The adverse, indirect impact of the implementation of this scenario on surface water will be proportionally less. A minor beneficial impact may result from lowered runoff from the passive recreation areas as the areas slowly revert to natural conditions of vegetative cover.

5.4.5.2 Floodplains

Medium-High Intensity Reuse Alternative

- **Direct.** Minor direct long-term adverse impacts will occur to the floodplains as a result of implementing the MHIR Alternative reuse plan. A small portion of the industrial, retail, retirement and residential development planned could occur within the floodplains. This development would require floodproofing, construction of raised buildings, or levees. Extensive development within the floodplains is not expected to occur, any development that does occur will need to adhere to EO 11988 to avoid adverse effects and incompatible development. The magnitude of this impact would be very slight.

- **Indirect.** Minor indirect short-term adverse impacts will occur to the floodplains as a result of implementing the MHIR Alternative. Increased erosion resulting from construction activities could lead to localized sedimentation within the floodplain. Although the impact could be important at any given location, the impact would, in general, be slight.

Medium Intensity Reuse Alternative

- **Direct.** The impacts to floodplains, associated with implementation of the MIR Alternative, would be similar to those described above for MHIR Alternative. The magnitude of the potential impact would be lower than the very slight impact noted for MHIR Alternative.

- **Indirect.** The potential for indirect impacts to floodplains from sedimentation would be insignificant if the MIR Alternative is implemented. Moderate sedimentation would be limited in extent under this alternative.

Medium-Low Intensity Reuse Alternative

- **Direct.** Only an insignificant direct adverse impact to floodplains would be expected if the MLIR Alternative is implemented. Under this alternative, little development within the floodplains would be expected to occur.

- **Indirect.** The potential for indirect impacts to floodplains from sedimentation would be insignificant if the MLIR Alternative is implemented.

5.4.5.3 Groundwater

Medium-High Intensity Reuse Alternative

- **Direct.** Implementation of MHIR Alternative will have a minor long-term adverse impact on groundwater if the MHIR Alternative is implemented. The development of 924 acres for industrial use will result in a total of 415 acres with an impervious surface (45% of the MHIR Alternative industrial acreage). Retirement, residential and retail land uses will each add 100 or more acres with an impervious surface. Under this scenario the total area with an impervious surface will be approximately 1,009 acres. Infiltration of precipitation does not occur with an impervious surface, resulting in a reduction in the amount of recharge to the groundwater system. Recharge to the groundwater system varies widely over the area. The areas most likely to have an impervious surface are in the topographically lower areas that would be expected to be discharge areas rather than recharge areas.
- **Indirect.** Implementation of the MHIR Alternative will have an indirect adverse, long-term impact on groundwater. Some of the runoff from parking lots and roadways constructed to support the development of large quantities of industrial, commercial, office and retail space may infiltrate to groundwater. This runoff may contain trace amounts of lubricants, fuels, antifreeze, deicing salts and other contaminants that could degrade the quality of the groundwater. It is anticipated that over

87,000 vehicular trips a day will be generated under the MHIR Alternative. Tables 5.3 and 5.4 (in subsection 5.4.7.3) contain additional information concerning the calculation of these vehicular trips. The approximately 71,000 vehicle trip net increase in traffic and use of parking lots, over baseline conditions, will increase the potential loading of contaminants to groundwater.

Medium Intensity Reuse Alternative

- **Direct.** Implementation of MIR Alternative will result in similar types of direct long-term impacts on groundwater as described for MHIR Alternative. The only difference will be a slight decrease in the amount of area with an impervious surface. The difference in the magnitude of potential impact associated with implementation of the MHIR Alternative will be minor.

- **Indirect.** Implementation of MIR Alternative will result in the potential for an adverse indirect long-term impact to groundwater. The mechanism for the impact is the same as described for MHIR Alternative. Just under 60,000 vehicular trips is estimated for this scenario compared to over 87,000 under MHIR Alternative. As delineated on Tables 5.3 and 5.4 (in subsection 5.4.7.3) implementation of this alternative will result in an approximately 43,000 vehicle trip net increase over baseline conditions.

Medium-Low Intensity Reuse Alternative

- **Direct.** Implementation of MLIR Alternative will have a slight direct, long-term adverse impact on groundwater. The amount of impervious surface, which limits infiltration of precipitation to groundwater is lower under this scenario compared to either the MHIR Alternative or the MIR Alternative, limiting the magnitude of the impact.

- **Indirect.** The potential indirect long-term adverse impact to groundwater from infiltration of water carrying contaminants that have run off of the roadways and parking lots is minor. The lower potential for an impact is based on the lower number of vehicular trips expected under this reuse intensity. As illustrated on Table 5.3 and 5.4 (subsections 5.4.7.3), implementation of the MLIR Alternative will result in the generation of approximately 27,000 additional vehicle trips when compared to baseline conditions.

5.4.6 Geology

Medium-High Intensity Reuse Alternative

- **Direct.** The implementation of MHIR Alternative will result in both long- and short-term adverse impacts to soil and geology. The implementation of MHIR Alternative would result in the development of residential, industrial and commercial land uses in areas that are currently undeveloped. Approximately 16 percent of the disposal area would be developed for residential and retirement use. Most of this area would be cleared to make way for the development. Some of the area that would be used for this development has been previously developed for other land uses. At least some of the area used for residential development would be in areas not previously developed. Areas with steep slopes and erodible soils would be most susceptible to adverse impacts.

  Clearing and grading activities associated with the development activities described above will result in the increased potential for soil erosion as a part of the construction process. The amount of erosion that occurs can be reduced through the use of soil erosion control practices. The greatest impacts of the increased potential for soil erosion will be short-term as long as vegetation is reestablished and maintained in the impacted areas. The minimization of soil erosion and the re-establishment of vegetation in disturbed soils areas is an important consideration. Should redevelopment activities result in the exposure of infertile, highly mineralized soils (e.g. sulfide minerals), revegetation will be difficult and erosion related impacts would increase.

Maintenance of the grounds developed may result in the application of larger amounts of fertilizer and pesticides to lawns and landscaped areas. The fertilizer and pesticides could build up in the soil. This could result in a slight degradation of soil quality.

- **Indirect.** Implementation of MHIR Alternative will also result in an indirect long-term adverse impacts to soil and geology. Runoff from the additional roadways and parking lots associated with the reuse could contain small amounts of petroleum, lubricants and deicing solutions. These constituents could accumulate in soils. The additional runoff generated as a result of the increased area with an impervious surface could cause local erosion and sedimentation. Over the entire disposal area, these impacts are relatively minor. However, the degree of impact will vary with location.

Medium Intensity Reuse Alternative

- **Direct.** Implementation of MIR Alternative will create the same types of long-term and short-term direct impacts to soil and geology as noted in the subsection above. The magnitude of the impact will be reduced based on the lowered intensity of the reuse. With the lowered reuse intensity, it is likely that the reuse will be directed to the more easily developed portions of the subject area. This may result in a lower magnitude of impact.

- **Indirect.** The indirect impacts to soil and geology will be similar to those identified for MHIR Alternative. The magnitude of the impacts will be reduced based on the lower intensity of the reuse. The limited access of the public to the passive recreation areas may lead to a marginally lower rate of soil erosion.

Medium-Low Intensity Reuse Alternative

- **Direct.** Implementation of MLIR Alternative will create only slight direct impacts to soils and geology. The lowered intensity of the reuse will result in lesser impacts. The types of impacts expected would be similar in type to those described for MHIR Alternative, however the magnitude would be reduced.

- **Indirect.** Implementation of MLIR Alternative will create minor indirect, long-term adverse impacts to soils and geology. The types of impacts expected would be similar to those described for MHIR Alternative. However, the reduced intensity of the reuse will result in only minor impacts. Soil erosion in the passive recreation areas may be slightly reduced as the natural vegetative cover slowly reestablishes itself. The magnitude of this change is likely to be minimal.

5.4.7 Infrastructure

5.4.7.1 Utilities Once transfer of the major utilities has occurred in an encumbered condition, the responsibility for maintenance, repairs, and improvements will become the responsibility of the new utility provider. For the purposes of this analysis, it is assumed that the condition and configuration of the utilities at the time of transfer will be as described in subsection 4.7. The steam plants and communication systems will not be affected by the reuse intensity as a result of disposal beyond what has been described in subsection 5.3.7.1.

The major components of the utility system can be evaluated for their capacity to serve the effective population. Effective population (EP) is the population of the installation based on the amount of time each person spends on-post: personnel that live on-post count as one effective population based upon an assumed use of the utility systems for 24 hours per day, while personnel that work on-post but live off-post count as one-third effective population base upon an assumed use of the utility system for only 8 hours per day. The effective population for each reuse intensity is indicated in Table 5.2.

Table 5.2 FMC Effective Population

Reuse Intensity	Residential Population	Employee Population	Effective Population [1]

MHIR Alternative	3,665	13,989	8,328
MIR Alternative	2,894	8,992	5,892
MLIR Alternative	2,600	6,052	4,618
FMC Baseline Population[2]	5,351	4,405	6,819

Notes: 1 Effective population = one residential population + one-third employee population
2 Residential Population includes 3,160 trainees and students (see Table 4.23)

Source: Parsons Engineering Science, Inc

Medium-High Intensity Reuse Alternative

The industrial development north of the existing cantonment area and the retail, retirement community and retreat developments south of the cantonment area would require that utility services be extended beyond areas served by the current utility configuration. Parcels identified for industrial development may require more service capacity given the increased reuse intensity. The anticipated effective population for MHIR Alternative is 8,328.

- **Direct.** Implementation of the MHIR Alternative would result in utility demands which would require additions, expansions and extensions of existing utility systems, thereby resulting in an adverse impact. The alterations will involve reconfiguration of the distribution and collection systems, and adjustments to meet the increased utility demands at some parcels.

  Even though parcels within the existing cantonment area have existing utility services in place, re-configuration of these systems and new service connections will be necessary. Parcels planned for development outside the existing cantonment area, are not currently served by utilities and would therefore require construction of new utility distribution and collection systems.

  The new utility providers will be responsible for providing the capacity to meet the service demands. The existing 1,500 gallons per minute (gpm) pumps at Summerall and Baltzell Gates and the existing water mains should have adequate capacity to meet any anticipated increased demands. Since the existing underground water storage tank is not in service, additional water storage capacity will likely be necessary for the expanded development.

  Additional substations may be necessary in addition to expanding the distribution systems to meet the demands for electricity. Expanding the distribution system is likely all that would be required on site to satisfy the need for additional natural gas. These expansions and extensions should be feasible without causing an adverse impact to the environment.

  Sewers would have to be reconfigured, extended and upgraded to provide the capacity anticipated. The wastewater treatment plant's capacity of 2.2 million gallons per day (mgd) should be sufficient to handle the anticipated discharge. Peak flows experienced during rainfall events could be reduced by correcting the infiltration and inflow problems experienced within the collection system at FMC (see subsection 4.7). Depending on the types of industries located on the excess property, the existing wastewater treatment plant may not be adequate to sufficiently treat the new industrial wastewater discharges. If this is the case, the wastewater treatment facilities may have to be expanded or modified.

- **Indirect.** There would be a number of short-term adverse impacts associated with the construction of new utility components. These indirect impacts would include those normally associated with the development process including soil disturbance, erosion, siltation of local surface water resources, loss of plant resources and possible loss of wildlife habitat.

Medium Intensity Reuse Alternative

As described above for MHIR Alternative, previously undeveloped areas are identified for use and portions of the existing cantonment area are identified for more intense reuse. The anticipated effective population for MIR Alternative is 5,892.

- **Direct.** Although the effective population is lower than for MHIR Alternative, similar impact as described above would be expected. Utility demands would require additions, expansions and extensions of existing utility systems resulting in an adverse impact.

  The alterations will involve reconfiguration of the distribution and collection systems as described above for the MHIR Alternative. The utility demand would be less than for MHIR Alternative, but additional water storage capacity would still be required.

- **Indirect.** Short-term adverse impacts would be expected as a result of the construction associated with development as described above for MHIR Alternative.

Medium-Low Intensity Reuse Alternative

As described above for MHIR Alternative, previously undeveloped areas are identified for use and portions of the existing cantonment area are identified for more intense reuse. The anticipated effective population for MLIR Alternative is 4,618.

- **Direct.** Although the effective population is lower than for MHIR Alternative, similar impacts as described above would be expected. Utility demands would still require additions, expansions and extensions of existing utility systems resulting in an adverse impact.

  The alterations will involve reconfiguration of the distribution and collection systems as described above for MHIR Alternative. The utility demand would be less than for MIR Alternative, but additional water storage capacity would still be required.

- **Indirect.** Short-term adverse impacts would be expected as a result of the construction associated with development as described above for MHIR Alternative.

5.4.7.2 Solid Waste

Medium-High Intensity Reuse Alternative

- **Direct.** The effective population anticipated following implementation of this alternative is similar to the current effective population at FMC. Therefore, the amount of solid waste generated would not be expected to substantially increase, and no adverse impact would be expected. The amount of solid waste generated could increase as a result of the type of industries located on the installation following redevelopment. An increase in the amount of solid waste generated could cause an adverse impact to the environment.
- **Indirect.** An increase in the amount of solid waste generated would be expected to have an adverse impact on the regional waste disposal facilities.

Medium Intensity Reuse Alternative

- **Direct.** Based on the anticipated effective population being less than the current effective population, if this alternative is implemented, the amount of solid waste generated would be expected to decrease. However, if the amount of solid waste generated increased, as a result of the type of industries located on the installation following redevelopment, an increase in the amount of solid waste generated could cause an adverse impact to the environment.

- **Indirect.** If the amount of solid waste generated increases under the MIR Alternative, there would be

an adverse impact on the regional waste disposal facilities.

Medium-Low Intensity Reuse Alternative

- **Direct.** Based on the anticipated effective population being less than the current effective population, if this alternative is implemented, the amount of solid waste generated would be expected to decrease. However, the amount of solid waste generated could increase depending on the type of industries located on the installation following redevelopment. An increase in the amount of solid waste generated could cause an adverse impact to the environment.

- **Indirect.** An increase in the amount of solid waste generated would be expected to have an adverse impact on the regional waste disposal facilities.

5.4.7.3 Transportation System

Additional traffic generated as a result of reuse of the disposal area would impact the local and regional roadway system. Estimated traffic projections under the three alternative reuse alternatives reflect total build-out scenarios, under which expansion of the existing roadway system capacity would be necessary. Table 5.3 summarizes estimated trip generation associated with the three reuse alternatives. Currently, eastern and western by-passes are programmed for construction, which would alleviate the current heavy volume of traffic on State Route 21 and enhance north/south movement of traffic through Anniston and adjacent areas. Both of these by-passes are planned to extend from I-20 northward to US Highway 431 and State Route 21 west of FMC.

Medium-High Intensity Reuse Alternative

- **Direct.** Significant adverse impacts would be expected under this implementation alternative. Table 5.3 summarizes estimated daily trip generation associated with the three reuse alternatives as compared to daily traffic generation under baseline conditions. MHIR Alternative would generate an estimated 87,750 total average daily vehicle trips (ADT) compared to 29,375 under baseline conditions. Under all alternatives it is estimated that 80 percent of the trips would be external, or those which enter or leave the reuse area from/to another destination. The estimated number of external trips would increase by 200 percent over baseline conditions.

Table 5.3 Summary of Trip Generation Estimates by Reuse Alternative [1]

Land Use Type	MHIR Alternative		MIR Alternative		MLIR Alternative	
	Amount of Development	Total Daily Vehicular Trips	Amount of Development	Total Daily Vehicular Trips	Amount of Development	Total Daily Vehicular Trips
Retail	228 acres	27,600	228 acres	18,700	228 acres	14,700
Office	116 acres	14,200	116 acres	7,800	116 acres	4,600
Office, Research & Dvlp.	25 acres	2,000	25 acres	1,600	25 acres	1,100
Residential	515 units	3,600	398 units	2,800	300 units	2,100
Residential (Retirement)	1,060 units	3,700	850 units	3,000	850 units	3,000
Industrial	924 acres	25,000	924 acres	17,200	924 acres	11,900
Education, Training	202 acres	8,700	202 acres	5,300	202 acres	3,800
Active Recreation	771 acres	1,800	771 acres	1,800	771 acres	1,800
Lagarde Park	150 acres	350	150 acres	350	150 acres	350

Expansion						
Yahoo Retreat	350 acres	800	350 acres	800	350 acres	800
Total Trips - Total (E & I)		***87,750***		***59,800***		***44,150***
External Trips		*70,200*		*47,840*		*35,320*
Internal Trips[2]		*17,550*		*11,960*		*8,830*
Less Baseline Total Trips		***29,375***		***29,375***		***29,375***
Baseline External Trips		**23,500**		**23,500**		**23,500**
Baseline Internal Trips[2]		**5,875**		**5,875**		**5,875**
Net Additional Total Trips[3]		**58,375**		**30,425**		**14,775**
Net Additional External Trips		**46,700**		**24,340**		**11,820**
Net Additional Internal Trips		**11,675**		**6,085**		**2,955**

Notes: 1 Trip generation rates are based primarily on average rates from Institute of Transportation Engineers (1991). See Appendix G for detailed calculations.
2 Trips which occur only within the reuse area and which are assumed to be 20 percent of total trips generated.
3 Equal to total average daily vehicle trips generated less baseline ADT of 29,375.

SOURCE: Parsons Engineering Science, 1997

Table 5.4 summarizes the estimated future daily traffic distribution resulting under each of the three reuse alternatives. Traffic distribution is indicated under both scenarios of "with" and "without" the by-pass improvements. Without the by-pass improvements, the existing traffic volumes on State Route 21 between US Highway 431 and State Route 202 would increase by 60 percent under MHIR. This portion and other segments of State Route 21 are already operating at an E and F level-of-service (LOS). Level-of-service is a qualitative measure used by the highway transportation profession to describe operational conditions of a road in terms of speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Six levels-of-service are defined, ranging from LOS "A', which represents the best operating conditions, to LOS "F", which represents the worst operating conditions. A LOS "D" consists of a high density traffic flow with speed and maneuverability restrictions, while a LOS "E" represents unstable traffic flow with the road at or near capacity. However, it is estimated that 50 to 60 percent of the additional traffic volume would be removed from State Route 21 under the "with" by-pass scenario. Thus, substantial highway system improvements in addition to the proposed by-passes would be necessary to accommodate the projected additional traffic associated with MHIR Alternative. Under the "without by-pass" scenario the adverse impacts would be significant and extensive highway improvements would be necessary to accommodate the projected traffic.

- **Indirect.** Some increases in traffic could occur as a result of secondary job generation serving the new reuse development. In addition, safety hazards and accident rates could increase as a result of the magnitude of traffic volume increase.

Medium Intensity Reuse Alternative

- **Direct.** Total traffic generation under MIR Alternative would be approximately one-third less than under MHIR Alternative, but external traffic would still increase by 100 percent above baseline conditions. Thus, some adverse impacts from increased traffic volumes on the adjacent roadway system are expected. Under this alternative, traffic volumes on State Route 21 south of FMC would increase by over 25 percent or more under the "without" by-pass alternative. As with MHIR Alternative, highway improvements would also be necessary under this alternative. Under the "without bypass" scenario impacts would be greater under the MIR Alternative and extensive improvements would be necessary .

- **Indirect.** If this alternative is implemented, the impacts would be the same as under MHIR Alternative, but of lesser magnitude.

Medium-Low Intensity Reuse Alternative

- **Direct.** Total traffic generation would be approximately one-half the volume generated under MHIR, and would be 50 percent above baseline conditions. Considering the current volume of traffic, State Route 21 south of FMC would not be significantly adversely impacted under this alternative as traffic volumes would increase by less than 15 percent under the "without" by-pass scenario and by less than five percent under the "with" by-pass scenario.

- **Indirect.** If this alternative is implemented, the impacts would be of much lesser magnitude than under the MIR and MHIR Alternatives.

Table 5.4 Estimated Distribution of Added External Traffic by Reuse Alternative

Roadway	Existing ADT (1995)	Medium-High Intensity (Added Traffic)		Medium Intensity (Added Traffic)		Medium-Low Intensity (Added Traffic)	
		Without By-Pass Improvement	With By-Pass Improvement	Without By-Pass Improvement	With By-Pass Improvement	Without By-Pass Improvement	With By-Pass Improvement
SR 21, north of Weaver Road	25,859	3,604	3,650	1,928	1,928	956	956
SR 21, Weaver Road to Hwy 431	34,204	5,475	2,554	2,893	1,157	1,435	570
SR 21, Hwy 431 to Hwy 202	43,000	25,552	9,126	10,609	4,822	6,697	2,392
SR 21, south of Hwy 202	38,713	20,077	5,475	10,609	2,893	5,262	1,435
Weaver Road, north of SR 21	8,788	1,825	1,825	964	964	478	478
Hwy 431, west of SR 21	23,686	5,475	9,126	2,893	2,893	1,435	1,435
Hwy 202, west of SR 21	16,774	3,650	1,825	1,928	964	985	478
Eastern By-Pass (Golden Springs)							
North of Coleman Road	11,243		14,601		7,715		3,827
Coleman Road to US Hwy 78	6,253		12,776		6,750		3,348
South of US Hwy 78	NA		12,251		5,786		2,870
South of I-20	NA		3,650		1,928		956

Western By-Pass							
Hwy 431 to Hwy 202	NA		5,475		2,893		1,435
South of Hwy 202	NA		3,650		1,928		957
Source: Parsons Engineering Science, 1997.							

5.4.8 Ordnance and Explosives

For properties where UXO is a concern, all land transfers will be reviewed by the Department of Defense Explosive Safety Board (DDESB) as required by AR 385-64 (USAEC, 1995b). DDESB approval of UXO removal plans is required for all UXO removal programs specifically undertaken to prepare a property for reuse. Details pertaining to this process are presented in subsections 1.3.9, 2.6.1.2, and 5.3.8.

DOD guidelines for UXO removal include the completion of an Engineering Evaluation and Cost Analysis (EE/CA) prior to the transfer of property. The EE/CA will determine the extent of UXO throughout the disposal area and present recommendations concerning the reuse type's that can be supported within the disposal area and clearance/removal recommendations. The EE/CA process also includes public participation which allows the communities concerns and priorities to be addressed.

The environmental impacts of UXO clearance activities, associated with the reuse of FMC disposal property, will be directly associated with the extent of UXO clearance activities. Therefore, in general terms it is anticipated that the environmental impacts associated with reuse will be highest in the MHIR Alternative and lowest in the MLIR Alternative.

Medium-High Intensity Reuse Alternative

- **Direct.** Under the MHIR alternative, UXO clearance activities will likely be required at locations within the 7,200-acre redevelopment area (Area 1) and the 11,000-acre passive recreation area (Area 2). Removal of the UXO will have impacts including the loss of habitat in the area, and the removal and disturbance of the soil and vegetation.

  Within the 7,200-acre redevelopment area (Area 1), UXO clearance may be required for a variety of sites as the MHIR Alternative includes the development of approximately 60 percent (4,320 acres) of the area. Within the redevelopment area are planned developments at sites containing known and possible ordnance impact areas, including:

  - McClellan Industrial Area (eastern portion);
  - Retirement Development Reserve (eastern and northwestern portions);
  - McClellan Commercial Center (portions near the Retirement Community);
  - Yahoo Retreat Area (central portion);
  - Eastern By-Pass Area (portion west of Yahoo Lake Retreat area); and
  - Truck Route (miscellaneous portions).

  In the MHIR Alternative the 11,000-acre passive recreation area (Area 2) will include extensive wildlife and plant management as well as public access. Consequently, the potential for, and degree of, UXO clearance activities within this parcel are higher than under the MIR or MLIR alternatives.

- **Indirect.** Indirect impacts associated with reuse would be directly related to the amount, depth, and type of soils removed during UXO clearance, and the location of the clearance activities within FMC. Adverse indirect impacts would principally be related to soil erosion from the clearance activities. This erosion would adversely impact the terrestrial habitats via the removal of soils and vegetation. Aquatic habitats would also be adversely impacted by sedimentation and siltation in the affected watersheds.

  Within the 7,200-acre redevelopment area (Area 1), most development is planned for areas that have already been developed or disturbed, and consequently will have minimal impact upon the natural

communities at FMC. However, there will be adverse impacts to the biological communities at some locations. These locations include the following:

- McClellan Industrial Area. Minor adverse impacts to fragmented forest habitats are anticipated.
- Retirement Development Reserve. Impacts to fragmented, unfragmented and interior forest habitats are anticipated.
- Commercial Center. Minor adverse impacts to fragmented forest habitats are anticipated.
- Yahoo Retreat Area. Impacts to fragmented, interior, and unfragmented forest habitats are anticipated.
- Eastern By-Pass Area. Impacts to the Reynolds Hill Turkey Oak SINA and to unfragmented fragmented forest habitats are anticipated.
- Truck Route. Impacts to fragmented and unfragmented forest habitats are anticipated.

Within the 11,000-acre passive recreational reuse area (Area 2), the MHIR Alternative has the potential for more UXO clearance activities than either the MIR and MLIR alternatives. Within this area of FMC, the slopes are steep and the soils highly erodible, compared to the western flatter portions of FMC. Consequently, UXO removal activities in this area may result in higher levels of erosion and siltation.

Medium Intensity Reuse Alternative

- **Direct.** Direct impacts under the MIR Alternative will be similar in nature to those described for the MHIR Alternative. However, under the MIR Alternative, the impacts within the 7,200-acre redevelopment area (Area 1) and the 11,000-acre passive recreation area (Area 2) are expected to be less under the MHIR Alternative.

  Within the 7,200-acre redevelopment area (Area 1) under the MIR Alternative, approximately 55 percent (3,960 acres) will be developed compared to approximately 60 percent (4,320 acres) under the MHIR Alternative. Consequently it is likely that the extent of UXO clearance will be less under the MIR Alternative, resulting in somewhat lower environmental impacts.

  Within the 11,000-acre passive recreation area under the MIR Alternative, public access to the area will be less (hunting and fishing will be restricted) when compared to the MHIR Alternative. Consequently it is likely that the need for extensive UXO clearance will be reduced compared to the MHIR alternative, thereby resulting in reduced impacts to the biological resources in the area.

- **Indirect.** Indirect impacts under the MIR Alternative will be similar in nature to those described for the MHIR Alternative. The magnitude of the impacts will be reduced under the MIR Alternative as the amount of area cleared in both the redevelopment area (Area 1) and the passive recreation area (Area 2) will be lower.

Medium-Low Intensity Reuse Alternative

- **Direct.** Direct impacts under the MLIR Alternative will be similar in nature to those described for the MHIR Alternative. However, under the MLIR Alternative, the impacts within the 7,200-acre redevelopment area (Area 1) and the 11,000-acre passive recreation area (Area 2) are expected to be less than under either the MHIR or MIR alternatives.

  Within the 7,200-acre redevelopment area under the MLIR Alternative, approximately 52 percent (3,744 acres) will be developed compared to approximately 55 percent (3,960 acres) under the MIR Alternative or approximately 60 percent (4,320 acres) under the MHIR Alternative. Consequently it is likely that the extent of UXO clearance will be less under the MLIR Alternative, resulting in somewhat lower environmental impacts compared to either the MHIR or MIR alternatives.

Within the 11,000-acre passive recreation area under the MLIR Alternative, public access to the area and wildlife/plant management within the area will be less compared to the MHIR and MIR alternatives. Consequently it is likely that the need for extensive UXO clearance will be reduced (or eliminated) compared to the MHIR and MIR alternatives, thereby resulting in reduced impacts to the natural resources in the area.

- **Indirect.** Indirect impacts under the MLIR Alternative will be similar in nature to those described for the MHIR Alternative. The magnitude of the impacts will be reduced under the MLIR Alternative (compared to both the MHIR and MIR alternatives) as the amount of area cleared in both the redevelopment area and the passive recreation area should be lower than in either of the other reuse alternatives.

5.4.9 Hazardous and Toxic Materials

As discussed in subsection 5.3.9, regardless of the reuse scenario the Army is committed to remediating all hazardous conditions associated with contamination caused by past or current activities on FMC excess property areas. All such hazards will be remediated, or deed notifications and restrictions will be passed on to new owners if the remaining hazards are compatible with the planned reuse.

Medium-High Intensity Reuse Alternative

Areas near former landfill sites are designated for industrial reuse. The presence of these landfills would restrict how the areas could be used for industrial activities. For instance, the load bearing capacity may be limited and the cap may not be disturbed. To make these areas available for unrestricted use would require the use of piling or the contents of the landfills be removed. As discussed in subsection 5.3.9, removing of the contents of former landfills could create a greater negative impact on the environment than leaving the materials in place.

- **Direct.** No impacts to hazardous and toxic materials would be expected if the MHIR Alternative was implemented. Reuse activities associated with industrial, commercial or mixed use of the excess FMC areas could create the potential for hazardous spills. The reuse activities would be required to operate in accordance with federal and state requirements pertaining to hazardous materials and hazardous wastes. Permitting and enforcement mechanisms would provide assurance against contamination of the environment media and would be protective of human health and the environment.

- **Indirect.** No impacts would be expected if the MHIR Alternative was implemented.

Medium Intensity Reuse Alternative

Areas near former landfill sites are designated for industrial reuse. As discussed above under MHIR Alternative, the presence of these landfills may restrict the planned reuse options for these areas.

- **Direct.** No impacts would be expected. Conditions would be similar to MHIR Alternative described above.

- **Indirect.** No impacts would be expected if the MIR Alternative was implemented.

Medium-Low Intensity Reuse Alternative

Areas near former landfill sites are designated for industrial reuse. As discussed above under the MHIR Alternative, the presence of these landfills may restrict the planned reuse alternatives for these areas.

- **Direct.** No impacts would be expected. Conditions would be similar to the MHIR Alternative described above.

- **Indirect.** No impacts would be expected if the MLIR Alternative was implemented.

5.4.10 Permits and Regulatory Authorizations

Medium-High Intensity Reuse Alternative

- **Direct.** No direct impacts to permits and regulatory authorizations would be expected if the MHIR Alternative was implemented. Operating permits and regulatory authorizations would be required for infrastructure systems and specific activities by reuse entities. Permits and authorizations to continue activities previously conducted by the Army would be subject to procedures and rules of the regulatory agencies, but may be allowed to be transferred to the new owners. For operational matters not currently covered, future owners and operators would be required to obtain permits and authorizations independently. Activities occurring in industrial reuse areas would likely require a variety of new permits and authorizations. Continuity of permitting and enforcement mechanisms would provide assurance against contamination of environmental media and would be protective of human health and the environment.

- **Indirect.** Implementation of the MHIR Alternative would result in no indirect to permits and regulatory authorizations.

Medium Intensity Reuse Alternative

- **Direct.** No impacts to permits and regulatory authorizations would be expected as a result of implementing the MIR Alternative. Conditions would be similar to those described above under MHIR Alternative.

- **Indirect.** No impacts to permits and regulatory authorizations would be expected as a result of implementing the MIR Alternative.

Medium-Low Intensity Reuse Alternative

- **Direct.** No impacts to permits and regulatory authorizations would be expected as a result of implementing the MLIR Alternative. Conditions would be similar to those described above under MHIR Alternative.

- **Indirect.** No impacts to permits and regulatory authorizations would be expected as a result of implementing the MLIR Alternative.

5.4.11 Biological Resources

Impacts to biological resources as a result of reuse differ with the location within the disposal area. In general, impacts associated with reuse within the FMDC redevelopment area (Area 1) will be similar among the three reuse alternatives since: 1) much of this area is already developed as it contains the current FMC cantonment area and 2) the general reuse type is the same under each reuse alternative, only the overall intensity differs. Consequently, the reuse impacts to the biological resources in this portion of FMC will be similar among the reuse alternatives.

Impacts to biological resources within the FMDC passive recreation area (Area 2) will, however, differ among the three reuse alternatives as the nature and extent of the management activities and public access differ among the three reuse alternatives (Table 3.2). The differences in management activities among the alternatives, as they relate to environmental impacts, are principally associated with the utilization of prescribed burning (and its influence on the MLP ecosystem and certain SINAs), the degree of timber management, the degree of public access, and the extent of threatened and endangered species, other species of concern, and wetlands management activities.

The Army currently manages the biological and natural resources of FMC as federal property under a wide range of federal laws, executive orders, and Army regulations and guidelines. Many of these policies require positive management actions which benefit the biological resources at FMC. The transfer from Army to private ownership could result in the overall reduction of wildlife management activities at FMC thereby resulting in adverse impacts to the biota of the area. The extent of these adverse impacts will be directly related to the extent of wildlife management activities undertaken by the future owners.

As mentioned in subsection 5.3.11.4, FMC entered into informal consultations with the USFWS to identify any adverse effects and required measures to minimize those effects to threatened and endangered species. Additional field studies to determine the occurrence of gray bats on FMC were recently completed as part of the informal consultation process with the USFWS.

5.4.11.1 Fish and Wildlife

Medium-High Intensity Reuse

- **Direct.** Implementing the MHIR Alternative will result in short-term adverse impacts during construction of new projects. Noise and dust could reduce nesting success of NTMB, particularly in Area 2. Some direct mortality could occur to small mammals, reptiles, and nesting birds during clearing and grubbing operations, particularly in Area 1. For game species impacts see subsection 5.4.11.6.

- **Indirect.** Long-term adverse impacts would occur to NTMB due to a decrease in forest habitat in portions of Area 1 (see subsection 5.4.11.2, Vegetation and Plant Resources), increased forest fragmentation (see subsection C.2.2 in Appendix C for an explanation of forest fragmentation's impacts on NTMB), and increased traffic noise, that would be associated with implementation of the MHIR Alternative. Short-term adverse impacts would occur to aquatic species due to soil erosion during the construction phase, principally within the Redevelopment Area (Area 1). Minor long-term adverse impacts could occur to aquatic species due to increased automobile traffic, and ground maintenance. These activities could result in greater use of fertilizer and pesticides, and increased leaks and spills of automobile fluids.

Medium Intensity Reuse Alternative

- **Direct.** Implementation of the MIR Alternative, would be expected to result in impacts similar to, but less extensive than the MHIR Alternative.

- **Indirect.** Impacts to NTMB would be expected to be the same as MHIR Alternative if the MIR Alternative is implemented, since the impacts to the large MLP forest block will be similar. Impacts to aquatic species would be expected to be slightly less than MHIR Alternative.

Medium-Low Intensity Reuse Alternative

- **Direct.** Implementation of the MLIR Alternative would be expected to result in slightly less impacts than MIR Alternative for non-game species. For game species impacts see subsection 5.4.11.6.

- **Indirect.** If the MLIR Alternative is implemented, impacts would be similar to those detailed for the MHIR Alternative. Additionally, impacts to NTMB, within Area 2, would occur in that a change in NTMB species composition would be expected, associated with a change from a MLP forest block to a hardwood dominated forest block. The overall size of the forest block, however, anticipated to similar among the alternatives. Impacts to aquatic species would be expected to be slightly less than MIR Alternative.

5.4.11.2 Vegetation and Plant Resources

Medium-High Intensity Reuse Alternative

- **Direct.** Long-term adverse impacts would occur due to loss of forest habitat, if the MHIR Alternative is implemented. Within Area 1, development of the rail industrial park, executive golf course, retail center, McClellan retirement golf community and Yahoo Retreat would result in the removal of approximately 800 acres of fragmented forest and 200 acres of unfragmented forest (see Figure 2-4 in Section 2, and Figures C-1, C-2 and C-3 in Appendix C). While not directly destroyed, the amount of interior forest would decrease by approximately 300 acres due to encroachment (see definition of interior forest in subsection C.2.2 of Appendix C). Impacts within Area 2 are expected to be minimal as little development is planned, therefore associated habitat loss or damage will be minimal.

- **Indirect.** Long-term adverse impacts could occur if the MHIR Alternative is implemented. Construction activity, particularly in Area 1, would create conditions favorable for populations of exotic species of plants to expand. Impacts within Area 2 are expected to be minimal as little development is planned and management activities, including prescribed burns, will maintain the area in a manner similar to existing conditions. Through the use of prescribed burning, the MLP ecosystem will be maintained.

Medium Intensity Reuse Alternative

- **Direct.** If the MIR Alternative is implemented, impacts would be expected to be the same or slightly less than if the MHIR Alternative was implemented.

- **Indirect.** If the MIR Alternative is implemented, impacts would be expected to be the same or slightly less than if the MHIR Alternative was implemented.

Medium-Low Intensity Reuse Alternative

- **Direct.** If the MLIR Alternative is implemented, impacts would be expected to be the same or slightly less than if the MIR Alternative was implemented.

- **Indirect.** If the MLIR Alternative is implemented, forestry management practices, in Area 2, will not include the continuation of prescribed burns. Without range fires or a prescribed burn program there will be long-term significant adverse impacts to the MLP ecosystem at FMC. Longleaf pine regeneration will decrease. Longleaf pine seedlings and saplings, which are tolerant of fire, but are poor competitors for water and nutrients will be replaced by various deciduous species and/or loblolly pine. Diversity and abundance of the herbaceous understory will decrease over time. The absence of fire will allow deciduous shrubs and vines and eventually deciduous overstory species to express greater dominance. Canopy closure will become more complete and will allow less sunlight to reach the forest floor. State ranked herbaceous species such as sky blue aster, pale coneflower, eastern purple coneflower, and Fraser's loosestrife would be adversely impacted.

5.4.11.3 Wetlands

Medium-High Intensity Reuse Alternative

- **Direct.** Long-term adverse impacts to wetlands could occur, principally in Area 1, if the MHIR Alternative is implemented. Development in or adjacent to wetlands would adversely impact wetlands. Current redevelopment plans include an industrial park that may be located within jurisdictional wetland areas. Building and parking lot placement could result in the dredging or filling of wetlands located in this area.

- **Indirect.** Long-term adverse impacts to wetlands could occur, principally in Area 1, if the

MHIR Alternative is implemented. Impacts could be due to runoff from the industrial park, golf courses, and other new development. During the construction phase, runoff and soil erosion could adversely impact wetlands. Post construction impacts would be related to an increase in impervious surface areas. Run-off, from impervious areas could include pesticides, fertilizer, automobile fluids. Potential run-off from the industrial area would depend on the type of industry.

Medium Intensity Reuse Alternative

- **Direct.** If the MIR Alternative is implemented, impacts would be expected to be the same or slightly less than if the MHIR Alternative is implemented.

- **Indirect.** If the MHIR Alternative is implemented, impacts would be expected to be the same or slightly less than if the MHIR Alternative is implemented for the majority of wetlands. See subsection 5.4.11.5 for a discussion on how the lack of fire may affect the WFO.

Medium-Low Intensity Reuse Alternative

- **Direct.** If the MLIR Alternative is implemented, impacts would be expected to be the same or slightly less than if the MIR Alternative is implemented.

- **Indirect.** If the MLIR Alternative is implemented, impacts would be expected to be the same or slightly less than if the MIR Alternative is implemented.

5.4.11.4 Federal Threatened and Endangered Species

Medium-High Intensity Reuse Alternative

- **Direct.** No direct effects would be expected to Federal T&E species if the MHIR Alternative is implemented. Pursuant to Section 7 of the Endangered Species Act (ESA), FMC conducted informal consultation with the USFWS to identify any project design features (PDFs) that might be required to avoid adverse or minimize effects to the gray bat. A Biological Assessment (BA) was completed in consultation with the USFWS to identify potential effects and PDFs. Based upon the results of the BA and implementation of the PDFs and the additional protective measures described in the USACE July 1998 letter to the USFWS, no adverse effects to the gray bat are expected.

- **Indirect.** No indirect effects would be expected to Federal T&E species if the MHIR Alternative is implemented. A Biological Assessment (BA) was prepared to identify potential effects and PDFs. Based upon the results of the BA and implementation of the PDFs and the additional protective measures described in the USACE July 1998 letter to the USFWS, no adverse effects to the gray bat are expected.

Medium Intensity Reuse Alternative

- **Direct.** No direct effects would be expected, if the MIR Alternative is implemented.

- **Indirect.** No indirect effects would be expected, if the MIR Alternative is implemented.

Medium-Low Intensity Reuse Alternative

- **Direct.** No direct effects would be expected, if the MLIR Alternative is implemented.

- **Indirect.** No indirect effects would be expected, if the MLIR Alternative is implemented.

5.4.11.5 Other Species of Concern

Medium-High Intensity Reuse Alternative

- **Direct.** No direct impacts are expected, within Area 2, as management activities will be similar to those currently in place if the MHIR Alternative is implemented. Within Area 1, impacts will be minimal since most of the SINAs and other species of concern are located within Area 2. Impacts are possible however, within the southwestern portions of Area 1, where the Reynolds Hill Turkey Oak SINA and scattered MLP stands maybe adversely affected by adjacent development activities.

- **Indirect.** Long-term adverse impacts could occur, if the MHIR Alternative is implemented. Encroachment upon the MLP ecosystem, principally within Area 2, due to new development, could alter the forest block (see the discussion under Vegetation and Plant Resources located in subsection 5.4.11.2). The ecological importance of the MLP forest ecosystem is based on it's unfragmented condition, large size, lack of exotic species, and importance to NTMB and rare species. Encroachment could allow an increase in exotic plants, reduce the effective size of the ecosystem, decrease the amount of quality habitat for interior and ground nesting NTMB, and/or degrade habitat that serves as a buffer for rare plant species and SINA.

Medium Intensity Reuse Alternative

- **Direct.** Impacts under the MIR Alternative are expected to be similar or slightly less than those under the MHIR Alternative.

- **Indirect.** If the MIR Alternative is implemented, the impacts would be expected to be the same or slightly less than if the MHIR Alternative is implemented.

Medium-Low Intensity Reuse Alternative

- **Direct.** Impacts under the MLIR Alternative are expected to be similar or slightly less than those under the MIR Alternative.

- **Indirect.** Without range fires or a prescribed burn program there will be long-term significant adverse impacts to the natural areas and the MLP ecosystem, principally within Area 2. Fire is needed to maintain the long-term viability of the MLP ecosystem and the unique habitats it harbors. The white fringeless orchid (WFO) occurs within seep communities that would be dominated by deciduous shrub species without periodic fire. Periodic fires remove the shrub component from the perimeters of these seeps and create conditions favorable for the WFO. In the absence of range fires and/or prescribed burns the shrubs would likely extend their dominance from the center of the seeps towards the border of the seeps, thereby reducing WFO populations. Longleaf pine regeneration would also decrease without range fires and/or a prescribed burn program (see discussion under Vegetation/Plant Resources). Special Interest Natural Areas (SINA) affected by lack of periodic fires would include the MLP ecosystem, Marcheta Hill Orchid Seep, Cave Creek Seep, Morman Hill Mountain Juniper, Reynolds Hill Turkey Oak, and Frederick Hill Aster Site. Diversity and abundance of the herbaceous understory would decrease over time. Populations of species that are fire adapted or need open canopies such as little bluestem, Indian grass, various asters, rosinweed, wild quinine, flowering spurge, and goat's rue that are associated with the MLP ecosystem would decrease over time. Exotic species such as Chinese privet, kudzu, and Japanese honeysuckle would be more likely to increase in the absence of fire.

5.4.11.6 Integrated Natural Resources Management Provisions

Medium-High Intensity Reuse Alternative

- **Direct.** Long-term beneficial direct impacts could occur, if the MHIR Alternative is implemented. Inactive range areas, in Area 2, would be more accessible to hunters and other outdoor recreation users. FMC also had its own hunting permit requirements. More hunters may decide to use this area if there are fewer permit requirements.

- **Indirect.** Minor long-term indirect adverse impacts are expected, principally within Area 2, if the MHIR Alternative is implemented. Indirect benefits received from range induced wildfires, firebreaks maintained by range personnel, and controlling of access to threatened and endangered species locations within ranges would decrease. There would be a transition period before a cooperating agency could implement a prescribed burn program at FMC. If a cooperating agency that is willing to conduct an extensive prescribed burn program at FMC can not be found the potential exists for long-term significant adverse impacts to the MLP communities, WFO, and other fire adapted species. Currently no agency that has sufficient expertise, manpower, and funding has agreed to manage these lands.

Medium Intensity Reuse Alternative

- **Direct.** Long-term direct adverse impacts are expected, if the MIR Alternative is implemented. There will be a decrease in the availability of area public hunting lands.

- **Indirect.** If the MIR Alternative is implemented, the resulting limited timber management practices may have a minor adverse indirect impacts on the local loggers and sawmills. The local supply of timber may decrease slightly.

Medium-Low Intensity Reuse Alternative

- **Direct.** Long-term adverse direct impacts are expected, if the MLIR Alternative is implemented. There will be a decrease in the availability of area public hunting lands, principally within Area 2.

- **Indirect.** Long-term adverse indirect impacts are expected, if the MLIR Alternative is implemented. Restricted hunting, no fish and wildlife management, and no timber management practices, principally within Area 2, could result in: 1) an overabundant deer population which may cause over browsing of understory vegetation including species of concern plants; 2) regeneration to more economically undesirable timber species; 3) economic loss of no timber harvesting; 4) a trend to fewer successional stages as climax communities would ultimately dominate the area due to natural succession; 5) loss of the MLP ecosystem resulting from the loss of sufficient fires to maintain the ecosystem; and 6) replacement of the MLP ecosystem with hardwood and hardwood/pine climax ecosystems.

5.4.12 Cultural Resources

Medium-High Intensity Reuse Alternative

- **Direct.** Implementation of the MHIR Alternative will result in no adverse or nonmitigable effects to NRHP properties, as adverse effects could either be avoided through the use of deed restrictions, or reduced to a minor level by completing mitigation measures mutually agreed upon by the Army, Alabama SHPO and the Advisory Council on Historic Preservation (ACHP) as part of the NHPA Section 106 consultation process.

- **Indirect.** Indirect impacts to FMC historic properties can either be avoided through the use of preservation covenants or mitigated to a minor level by carrying out agreed upon mitigation measures.

Medium Intensity Reuse Alternative

- **Direct.** The discussion above for the MHIR Alternative applies in the case of MIR Alternative as well.

- **Indirect.** Indirect impacts to FMC historic properties can either be avoided through the use of preservation covenants or mitigated to a minor level by carrying out agreed upon mitigation measures.

Medium-Low Intensity Reuse Alternative

- **Direct.** The discussion above for MHIR Alternative applies in the case of MLIR Alternative as well.

- **Indirect.** Indirect impacts to FMC historic properties can either be avoided through the use of preservation covenants or mitigated to a minor level by carrying out agreed upon mitigation measures.

5.4.13 Sociological Resources

Medium-High Intensity Reuse Alternative

- **Direct.** Potential short-term adverse impacts could occur related to the population increase associated with the 9,584 new jobs created, if the MHIR Alternative is implemented. Total employment under the MHIR Alternative would approximately 14,000. The total daytime population, including employees and residents, would almost double to over 17,600 from the current level of approximately 9,000. As indicated in Table 5.4, there would be a net increase in population of approximately 3,600. This is based on the assumption that a minimum of forty (40) percent of the new employees will relocate to the area, while the military personnel and a certain percentage of the former DOD civilian personnel directly associated with current installation operations will move out of the area. The percent of employees estimated to relocate reflects the current and potential employment pool, or labor force, and skill levels within the region of influence which would have to be supplemented by in-migrants.

  No disproportionately high or adverse human health or environmental impacts would be incurred by minority and low-income populations within the surrounding area by reuse of the surplus property. Low-income populations could economically benefit from construction jobs associated with project construction and/or subsequent long-term employment opportunities from reuse activities.

- **Indirect.** Short-term potential adverse impacts could occur in respect to housing demand by the new population/work force, and associated increased demands on public services, such as schools, police and fire protection. New housing and infrastructure construction, school construction/expansion, and expansion of police and fire protection facilities and personnel would be necessary to accommodate the additional demands of the increased population. The Economic Impact Forecast System (EIFS) Model estimates that reuse activities under this intensity level could potentially result in 1,143 additional school-age children, and a demand for an additional 3,600 housing units with the majority being owner-occupied (Table 5.5). However, the above population increase and service demands would occur over a number of years (20-year estimated buildout period), therein not creating significant adverse impacts over a short period of time.

Medium Intensity Reuse Alternative

- **Direct.** No adverse impacts would be expected related to the population increase associated with implementation of the MHIR Alternative. Implementation of this alterative will result in 4,587 new jobs and total employment of approximating 9,000 at the installation. Daytime population would increase to 11,886, or an approximate 32 percent increase from the baseline conditions. However, as indicated in Table 5.5, there would be a net decrease of 5,272 in total population as the number of military and civilian personnel moving out of the area would exceed the number of new in-migrants. This is based on the assumption that a minimum of 20 percent of the new employees will relocate to the area, while all of the military personnel and a certain percentage of the civilian personnel associated with installation activities would relocate out of the area.

  No disproportionately high or adverse human health or environmental impacts would be incurred by minority and low-income populations within the surrounding area by reuse of the surplus property. Low-income populations could economically benefit from construction jobs associated with project construction and/or subsequent long-term employment opportunities from reuse activities.

- **Indirect.** No indirect adverse impacts would be expected if the MIR Alternative is implemented. According to the EIFS Model, the number of school-age children directly resulting from reuse activities would decrease by 385 from baseline conditions, while total housing demand would also decrease. Similarly, there would be no adverse impacts on low-income or minority populations under this alternative.

Medium-Low Intensity Reuse Alternative

- **Direct.** No direct impacts are anticipated if the MLIR Alternative is implemented. New employee population would only be 1,647 above baseline employment, while total daytime population would increase by only 372. However, as indicated in Table 5.5, local and regional population would decrease by 9,577 from baseline conditions. This is based on the assumption that there would be little or no in-migration to offset the loss of the military related population and a portion of the civilian personnel. There would be a commensurate decrease in housing demand and school enrollment compared to baseline conditions.

- **Indirect.** No indirect impacts would be expected if the MLIR Alternative is implemented. Because of the substantial decrease in total population associated with this alternative, the number of school-age children associated directly with reuse activities would decrease by 1,124 from baseline conditions, with housing demand also substantially decreasing.

5.4.14 Economic Development

The President's Five-Part Plan is a program designed to speed economic recovery of communities near closing military installations. The plan provides initiatives for rapid redevelopment and creation of new jobs. The socioeconomic impacts of the implementation of the reuse alternatives are estimated by the application of the Economic Impact Forecast System (EIFS) Model. Inputs required for model execution include the changes in employment and expenditures between baseline conditions (1995) and under each reuse alternative. Table 5.5 indicates the changes in employee population and total expenditures under the three alternative reuse plans. Changes in employment and spending (expenditures) represent the direct effects of the action. Based upon the above input data and application of calculated multipliers, the model estimates both direct and indirect impacts on various socioeconomic indicators, including sales volume, employment, income, population, housing, school enrollment and government income and expenditures for the Region of Influence (ROI). Tables 5.6, 5.7 and 5.8 indicate the net changes from baseline conditions in the above socioeconomic indicators under each alternative reuse plan. All of the subsequent numbers cited in the text of this subsection refer to net changes from baseline conditions. The Rational Threshold Value (RTV), or degree of significance of change, is also calculated for key economic indicators. Appendix D describes the EIFS Model in more detail, and contains the input and output data for baseline operations (1995), reuse alternatives and facility construction.

Table 5.5 EIFS Model Input Parameters For Each Reuse Alternative

Reuse Intensity	Employee Population [1]	Change in Employee Population [2]	Total Expenditures [3]	Change in Total Expenditures [4]
MHIR Alternative	13,989	9,584	$331,269,000	$285,852,000
MIR Alternative	8,992	4,587	$214,582,000	$169,165,000
MLIR Alternative	6,052	1,647	$144,977,000	$99,560,000

Notes: 1 See Table 3.1 for calculation of employee population.
2 Projected reuse employee population minus 1995 baseline employee population of permanent party military and civilian personnel (4,405).
3 Derived from multiplying estimated average expenditure per employee by employee population. See Table D.1, Appendix D.
4 Derived from subtracting baseline (1995) non-salary expenditures ($45,417,000) from estimated reuse expenditures.

Source: EIFS Model and Parsons Engineering Science, Inc.

Medium-High Intensity Reuse Alternative

· **Direct.** Both short-term and long-term beneficial impacts would occur under this alternative. MHIR Alternative assumes higher floor area ratios (FARs) and employee densities than MIR and MLIR alternatives. Under MHIR Alternative approximately 14,000 employees would be located on the reused site. However, the total on-site resident population of 3,665 would be approximately one-third less than that under baseline conditions.

Table 5.6 summarizes the net change in economic impacts of MHIR Alternative. Direct long-term impacts resulting from employment and expenditures associated with the reuse activities include the creation of 2,378 additional new jobs in the retail, service and industrial sectors; the generation of $35.89 million in additional annual income as a result of the jobs directly created; and, an increase of $265.3 million in annual regional sales (business) volume. All of the above increases would significantly exceed the respective RTV's for the economic indicators for the ROI. However, these increases in economic activity would occur over an extended period of time and represent the level of impact at full build-out. Government revenues would increase by $16.5 million under this alternative, with the enhanced tax base from reuse resulting in increased real property tax revenue. In addition, sales tax revenue would increase substantially under this alternative.

Direct short-term beneficial impacts would result from construction of the reuse facilities and associated infrastructure. The EIFS Model estimates that business volume would increase by $146.6 million while total regional income would increase by $103.5 million. A total of 1,267 additional jobs would be directly created in the retail, service and industrial sectors generating $19.1 million in direct income. Although all of the RTVs for the economic indicators are exceeded under this alternative, construction activity would occur over an extended period of time. Thus, the annual economic impacts resulting from facility construction would not be expected to be significant.

Table 5.6 EIFS Standard Model Outputs for MHIR: Net Change from Existing Operations

Economic Indicator	Projected Change	Percent Change	RTV Range
Direct Sales Volume	$265,669,000	266.67	NA
Indirect Sales Volume	$308,549,000	266.67	NA
Total Sales Volume	$574,218,000	266.67	-5.03% to 6.81%
Direct Employment	2,378	266.59	NA
Indirect Employment	2,762	366.85	NA
Total Employment	11,564	121.82	-3.38% to 2.80%
Direct Income	$35,890,000	266.46	NA
Indirect Income	$42,688,000	200.00	NA
Total Income	$183,940,000	103.32	-4.02% to 5.63%
Local Population	3,617	25.90	-0.95% to 2.12%
Local Off-Base Population	8,595	95.63	NA
Number of School Children	1,143	60.86	NA
Demand for Housing Rental	337	22.80	NA
Owner-Occupied	3,263	148.52	NA
Total Housing Demand	3,600	100.00	NA
Government Expenditures	$24,924,000	193.75	NA
Government Revenues	$16,578,000	100.00	NA
Net Government Revenues	-$8,346,000	-234.37	NA
Civilian Employees Expected to Relocate	7,274	NA	NA

Note: N/A Not Applicable.

Source: EIFS Model and Parsons Engineering Science, Inc.

- **Indirect.** Long-term beneficial impacts would result from reuse under the MHIR Alternative. As a result of the direct impacts, 2,762 additional jobs would be indirectly created; and, $308.5 million in additional annual indirect sales volume and $42.6 million in additional indirect annual income generated. Direct and indirect employment resulting from reuse under this alternative would total 5,140, with the increase in total annual sales volume (direct and indirect) estimated at $574.2 million and total annual income increasing by $183.9 million.

  Indirect short-term beneficial impacts would result from construction of the reuse facilities and associated infrastructure. The EIFS Model estimates that there would be an indirect increase of $170.3 million in business volume, while 1,472 additional jobs would be indirectly created in the retail, service and industrial sectors.

Medium Intensity Reuse Alternative

- **Direct.** Long-term beneficial impacts would occur under this alternative, but the magnitude of impacts would not be as great as under MHIR Alternative. The MIR Alternative assumes lower FARs and employee densities than MHIR Alternative. Under the MIR Alternative, approximately 9,000 employees would be located on the reused site, with a total on-site resident population of 2,894.

  Table 5.7 summarizes the regional economic impacts of MIR Alternative. Net direct impacts resulting from employment and expenditures associated with the reuse activities include the creation of 1,218 additional new jobs in the retail, service and industrial sectors; the generation of $18.38 million in additional annual income as a result of the jobs directly created; and, an increase of $136 million in regional annual sales volume. All of the above increases would significantly exceed the RTVs for the respective economic indicators for the ROI. However, these increases in economic activity would occur over an extended period of time and represent the level of impact at full build-out. Government revenues would increase by $3.3 million under this alternative, with the enhanced tax base from reuse resulting in increased real property tax revenue. In addition, sales tax revenue would increase substantially under this alternative.

Table 5.7 EIFS Standard Model Outputs for MIR: Net Change from Existing Operations

Economic Indicator	Projected Change	Percent Change	RTV Range
Direct Sales Volume	$136,072,000	136.58	NA
Indirect Sales Volume	$158,041,000	136.58	NA
Total Sales Volume	$294,113,000	136.58	-5.03% to 6.81%
Direct Employment	1,218	136.54	NA
Indirect Employment	1,415	136.71	NA
Total Employment	4,060	42.77	-3.38% to 2.80%
Direct Income	$18,383,000	136.59	NA
Indirect Income	$22,351,000	152.80	NA
Total Income	$54,904,000	30.83	-4.02% to 5.63%
Local Population	-5,272	-37.75	-0.95% to 2.12%
Local Off-Base Population	-294	-3.27	NA
Number of School Children	-385	-20.50	NA
Demand for Housing Rental	-581	-39.30	NA
Owner-Occupied	503	22.89	NA
Total Housing Demand	-78	25.27	NA
Government Expenditures	$8,892,000	69.12	NA
Government Revenues	$3,321,000	29.21	NA
Net Government Revenues	-$5,571,000	-256.44	NA
Civilian Employees Expected to Relocate	1,798	NA	NA

Note N/A Not applicable

Source: EIFS Model and Parsons Engineering Science, Inc.

Direct short-term beneficial impacts would result from construction of the reuse facilities and associated infrastructure. The EIFS Model estimates that business volume would increase by $103.1

million while total regional income would increase by $72.8 million. A total of 891 additional jobs would be created in the retail, service and industrial sectors directly generating $13.4 million in income. None of the RTVs for the economic indicators are exceeded under this alternative.

- **Indirect.** Long-term beneficial impacts would result from MIR Alternative. As a result of the direct impacts, 1,415 additional jobs would be indirectly created; and, $158 million in additional indirect sales volume and $22.3 million in additional income generated. Direct and indirect employment resulting from reuse under this alternative would total 2,633, with the increase in total sales volume (direct and indirect) estimated at $294 million and total income increasing by $54.9 million.

  Indirect short-term beneficial impacts would result from construction of the reuse facilities and associated infrastructure. The EIFS Model estimates that there would be an indirect increase of $119.7 million in business volume, while 1,034 additional jobs would be indirectly created in the retail, service and industrial sectors.

Medium-Low Intensity Reuse Alternative

- **Direct.** Long-term beneficial impacts would occur under this alternative. MLIR Alternative assumes lower FARs and employee densities than MIR Alternative. Under the MLIR Alternative approximately 6,000 employees would be located on the reused site, with a total on-site resident population of 2,600. Thus, the overall economic impact would be of the least magnitude under this alternative.

  Table 5.8 summarizes the regional economic impacts of MLIR Alternative. Direct net impacts resulting from employment and expenditures associated with the reuse activities include the creation of 531 additional new jobs; the generation of $8 million in additional annual income as a result of the jobs directly created; and, an increase of $59.3 million in regional annual sales volume. However, government revenues would decrease by $3.9 million under this alternative. This decrease is directly the result of the loss of the military and government workers at the installation.

  Direct short-term beneficial impacts would result from construction of the reuse facilities and associated infrastructure. The EIFS Model estimates that business volume would increase by $75.1 million while total regional income would increase by $53 million. A total of 649 additional jobs would be created in the retail, service and industrial sectors directly generating $9.8 million in income. None of the RTVs for the economic indicators are exceeded under this alternative.

Table 5.8 EIFS Standard Model Outputs for MLIR: Net Change from Existing Operations

Economic Indicator	Projected Change	Percent Change	RTV Range
Direct Sales Volume	$59,318,000	59.53	NA
Indirect Sales Volume	$68,895,000	59.53	NA
Total Sales Volume	$128,213,000	59.53	-5.03% to 6.81%
Direct Employment	531	59.52	NA
Indirect Employment	617	59.61	NA
Total Employment	-365	-3.84	-3.38% to 2.80%
Direct Income	$8,014,000	59.53	NA
Indirect Income	$10,307,000	70.41	NA
Total Income	-$21,164,000	-11.89	-4.02% to 5.63%
Local Population	-9,577	-68.57	-0.95% to 2.12%
Local Off-Base Population	-4,599	-51.17	NA
Number of School Children	-1,124	-59.85	NA

Demand for Housing	Rental	-1,025	-69.35	NA
	Owner-Occupied	-834	-37.96	NA
	Total Housing Demand	-1,859	-50.58	NA
Government Expenditures		$354,000	2.75	NA
Government Revenues		-$3,961,000	-24.11	NA
Net Government Revenues		-$4,315,000	-221.17	NA
Civilian Employees Expected to Relocate		0	NA	NA
Notes N/A Not applicable				
Source: EIFS Model and Parsons Engineering Science, Inc.				

- **Indirect.** Long-term beneficial impacts would result from MLIR Alternative, but of less magnitude than under MIR Alternative. As a result of the direct impacts, 617 additional jobs would be indirectly created; and, $68.8 million in additional indirect annual sales volume and $10.3 million in additional annual income generated. However, total income would decrease by $21.1 million primarily as a result of the loss of the higher paying military and DOD civilian jobs. Direct and indirect employment resulting from reuse under this alternative would total 1,148, with the increase in total sales volume (direct and indirect) estimated at $128.2 million.

  Indirect short-term beneficial impacts would result from construction of the reuse facilities and associated infrastructure. The EIFS Model estimates that there would be an indirect increase of $87.3 million in business volume, while 754 additional jobs would be indirectly created in the retail, service and industrial sectors.

5.4.15 Quality of Life

Medium-High Intensity Reuse Alternative

- **Direct.** Some short-term adverse impacts would be expected in respect to the school system and housing market, if the MHIR Alternative is implemented. The estimated school enrollment increase of 1,143, an increase of six percent over current regional enrollment, could result in overcrowding and necessitate construction of new school facilities. The projected demand for 3,600 housing units could strain the local and regional housing supply. However, since development will occur over an extended period of time, the current educational facilities and housing supply should be able to absorb these increases without major adverse impacts.

  The increase in population could cause an increase in the demand for public and family support services. However, services should be able to expand accordingly due to increased tax revenues from the new development. No impacts would be expected regarding recreational facilities considering the current array of recreational opportunities available within the region, and the proposed open space and recreational uses within the reuse plan. An increase in shopping and service facilities would be expected due to the increase in population under MHIR Alternative.

- **Indirect.** Short- and long-term minor adverse impacts could be expected, if the MHIR Alternative is implemented. Considering the rural and semi-rural nature of the area, visual and aesthetic values could be adversely affected by construction in the short-term, while the substitution of more intense and potentially obtrusive development could cause long-term adverse impacts to the visual and aesthetic resources.

Medium Intensity Reuse Alternative

- **Direct.** No major impacts are anticipated as school enrollment would decrease under this alternative

compared to baseline conditions, while the regional and local housing supply should be adequate to satisfy most of the new demand for owner-occupied housing. No impacts would be expected regarding family support services, recreation, and shops and services.

- **Indirect.** No indirect impacts would be expected if this alterative was implemented.

Medium-Low Intensity Reuse Alternative

- **Direct.** No direct impacts would be expected if this alterative was implemented.

- **Indirect.** No indirect impacts would be expected if this alterative was implemented.

5.4.16 Installation Agreements

Medium-High Intensity Reuse Alternative

- **Direct.** No direct impacts would be expected if this alterative was implemented. The installation agreements between the Army and local agencies for provisions of various services would be continued until disposal of the excess area is complete. Those services are presently, and would continue to be, provided by local agency suppliers outside the boundaries of the disposal area.

- **Indirect.** No indirect impacts would be expected if this alterative was implemented.

Medium Intensity Reuse Alternative

- **Direct.** No direct impacts would be expected if this alterative was implemented. Conditions would be similar to, but less severe than, those affecting MHIR Alternative.

- **Indirect.** No indirect impacts would be expected if this alterative was implemented.

Medium-Low Intensity Reuse Alternative

- **Direct.** No direct impacts would be expected if this alterative was implemented. Conditions would be similar to, but less severe than, those affecting MHIR and MIR alternatives.

- **Indirect.** No indirect impacts would be expected if this alterative was implemented.

5.5 CUMULATIVE IMPACT - NO ACTION, DISPOSAL AND REUSE ALTERNATIVES

5.5.1 Introduction

Subsections 5.2 through 5.4 identify impacts of the No Action Alternative; the ED and UD alternatives for disposal; and the MLIR, MIR and MHIR alternatives for reuse. The cumulative impacts analysis evaluates the direct and indirect effects of implementing any one of the alternatives in association with past, present and reasonably foreseeable Army actions and the actions of other parties.

Subsections presented in the following pages include:

- 5.5.2 Summary of Past, Present, and Reasonably Foreseeable Future Actions
- 5.5.3 No Action alternative - Cumulative Impacts
- 5.5.4 Encumbered and Unencumbered Disposal - Cumulative Impacts
- 5.5.5 Disposal and Reuse - Cumulative Impacts
  - 5.5.5.1 MHIR Encumbered Disposal Alternative
  - 5.5.5.2 MIR Encumbered Disposal Alternative
  - 5.5.5.3 MLIR Encumbered Disposal Alternative

5.5.2 Summary of Past, Present, and Reasonably Foreseeable Future Actions

The cumulative impacts analysis considers past, present and reasonably foreseeable actions within and around FMC. Interviews were conducted with private sector and governmental agency representatives knowledgeable of past, present and future actions within the area. Agencies and organizations contacted included the following:

- U.S. Army;
- U.S. Forest Service and Alabama Forestry Commission;
- Alabama Department of Transportation;
- Calhoun County Department of Transportation;
- City of Anniston, City of Oxford and City of Jacksonville;
- Eastern Alabama Regional Planning and Development Commission; and
- Local realtors.

A summary of past and present actions within and around FMC that have the potential to impact a wide range of resource issues is provided in subsection 5.5.2.1, while reasonably foreseeable future actions are identified in subsection 5.5.2.2. More detailed information regarding past, present and reasonably foreseeable actions that are applicable to a particular resource are described for each resource category in the subsections of 5.5.5.1.

5.5.2.1 Past and Present Actions. Past and present actions within and around FMC have been identified and discussed in detail in Section 4. These actions include on-post and off-post actions. Representative actions include the following:

- Extensive training and range activities that have resulted in the potential for UXO throughout major portions of FMC.

- Training, maintenance, construction, and other past practices that have resulted in the presence of hazardous waste, hazardous materials, and other materials/wastes at sites throughout FMC.

- Military ownership activities that have resulted in range/training induced wildfires as well as reduced logging frequencies, which have maintained the MLP ecosystem on FMC.

- Military ownership that has resulted in the protection of threatened, endangered, and unique species and habitats on FMC property, and the identification, maintenance, and protection of historical and archaeological resources.

- An extensive contiguous forest block is present within the area. This forest block consists of the eastern and southern portions of FMC, the Choccolocco Corridor (Alabama Forestry Commission) and the Talladega National Forest (USDA-FS).

- The overall economy of Calhoun County, as well as the eight-county ROI, has been anchored by the presence of FMC.

- The addition of over 10,000 jobs (primarily lower-paying retail and service sector jobs) in Calhoun County during the previous decade in which the county actually lost population, with the new jobs being filled by people living outside the county.

- The concentration of new growth and development primarily along the I-20 and State Highway 21 corridors, with a corresponding increase in traffic generation and congestion on Highway 21 and other major state, county and city arterials.

- An annual average of approximately 200 new housing units authorized by building permit in Calhoun County, with a total of 300-400 new housing units (not including mobile homes) developed annually (includes those authorized by building permit in incorporated areas and units developed in unincorporated Calhoun County which does not issue building permits);

- Development of the Silver Lakes Golf Course, with a 27-hole course and a 9-hole course which is part of the Robert Trent Jones Golf Trail, into a residential community.

- A modest annual demand for industrial land (30 acres/year) and new office space (10,000 square feet (SF)/year) in Calhoun County.

- Limited industrial operations and modest traffic volumes have resulted in the East Alabama Intrastate Air Quality Control Region (AQCR) being an attainment area for all pollutants.

- Construction activities at FMC have resulted in the establishment of considerable numbers of buildings and related infrastructure throughout the cantonment area. These buildings range from more recently constructed modern training and classroom facilities to historic buildings, constructed during earlier periods in FMC's history.

- FMC currently provides support to Chemical Stockpile Emergence Preparedness Program (CSEPP) at Anniston Army Depot. Key elements of this support includes a variety of elements including, disaster preparedness, environmental cleanup, environmental compliance, safety, police, and emergency response services.

5.5.2.2 Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions include on-post and surrounding community actions. Representative future actions include the following:

- Major transportation improvements, including 1) construction of the Anniston "eastern by-pass" which consists of the widening of Golden Springs Road from two to five lanes from U.S. Highway 78 to Choccolocco Road, and the construction of a new 5.23 mile four-lane road from Choccolocco Road to U.S. Highway 431/Alabama State Highway 21 just north of Summerall Gate; 2) construction of the Anniston "western by-pass", a new four-lane road from I-20 to Alabama State Highway 202; 3) widening of Quintard Avenue (U.S. Highway 431/Alabama State Highway 21) from I-20 to the split of U.S. Highway 431 and State Highway 21 south of Summerall Gate; and 4) the southward extension of Golden Springs Road from I-20 to Friendship Road in Oxford. These projects will result in new development opportunities, modify traffic flow and volume, increase the amount of some air pollutants associated with mobile sources, and may have other project specific, adverse environmental impacts.

- Establishment of a National Center for Domestic Preparedness (NCDP) for training first responders to domestic terrorists acts. The focus of the training would be to prepare State and local officials to deal

with chemical, biological, or nuclear terrorist acts and handle incidents dealing with hazardous materials. The Department of Justice (DOJ) is designated in Senate Report 105-48 as the agency charged with directing and coordinating activities at the Center. DOJ, FMDC, and the Army are working together on proposals and detailed plans of staffing, instruction programs, and facility needs, including the use of the CDTF.

- Establishment of the Mountain Longleaf Wildlife Refuge by the USFWS, in partnership with the ADCNR - GFD, on approximately 10,000 to 12,000 acres of unique habitat within the disposal area. In addition to preserving and enhancing the natural MLP ecosystem, the refuge will help to perpetuate NTMB's; preserve the natural diversity and ecology; and provide recreational opportunities within the refuge.

- Construction of the Chemical Demilitarization Incinerator at the Anniston Army Depot, scheduled for construction during 1997-1999, followed by testing and operations from 1999-2004, which will contribute an estimated $565 million directly to the local/regional economy during its construction and operations/closure periods, with an estimated 800-900 construction employees and 600 operational employees.

- Continuation of commercial and industrial development in the I-20, State Highway 21 and U.S. Highway 78 growth corridors; and residential development in the Saks and Golden Springs neighborhoods, and along the Choccolocco Road corridor.

- The Choccolocco Corridor lease between FMC and the State of Alabama will expire. Management activities for the corridor, by the Alabama Forestry Commission, will continue and are expected to include routine state forest management activities. These multiple use management activities will include silvicultural activities such as timber inventories, tree harvests and thinning, tree planting and prescribed burning; as well as public recreational activities such as bicycle and hiking trails, wildlife viewing areas, camping, hunting, and fishing.

- The Talladega National Forest (Talladega and Shoal Creek Ranger Districts), just east of FMC, will continue to provide multiple-use management in the areas of timber management, recreation (hunting, fishing, camping, swimming, hiking, picnicking), water resources management, and wildlife management. Planned activities within portions of the Shoal Creek District of the Forest, in addition to routine multiple-use activities will include: 1) the reestablishment of MLP to its historical sites, 2) loblolly plantation stocking control, 3) the reclaiming, protecting and enhancing of existing RCW habitat, 4) providing and growing high quality pine sawtimber and maintaining hardwood mast production, 5) managing the area as a wildlife and T&E species corridor between the northern and southern divisions of the Talladega National Forest, 6) providing a diversity of plant and animal communities, 7) maintaining or improving water quality, 8) protecting and enhancing the scenic quality of the forest, and 9) providing multiple use opportunities while meeting remoteness criteria in lands designated as semi-primitive and roadless areas (USDA-FS, 1997).

- The reuse of FMC, as detailed by the FMDC, will include changes to the area including new industrial, commercial, residential, and recreational uses which will influence all resource areas.

- The initial post-closure caretaker status of FMC will have adverse economic impacts on the eight-county ROI with respect to the ability to generate redevelopment revenues and jobs until disposal to new owner(s) is completed.

- Support to CSEPP will continue with the Chemical Biological Defense Command (CBDCOM) activities at Anniston Army Depot by making arrangements for support currently provided by FMC. Selected facilities to support CSEPP are being retained at FMC.

The cumulative impacts analysis incorporates the above issues and considers those actions that can be determined to be reasonably foreseeable.

5.5.3 No Action Alternative - Cumulative Impacts

With the possible exception of infrastructure and specific biological community issues, no cumulative impacts would be expected as result of caretaker status. Infrastructure within the installation will likely deteriorate over time. Adverse effects resulting from reduced upkeep and deterioration of various resources or conditions during caretaker status would cause cumulative impacts on FMC as a whole. Additionally, the reduction or elimination of training related fires will likely have a negative impact on the MLP ecosystem. This impact could be significant if caretaker status occurred for an extended number of years.

5.5.4 Encumbered and Unencumbered Disposal - Cumulative Impacts

- **Encumbered Disposal**. No cumulative effects beyond the impacts discussed in subsection 5.3 would be expected for any of the resource areas. The act of transferring or conveying title in and of itself would not create impacts that could contribute to a cumulative effect for any resource.

- **Unencumbered Disposal**. Unencumbered disposal, as described in subsection 5.3 and subsection 3.3.2, is not reasonable based upon the anticipated significant adverse environmental impacts and interests of the Army. Consequently, as discussed in subsection 5.3.17, unencumbered disposal has been eliminated from further discussion.

5.5.5 Disposal and Reuse - Cumulative Impacts

This subsection presents the cumulative effects analysis for the encumbered disposal and reuse of FMC.

Resource attributes evaluated for cumulative impacts include the fifteen resource categories used to describe the Affected Environment in Section 4, and to describe anticipated impacts in previous discussions in Section 5. These resource categories include:

- land use
- noise
- geology
- ordnance and explosives
- permits and regulatory authorizations
- cultural resources
- economic development
- installation agreements
- air quality
- water resources
- infrastructure
- hazardous and toxic materials
- biological resources
- sociological environment
- quality of life

The cumulative impact analysis, for each of the resource categories, includes the definition of the area that has the potential to be affected by the disposal and reuse actions at FMC. The boundary of the cumulative impact analysis area varies according to the resource evaluation category being considered. For many of the resource categories (e.g. unexploded ordnance, cultural resources, etc.), the impacts are not anticipated to extend beyond the installation boundaries. For those resources, the cumulative impact analysis is limited to the FMC excess lands. For some resource categories (e.g. land use, economics, etc.) the impacts would be expected to extend beyond the installation boundaries; consequently, the impact analysis area for these resources is detailed in the impact discussion for these resources.

5.5.5.1 Medium High Intensity Encumbered Disposal Alternative.

5.5.5.1.1 Introduction. The cumulative impacts associated with the encumbered disposal and MHIR Alternative are presented in the following pages. The MHIR Alternative discussion includes information, including the definition of the analysis area by resource category, that is applicable to (but not repeated in) the discussions of the MIR and MLIR alternatives.

5.5.5.1.2 Land Use.

Analysis Area. The cumulative impact analysis area for land use is defined by the FMC disposal area, adjacent unincorporated Calhoun County, and the adjacent communities of Anniston and Oxford. The greatest direct and indirect impacts of reuse on off-post land use will occur within these immediate environs of FMC.

Cumulative Impacts of Reuse. The cumulative effects of the proposed reuse action on land use include potential impacts to both on-and off-post land use in respect to intensity of development, compatibility with adjacent land uses and supply/demand of developable land.

Land use patterns and intensities under the MHIR Alternative would be basically compatible with adjacent off-base land uses. The majority of the proposed MHIR Alternative commercial areas are located near or adjacent to State Highway 21, which is characterized by predominantly commercial uses. Proposed residential areas and densities are consistent with existing uses and densities within the reuse area, and also compatible with adjacent residential developments.

The proposed MHIR Alternative, however, would result in a significantly higher intensity use over baseline conditions, and would add over 3,000 acres of proposed developable land to the local and regional market. Currently, there are over 200 acres approved for commercial and industrial development in Anniston and Oxford, with a 100-acre site being developed for commercial uses at Golden Springs Road between I-20 and US Highway 78. There are currently in excess of 1,000 acres of vacant industrial land available for development within the adjacent area of Calhoun County, Anniston and Oxford. The majority of current, approved and planned commercial and industrial development is located in the vicinity of I-20 near the Golden Springs and Coldwater exits. An average of 500 to 600 single family housing units, of which 30 to 35 percent are mobile homes, have been constructed annually within the analysis area, with 350 to 400 housing units currently under some stage of pre-construction or construction activity in Anniston and Oxford. The major areas of current and proposed new residential development include the Saks area along US Highway 431 just west of FMC; the Choccolocco road corridor south and east of FMC; the Golden Springs neighborhood in Anniston adjacent on the south of FMC; and areas east and south of Oxford.

In addition to current development underway, and the inventory of commercial and industrial land/space available and approved residential development, reuse of the disposal area under MHIR Alternative would have the following additional direct impacts on land use on FMC and adjacent areas:

- the addition of 228 acres for retail development (including approximately 590,000 SF of retail space);
- the addition of 141 acres for office complexes (including approximately 1,000,000 SF of office space);
- the development of approximately 1,575 single family dwelling units;
- the addition of 924 acres for industrial areas (including approximately 4,500,000 SF of industrial space); and
- the development of 202 acres for a training and educational complex (including approximately 1,100,000 SF of educational and training space).

Potential indirect impacts on adjacent and off-post land use would include the additional demand for housing, supportive commercial, and possibly industrial uses as a result of the development of the FMC reuse area. In addition, the magnitude of potential development of the FMC reuse area could adversely affect the development and marketability of competing areas within the immediate area.

Much of the development presently occurring or projected to occur within the analysis area is located in the unincorporated areas of Calhoun County adjacent to incorporated communities. Fort McClellan is currently an independent non-political entity located in Calhoun County. Since Calhoun County does not have land use, zoning, subdivision regulations or building permits in effect, future development and land use patterns could be jeopardized in the absence of land development regulations and standards.

5.5.5.1.3 Air Quality.

Analysis Area. The analysis area for air quality is the Air Quality Control Region (AQCR) and includes the Fort McClellan disposal area and Calhoun County. Fort McClellan is located in the East Alabama Intrastate AQCR.

Cumulative Impacts of Reuse. Past and present activities are reflected in the affected environment as described in subsection 4.3. Fort McClellan is located in an attainment area for all pollutants. Reasonably foreseeable activities for which emissions can be estimated for the Disposal and Reuse of the Fort McClellan area include mobile sources, fugitive particulate matter from construction, and construction equipment emissions (see subsection 5.4.3). It should be noted that there will also be a decrease in certain air emissions due to the disposal. Fog oil training and Army fire fighting training on Fort McClellan Main Post would be eliminated and prescribed burning would be reduced (see Table 4.7 and Appendix G). For this analysis it was assumed that prescribed burning would decrease by 50% on Main Post and increase by 10% on Pelham Range. Table 5.9 shows the net increase in emissions associated with MHIR Alternative. The increase in emissions is primarily due to mobile sources such as cars and trucks.

Table 5.9 Summary of Net Air Emissions for all Reuse Plans at Fort McClellan

Source	Criteria Pollutants (tons per year)				
	PM-10	SO_X	CO	NO_X	VOC
Medium High Intensity Reuse Alternative					
Total Increase[1]	16.0	9.6	2,915.6	313.9	313.9
Medium Intensity Reuse Alternative					
Total Increase[1]	15.4	8.8	1,534.8	198.1	155.3
Medium Low Intensity Reuse Alternative					
Total Increase[1]	15.0	8.4	761.1	133.2	78.9
Air Emissions Reductions					
Prescribed Burning (MHIR, MIR)	19.3	NC	259.9	3.0	5.2
Prescribed Burning (MLIR)	175.5	NC	2,362.5	27.0	47.3
Fire Fighting Training	1.22	0.076	6.46	0.46	2.28
Fog Oil Training	2.42	0.016	10.2	0.203	239.0
Total Reduction (MHIR, MIR)	22.9	0.1	276.6	3.7	246.5
Total Reduction (MLIR)	179.1	0.1	2,379.2	27.7	288.6
Net Air Emissions Increase					
MHIR Alternative	-6.9	9.5	2,639.0	310.2	44.5
MIR Alternative	-7.5	8.7	1,258.2	194.4	-91.2
MLIR Alternative	-164.1	8.3	-1618.1	105.5	-209.7
EPA Conformity De Minimis Thresholds	100	100	100	100	50

Notes: 1. Increases are from Table 5.1, subsection 5.4.3
CO = Carbon Monoxide

Table 5.9 Summary of Net Air Emissions for all Reuse Plans at Fort McClellan					
Source	Criteria Pollutants (tons per year)				
	PM-10	SO_X	CO	NO_X	VOC
PM-10= Particulate Matter less than or equal to 10 micrometers in diameter SO_X= Sulfur Oxides NOx = Nitrogen Oxides VOC = Volatile Organic Compound					
Source: Parsons Engineering Science, Inc.					

The significance criteria for determining air quality impacts will be based on the USEPA General Conformity Rule de minimis thresholds. Although the General Conformity rule does not apply for an attainment area, the increase in overall emissions is compared to these thresholds as an indication whether the impacts are adverse or significant adverse. If the predicted increase in emissions is less than de minimis thresholds, the impacts are adverse but not significant adverse. Moreover, if the predicted increase in emissions is greater than de minimis thresholds, the impacts are significant adverse. In this case, the predicted emissions for CO and NOx exceed the de minimis thresholds. For example, 2,639 tons per year is greater than the de minimis threshold of 100 tons per year for CO. Therefore there is a long-term significant adverse impact on air quality and mitigation is required. The significant adverse impact is due to the increase in CO and NOx emissions, primarily from mobile sources. The increase in construction dust is offset by a decrease in emissions from, fire fighting training, smoke obscuration training of the chemical school (smoke obscuration training of reserve units on Pelham Range is expected to continue), and prescribed burning (no prescribed burning under the MLIR). Construction equipment emissions are a contributing factor to the CO and NOx emissions, although vehicle emissions are the primary source.

In addition to the primary activities described above that may potentially impact air quality, there are other reasonably foreseeable activities that have been identified which may result in air emissions. They include continued construction of new housing units, continued growth and development within the region, and continuation of the predominance of clean, light industries within the region. These activities reflect the continuing development trends in the region as illustrated in Section 4. One additional reasonably foreseeable activity is the Anniston Chemical Demilitarization Project which will occur at the Anniston Army Depot. Approximately 2,200 tons of chemical agents will be destroyed by four incinerators between 2001 and 2004. Construction of the facility will be completed in 1999 and testing will be completed in 2001. ADEM issued an air permit for the project and compliance with the permit conditions should ensure that significant adverse impacts do not occur as a result of this activity.

Land development and construction, as detailed in subsection 5.5.5.1.2, will produce air emissions. Dust emissions can vary from day to day varying on the type of operations, level of activity, and meteorological conditions. Both the dust emissions associated with construction and construction equipment exhaust emissions associated with construction are temporary and primarily confined to the immediate construction area. Construction related emissions already are part of the existing environment (Section 4) however, the rate of development is increasing. These emissions are not expected to create any significant ambient air quality impacts due to the relatively small quantities of these emissions and the dispersed locations of the construction sites.

There will be an increase in traffic because of the additional development in the area. The Metropolitan Planning Organization has planned multiple highway expansions (e.g. Anniston Eastern and Western Bypasses) to absorb this additional traffic. See subsection 5.5.5.1.7b for additional details on the highway expansions. It is anticipated that the traffic increase will have significant adverse impacts to air quality, which are off-set by decreases in current Army activities except for CO under the MHIR and MIR alternatives.

All stationary air emission sources must comply with both the USEPA Clean Air Act and Alabama Department of Environmental Management regulations, particularly ADEM Chapters 335-3-14, 335-3-15 and 335-3-16 which contain regulations for both construction and operating air permits. These regulations apply to emission sources regardless if the source is Federally, publicly, or privately owned. New industrial sources would likely increase air emissions in the Air Quality Control Region. Because no specific

industrial use proposals have been identified, it is not possible to reasonably estimate the quantities of these emissions, nor predict the ambient air impacts. However, most industry in the region is light industry which typically does not generate large amounts of air emissions. The light industries currently in the region or planning to locate in the region typically are not heavy industries that generate great amounts of air pollution. Most of the heavy industry is located in the Birmingham area. It is unlikely that there would be any significant adverse impacts on air quality (NAAQS exceedances) as a result of these new activities because the operators of any new emission sources would be required to comply with all applicable Federal and state air quality regulations. These regulations are designed to be protective of the environment and are meant to prevent an attainment area becoming a nonattainment area. In addition, stationary air emission sources would be required to comply with any new applicable Federal and state regulations and laws that may result from the revised particulate and ozone NAAQS.

5.5.5.1.4 Noise.

Analysis Area. The analysis area for cumulative noise impacts includes the FMC boundary and those noise zone II and III areas that extend beyond the installation boundary.

Cumulative Impacts of Reuse. The cumulative noise impacts include the positive benefits of decreased noise levels due to the reduction in training activities (training activity related noise will not be eliminated as the ALARNG and Reserve Components will continue to train at Pelham Range and will occupy 409 acres of the Main Post) at FMC. Adverse impacts associated with the potential for changes in traffic volume associated with the development of the eastern by-pass and other roads near FMC are expected. The increase in highway noise may be expected along the eastern by-pass, associated with a shift in traffic to this road, whereas decreases in highway noise may occur along Highway 21 as a result of decreased traffic volume associated with the use of the eastern by-pass instead of the Highway 21.

5.5.5.1.5 Water Resources.

Analysis Area. The analysis area for cumulative impacts to water resources includes all areas that contribute water to Coldwater Spring (located north of the disposal area)as well as all areas contributing surface water to the creeks that exit the disposal area. The recharge area for Coldwater Spring is reported to be over 90 square miles. The disposal area is a small portion of this area.

Cumulative Impacts of Reuse. The recharge area for Coldwater Spring includes large areas that have undergone development in the past as well as areas that are likely to be developed in the foreseeable future. The foreseeable development in the recharge area will result in an increase in the amount of impervious surface. This will result in a decrease in the amount of recharge to the groundwater system and could result in a decrease in the flow of the spring. The development may also lead to increases in contaminants from roadways recharging to the groundwater system and a resultant decline in water quality. The amount of development planned under the reuse is small compared to the entire size of the disposal area and is insignificant compared to the entire recharge area of the spring. MHIR Alternative will result in a minor cumulative long-term adverse impact to water quantity and quality.

5.5.5.1.6 Geology.

Analysis Area. The analysis area for impacts to geology and soils is the disposal area. Activities occurring beyond the boundaries of the disposal area will not impact geology and soils.

Cumulative Impacts of Reuse. All impacts to geology and soils are related to the reuse. It is anticipated that the construction of new buildings, roads, and related infrastructure may have a short-term impact on soil erosion, especially if any of this development occurs in ares with steep slopes.

5.5.5.1.7 Infrastructure

5.5.5.1.7a Infrastructure (Utilities).

Analysis Area. The analysis area for the utility systems is the region served by those utility systems. The confines of the wastewater systems is limited to FMC and the surrounding neighborhoods of Pelham Heights and Lenlock, so the area of analysis is the installation boundary and the neighborhoods surrounding the wastewater treatment plant. The contracted utility components (water, electric, natural gas, communication systems, and solid waste) originate from off-post sources and main feed lines. Therefore their analysis area extends to the areas served by each of those utility systems beyond the boundaries of FMC.

Cumulative Impacts of Reuse. The regional utility systems have sufficient capacity to meet the anticipated demand of the effective population associated with MHIR Alternative at FMC.

To ensure that the wastewater treatment plant has adequate capacity during rainfall events, the infiltration and inflow problems within the collection system at FMC must continue to be addressed. Some industries locating onto FMC may require their own pretreatment or necessitate modifications to the current plant's treatment process. Outside FMC, the wastewater generated from the neighboring communities is not anticipated to cause an undue burden on the treatment plant. If new wastewater treatment provider opted to expand the collection system beyond its current configuration, it would be their responsibility to make adjustments in the treatment plant and permit as necessary. Therefore, no cumulative adverse impacts are anticipated for the wastewater treatment system.

The anticipated water, electric, natural gas, communication systems, and solid waste demands under MHIR Alternative should not put an undue burden on the contracted utility suppliers. Water, energy, communications and solid waste disposal provided by outside sources will be adjusted by the supplier to meet future increased demand that may occur within the analysis area without impacting the environment. As energy efficient facilities replace current facilities the environmental impacts associated with energy usage for the new development will be reduced.

5.5.5.1.7b Infrastructure (Transportation).

Analysis Area. The analysis area for the assessment of the cumulative impacts of reuse on transportation and traffic is Calhoun County, especially the Anniston/Oxford area. This area was selected for analysis since the majority of the traffic origins and destinations associated with reuse of FMC will occur within Calhoun County.

Cumulative Impacts of Reuse. State Highway 21 is the primary arterial directly accessing FMC, and the major north/south arterial in the area. Other important arterials include US Highway 431, US Highway 78, State Highway 202 and I-20, all of which have served to expand urban and suburban development within the area in a radial fashion. Currently, portions of State Highway 21 near FMC are operating at an “E” and “F” LOS with average daily traffics (ADTs) counts exceeding 40,000 per day. The majority of State Highway 21 has ADTs exceeding 30,000 from FMC south to I-20. US Highway 431, although not as congested, has ADTs approaching 25,000 just west of its intersection with State Highway 21. Many of the ADTs along Highway 21 represent a 5-10 percent increase over those recorded in 1992. Thus, improvements to roadway capacity have not kept pace with development and resultant traffic generation.

Under MHIR Alternative, it is estimated that an additional 46,700 net external trips (70,200 - 23,500) would be generated under full build-out. All of this additional traffic would be collected off-base by State Highway 21 under current conditions. A major internal collector roadway which is part of the FMDC reuse plan would also distribute traffic to State Highway 21. As indicated in subsection 5.4.7.3 this additional external traffic would increase by 50 percent above the existing traffic volumes on some segments of Highway 21 without the by-pass improvement Traffic volumes on other arterials (e.g. US Highway 431) would also increase substantially in the absence of major roadway improvements.

The Metropolitan Planning Organization (MPO) of the Calhoun Area Transportation Study (CATS) is

responsible for adopting a yearly Transportation Improvement Program (TIP). The TIP is prepared under the direction of the MPO by the Planning Division of the East Alabama Regional Planning and Development Commission. The TIP guides the Alabama Department of Transportation in its annual allocation of funds for transportation improvements and becomes part of the State TIP. The 1995-1998 TIP for Calhoun County includes 26 projects recommended and proposed for funding. Highway improvement projects currently partially or totally funded include the following:

- the southward extension (two lanes) of Golden Springs Road from I-20 to Friendship Road in Oxford;
- the widening of US Highway 78 in Oxford to 5-lanes from State Highway 21 east to Golden Springs Road;
- the construction of the Anniston Eastern By-Pass (4-lanes) between the Golden Springs exit on I-20 and the intersection of US Highway 431 and State Highway 21 west of FMC (only the southern portion between I-20 and Coleman Road has been funded to date); and,
- the construction of the Anniston Western By-Pass (4-lanes) along the Coldwater Road and Bynum-Leatherwood Road corridors between the I-20 Coldwater exit and US Highway 431 (only the southern portion between I-20 and State Highway 202 has been funded to date).

Completion of the programmed eastern and western by-passes will alleviate current traffic congestion, especially on State Highway 21, and will relieve much of the traffic generated under MHIR Alternative which otherwise would utilize Highway 21.

5.5.5.1.8 Ordnance and Explosives.

Analysis Area. The analysis area for cumulative munitions and ordnance impacts is limited to the FMC boundary, and more specifically to those areas of FMC known or suspected to contain UXO.

Cumulative Impacts of Reuse. UXO clearance, removal, excavation, and detonation activities at locations where residential, commercial, and/or industrial reuse is planned will have an adverse impact on the vegetative communities of the area and will consequently have adverse impacts to all biota. Additionally removal activities may increase soil erosion, especially if removal activities occur on steep slopes. Short-term increases in noise levels is also possible as a result of excavation and detonation activities.

5.5.5.1.9 Hazardous and Toxic Materials.

Analysis Area.. The cumulative impact analysis area for this hazardous and toxic materials includes all areas within the boundaries of FMC.

Cumulative Impacts of Reuse. Subsection 5.4.9 discusses the fact that existing hazardous waste sites at FMC will be investigated and remediated to a level that will match the anticipated reuse. Existing activities at FMC routinely use hazardous, toxic, and radiological materials as well as biological wastes and medical wastes which are a by-product of medical services. Under the MHIR Alternative, the amount of these materials used and generated by the Army will be greatly reduced at FMC. New activities located onto FMC as part of the MHIR Alternative may also use hazardous materials and/or generate hazardous wastes but the amounts are not known at this time. These new activities will be responsible for handling, managing, transporting and disposing of hazardous materials in full compliance with all applicable Federal, state and local regulations. Based on consideration of all past and present, reasonably foreseeable future actions and MHIR, it is anticipated that all hazardous materials and wastes will be handled, stored, transported and disposed of in a manner which protects the environment and human health. No significant adverse impacts would be expected.

5.5.5.1.10 Permits and Regulatory Authorizations.

Analysis Area. Specific permit procedures and requirements serve to define the boundary of areas considered. Existing operating permits are confined to the installation boundaries. Therefore the analysis

area for the cumulative effects of permits and regulatory authorities is the installation boundaries.

Cumulative Impacts of Reuse. Activities within the Army enclave at FMC will continue to comply with all Federal, state and local regulations. Elements of MHIR Alternative that will require new permits and regulatory authority include:

- All proposed actions that result in stationary source air emissions will be addressed during the Title V permit process and evaluated for inclusion; and

- Some of the activities associated with MHIR Alternative will require the new activities to obtain water quality management permits. Some construction will require application for inclusion in the state general stormwater permit.

It is anticipated that the new activities at FMC under MHIR Alternative will operate within all permit conditions and maintain coordination with appropriate regulatory agencies. These activities will be responsible for ensuring that significant adverse impacts to the environment do not occur.

5.5.5.1.11 Biological Resources.

Analysis Area. The analysis area for cumulative analysis of impacts to biological resources includes the current FMC Main Post boundaries, watercourses immediately downstream of the current FMC boundaries, and the Choccolocco corridor that connects FMC to the Talladega National Forest.

Cumulative Impacts of Reuse. Past Army actions at FMC were beneficial to biological resources. Military ownership resulted in range induced wildfires as well as reduced logging frequencies. These activities, combined with the rugged terrain and steep slopes of the Choccolocco Mountains, maintained MLP ecosystem that were lost or degraded at other locations. Army natural resource staff conducted surveys and management programs that documented and maintained SINA, species of conservation concern (SCC), and NTMB habitat. Additionally, the Army lease of the Choccolocco Corridor (the FMC lease will expire in 1999 and the land will remain under Alabama Forestry Commission management), provided a large contiguous section of forest extending from FMC through the Choccolocco Corridor into the National Forest lands east of FMC. This large tract of land is beneficial to NTMB and other species. See Appendix C, particularly subsections C.1.5 through C.1.8, for additional information on how Army ownership and range activities have maintained and enhanced the unique flora and fauna present at FMC. Soil erosion and run-off as a whole to Cane Creek, Cave Creek, and other small streams draining FMC were minimized through Army programs on FMC.

Future activities will result in adverse impacts to biological resources. Cumulative impacts could occur due to highway construction and redevelopment activities. With the exception of the eastern by-pass, a proposed highway that will cross the southwest portion of FMC, the expected future impacts to biological resources due to future activities have been covered in subsection 5.4.11. The highway would encroach upon the Reynolds Hill Turkey Oak SINA and would cause fragmentation of the southwest corner of the MLP forest ecosystem. While the highway would only directly replace approximately 50 acres of forest, the fragmentation caused by the eastern by-pass could reduce the effective size of the MLP ecosystem by approximately 1,200 acres. In addition to the impacts indicated in subsection 5.4.11, the highway would further reduce the amount of unfragmented forest by approximately 400 acres and interior forest by approximately 200 acres. Fragmentation could result in increased nest predation for forest interior NTMB species, particularly those species that nest close to the ground. Fragmentation could also create conditions more favorable for an increase of exotic plant populations. Aggressive exotics could replace SCC and/or other native species of plants. Highway construction would also contribute to increased sediment loading to streams during the construction phase and increased run-off from would be expected over the long-term due to increases in impervious surfaces and automobile traffic. These activities could result in greater stormwater run-off and increased run-off of petroleum hydrocarbons from leaks and spills of automobile fluids.

5.5.5.1.12 Cultural Resources.

Analysis Area. The cumulative impact analysis area for NRHP eligible archaeological sites and historic architectural properties is limited to the FMC excess lands available for disposal and reuse.

Cumulative Impacts of Reuse. No cumulative effects are expected for this reuse plan with application of the historic resources encumbrance and/or mitigation measures. FMC historic properties will either be protected by encumbrances or appropriate mitigation measures will be implemented to reduce adverse effects of their loss or alteration to a minor level. The make up of the encumbrances or the mitigation measures will be determined through section 106 consultations between the Army, the Alabama SHPO, and the ACHP.

5.5.5.1.13 Sociological Environment.

Analysis Area. The analysis area for the cumulative impacts on the sociological environment is the eight-county ROI, and more specifically Calhoun County. This analysis area was selected as the surrounding eight-county area was used as the ROI in the EIFS Model for assessing the sociological impacts of reuse.

Cumulative Impacts of Reuse. Recent population growth within the FMC ROI has been rather stable since 1980 as the region experienced only a one percent increase in population between 1980-90. Current 1995 population estimates indicate a modest growth rate of approximately four percent since 1990. St. Clair County and Cherokee County have experienced the greatest growth since 1980, while Calhoun County and Etowah County had the greatest population losses during the last decade. This overall population loss has been the result of out-migration, in part due to the downsizing at FMC and the Anniston Army Depot, and the lack of employment opportunities, especially higher paying skilled jobs, for the younger population.

Under the MHIR Alternative the daytime population (employees and residents) of the reuse area (FMC installation) would almost double from baseline conditions under full build-out to 17,600. Assuming a certain degree of in-migration of population will occur under this scenario, it is estimated that there will be a net regional population increase of approximately 3,600 after accounting for the out-migration of military personnel and some civilian personnel associated with FMC. This is equal to approximately three percent of the 1990 population of Calhoun County, and less than one percent of the ROI population.

Indirect net impacts include a potential school enrollment increase and additional housing demands. Since these impacts would occur over an extended period of time (e.g. 20 years), the demands on the local school system and housing market would not cause significant adverse impacts to the sociological environment. Police and fire protection services would require some expansion of existing facilities and personnel. No cumulative adverse impacts would occur in respect to environmental justice issues and the homeless programs.

5.5.5.1.14 Economic Development.

Analysis Area. The analysis area for the cumulative impacts of economic development is the eight-county ROI, and more specifically Calhoun County. This analysis area was selected since the surrounding eight-county area was used as the ROI in the EIFS Model for assessing the economic impacts of reuse.

Cumulative Impacts of Reuse. Trends in overall economic development in the eight-county ROI reflect a modest growth rate during the 1985-1995 period, with the civilian labor force increasing approximately 12 percent during this period. The service and retail sectors have increased while manufacturing has decreased in relative importance in respect to job opportunities and employment. Anniston, Oxford and Jacksonville in Calhoun County; Gadsden in Etowah County: and Talladega in Talladega County continue to be the major employment and growth centers in the ROI.

During the 10-year period from 1983-93 period over 10,000 civilian jobs were added in Calhoun County with the majority of this growth in the service and retail sectors. Most of this job growth occurred in the I-20 and State Highway 21 corridors in Oxford and Anniston. Retail sales in Calhoun County increased almost 33 percent during this 10-year period. Personal income, however, has not increased in terms of constant dollars as the local and regional job market continues to be dominated by lower-paying, unskilled jobs.

Military downsizing at Fort McClellan and the Anniston Army Dept during this period, however, resulted in substantial losses in government employment. Fort McClellan, however, still remains the largest employer in the ROI and has been an economic engine for employment creation, business and higher paying jobs. Activities at the installation are directly and indirectly responsible for over $200 million in annual business sales; 1,755 jobs; and $178 million in annual income.

Post-closure caretaker status will result in the inability to begin redevelopment to compensate for the loss of military and civilian jobs, and business sales associated with the closure of FMC. However, reuse of the disposal area under MHIR at full build-out would result in a net employment increase of 9,584 on the installation, and a net increase of approximately 5,000 direct and indirect jobs in the retail, service and industrial sectors. Direct and indirect business sales volume would increase by $574 million annually, while direct and indirect personal income would increase by approximately $78 million annually. Other indirect economic benefits include increases in the real property tax base, and property and sales tax revenues. In addition, economic benefits would accrue from the one-time construction of the proposed reuse facilities in the form of direct and indirect job creation, business sales and personal income.

5.5.5.1.15 Quality of Life.

Analysis Area. The analysis area selected for the assessment of cumulative impacts on quality of life issues is Calhoun County, especially the communities of Anniston and Oxford. This area was chosen as the majority of any quality of life impacts associated with reuse of the disposal area will be primarily within the more immediate environment of FMC.

Cumulative Impacts of Reuse. Direct impacts will accrue to the local school system in the form of potential increased enrollment resulting from the reuse activity and projected in-migration of population. A short-term adverse impact associated with increased enrollment could result in overcrowding and necessitate the construction of new school facilities. Under MHIR Alternative it is estimated that there will be a net enrollment increase of over 1,100 students - an approximate six percent increase over current enrollment levels. It is anticipated that the majority of this enrollment increase will occur in the Anniston and Calhoun County public school systems. These two school systems will lose over $600,000 in Federal Impact Aid funds as a result of the loss of the school-age dependents of the military personnel. However, the loss of these federal funds will more than be off-set by the addition of the reuse area to the local property tax rolls and the subsequent collection of tax revenue by the local school systems. It is anticipated that any new facilities and personnel required to meet the additional enrollment demands can be financed by the new tax revenues.

The projected demand for an additional 3,600 housing units could result in a housing shortage within the region, especially in Calhoun County and the communities of Anniston and Oxford. However, this demand should be accommodated without any adverse impacts since full build-out of the reuse area is projected to occur over a 20-year time period.

No major impacts are anticipated in respect to public and family support services as increased tax revenues would be available to finance any needed expansion of these services. Current recreational and open space resources are sufficient to accommodate future additional demands. However, visual and aesthetic resources within and adjacent to the reuse area could be adversely impacted by modification/destruction of resources within the reuse area and from potentially more intense development.

5.5.5.1.16 Installation Agreements.

Analysis Area. The analysis area for cumulative installation agreements impacts includes the FMC boundary and those areas that extend beyond the installation boundary where external support to others, by FMC, was agreed upon based on existing agreements.

Cumulative Impacts of Reuse. Most of the non-DOD agreements are associated with easements with utility companies. However, minor cumulative impacts would be expected associated with the services currently provided by FMC in support of CSEPP. Anniston Army Depot will make arrangements for CSEPP support currently provided by FMC. Selected facilities at FMC to support CSEPP are being retained. Medical, ambulance, and related services associated with the agreements will need to be provided by another source.

5.5.5.2 Medium Intensity Reuse Encumbered Disposal Alternative.

5.5.5.2.1 Introduction. Implementation of this scenario would result in effects that would be similar to those under the MHIR Alternative, but on a lesser scale. Noteworthy differences between the MHIR and MIR alternatives are presented in the following paragraphs.

5.5.5.2.2 Land Use. In addition to development underway, and the current inventory of commercial and industrial land/space and approved residential development, reuse of the disposal area under the MIR Alternative would have the following additional direct impacts on land use on FMC and adjacent areas:

- the addition of 228 acres for retail development (including approximately 400,000 SF of retail space);
- the addition of 141 acres for office complexes (including approximately 747,000 SF of office space);
- the development of approximately 1,245 single family dwelling units;
- the addition of 924 acres for industrial areas (including approximately 3,863,000 SF of industrial space); and
- the development of 202 acres for a training and educational complex (including approximately 847,000 SF of educational and training space).

Potential indirect impacts on adjacent and off-post land use would include the additional demand for housing, supportive commercial, and possibly industrial uses as a result of the development of the FMC reuse area. In addition, the magnitude of potential development of the FMC reuse area could adversely affect the development and marketability of competing areas within the immediate area.

5.5.5.2.3 Air Quality. This plan has the same amount of land in comparison to the MHIR Alternative, but the intensity for reuse is reduced. As a result, the quantity of new stationary air sources to relocate in the area is reduced. The quantity of overall air emissions associated with this alternative would be slightly less than MHIR Alternative. For this analysis it was assumed that prescribed burning would decrease by 50% on Main Post and increase by 10% on Pelham Range. Table 5.9 shows the net increase in emissions associated with the MIR Alternative. The average daily trips are approximately 68% of the MHIR Alternative, thus the predicted emissions are significantly reduced. However, they are still well above the USEPA General Conformity Rule de minimis thresholds. A long-term significant adverse impact would be expected and mitigation is required primarily due to mobile sources.

5.5.5.2.4 Noise. Implementation of the MIR Alternative would result in similar impacts to those discussed in the MHIR Alternative in subsection 5.5.5.1.4.

5.5.5.2.5 Water Resources. The cumulative impact of implementation of the MIR Alternative would be similar to those described in subsection 5.5.5.1.5 for the MHIR Alternative. The magnitude of the cumulative impacts would be lessened due to the lower intensity of the reuse.

5.5.5.2.6 Geology. Implementation of the MIR Alternative would result in similar impacts to those discussed for the MHIR Alternative in subsection 5.5.5.1.6. The magnitude of the cumulative impacts

would be lessened due to the lower intensity of the reuse.

5.5.5.2.7 Infrastructure

5.5.5.2.7a Infrastructure (Utilities). Implementation of the MIR Alternative, in combination with the past and present actions, and reasonably foreseeable future actions previously identified will result in the same cumulative impacts as discussed in subsection 5.5.5.1.7. As described in subsection 5.5.5.1.7, there are no significant adverse cumulative impacts anticipated due to the added demand on infrastructure.

5.5.5.2.7b Infrastructure (Transportation). Under the MIR Alternative it is estimated that an additional 24,340 net external trips (47,840 - 23,500) would be generated under full build-out. All of this additional traffic would be collected off-base by State Highway 21 under current conditions. As indicated in subsection 5.4.7.3 this additional traffic would result in an approximate 25 percent increase in existing traffic volumes on some segments of Highway 21. Traffic volumes on other arterials (e.g. US Highway 431) would also increase in the absence of major roadway improvements.

5.5.5.2.8 Ordnance and Explosives. Implementation of the MIR Alternative would result in similar impacts to those discussed in the MHIR Alternative in subsection 5.5.5.1.8.

5.5.5.2.9 Hazardous and Toxic Materials. Implementation of the MIR Alternative, in combination with the past and present actions, and reasonably foreseeable future actions previously identified will result in the same cumulative impacts as discussed in subsection 5.5.5.1.9. As described in subsection 5.5.5.1.9, there are no significant adverse cumulative impacts anticipated due to the added generation or use of hazardous and toxic materials.

5.5.5.2.10 Permits and Regulatory Authorizations. Implementation of the MIR Alternative, in combination with the past and present actions, and reasonably foreseeable future actions previously identified will result in the same cumulative impacts as discussed in subsection 5.5.5.1.10. As described in subsection 5.5.5.1.10, there are no significant adverse cumulative impacts anticipated due to the added demand on permits and regulatory authorities.

5.5.5.2.11 Biological Resources. Implementation of the MIR Alternative would result in similar impacts to those discussed for the MHIR Alternative in subsection 5.5.5.1.11 for terrestrial species, but on a slightly lesser scale for aquatic species.

5.5.5.2.12 Cultural Resources. No cumulative effects are expected under this reuse alternative. Considerations relevant to the MHIR Alternative would apply to the less intense development of the MIR Alternative.

5.5.5.2.13 Sociological Environment. Under the MIR Alternative the daytime population of the reuse area would increase approximately 32 percent from the baseline level. Even though it is assumed that there will some in-migration of population under this scenario, there will be a net population decrease of 5,272 because of the out-migration of the military and some civilian personnel currently stationed or employed at FMC. Indirect net impacts include a corresponding decrease in school enrollment, housing and public service demands resulting from reuse activities.

5.5.5.2.14 Economic Development. Economic benefits accruing to the region under the MIR Alternative would be approximately one-half the magnitude of benefits under the MHIR Alternative. Reuse of the disposal area under the MIR Alternative at full build-out would result in a net employment increase of 4,587 on the installation, and a net increase of 2,633 direct and indirect jobs in the retail, service and industrial sectors. Direct and indirect net business sales volume would increase by $294 million annually, while total direct and indirect personal income would increase by approximately $40 million annually. In addition, economic benefits would accrue from the one-time construction of the proposed reuse facilities in the form of direct and indirect job creation, business sales and personal income. However, these benefits would be approximately one-third less than under the MHIR Alternative.

5.5.5.2.15 Quality of Life. No impacts would be expected as there would be a net decrease in school enrollment compared to baseline conditions, while the increased demand for owner-occupied housing could be accommodated by the local and regional housing market.

5.5.5.2.16 Installation Agreements. Minor cumulative impacts would be expected. The services associated with FMC support to CSEPP will need to be arranged by Anniston Army Depot. Selected facilities at FMC to support CSEPP are being retained. Medical, ambulance and related services associated with the agreements will need to be provided by another source.

5.5.5.3 Medium Low Intensity Encumbered Disposal Alternative.

5.5.5.3.1 Introduction. Implementation of this scenario would result in effects that would be similar to those under the MHIR and MIR alternatives, but on a lesser scale. Noteworthy differences between the MHIR and MIR alternatives and the MLIR Alternative are presented in the following paragraphs.

5.5.5.3.2 Land Use. In addition to development underway, and the current inventory of commercial and industrial land, and approved residential development, reuse of the disposal area under the MLIR Alternative would have the following additional direct impacts on land use on FMC and adjacent areas:

- the addition of 228 acres of retail development (including approximately 315,000 SF of retail space);
- the addition of 141 acres for office complexes (including approximately 618,000 SF of office space);
- the development of approximately 1,150 single family dwelling units;
- the addition of 924 acres for industrial development (including approximately 3,219,000 SF of industrial space); and
- the development 202 acres for a training and educational complex (including approximately 706,000 SF of educational and training space).

Potential indirect impacts on adjacent and off-post land use would include the additional demand for supportive commercial, and possibly industrial uses as a result of the development of the FMC reuse area.

5.5.5.3.3 Air Quality. This plan has the same amount of land in comparison to the MHIR and MIR alternatives, but the intensity for reuse is reduced. As a result, the quantity of new stationary air sources to relocate in the area is reduced. The quantity of overall air emissions associated with this alternative would be less than both the MHIR and MIR alternatives. For this analysis it was assumed that prescribed burning would be eliminated. Table 5.9 shows the net increase in emissions associated with the MLIR Alternative. The average daily trips are approximately 50% of the MHIR Alternative, thus the predicted emissions are significantly reduced from the MIR Alternative. Based on a smaller increase in traffic in conjunction with the elimination of prescribed burning, NOx is the only pollutant that would exceed the USEPA General Conformity Rule de minimis thresholds. The anticipated annual increase is only marginally greater than the de minimis thresholds (105.5 tons compared to 100 tons). However, by definition, the impact must be classified as a long-term significant adverse impact. Mitigation is required, primarily because of mobile sources, although this Alternative has less adverse impacts to air quality compared to the MHIR and MIR alternatives.

5.5.5.3.4 Noise. The cumulative impact of implementation of the MLIR Alternative would be similar to those described in subsection 5.5.5.1.4 for the MHIR Alternative.

5.5.5.3.5 Water Resources. The cumulative impact of implementation of the MLIR Alternative would be similar to those described in subsection 5.5.5.1.5 for the MHIR Alternative. The magnitude of the cumulative impact would be lessened due to the lower intensity of the reuse.

5.5.5.3.6 Geology. The cumulative impact of implementation of the MLIR Alternative would be similar to those described in subsection 5.5.5.1.6 for the MHIR Alternative. The magnitude of the cumulative impact would be lessened due to the lower intensity of the reuse.

5.5.5.3.7 Infrastructure

5.5.5.3.7a Infrastructure (Utilities). Implementation of the MLIR Alternative, in combination with the past and present actions, and reasonably foreseeable future actions previously identified will result in the same cumulative impacts as discussed in subsection 5.5.5.1.7. As described in subsection 5.5.5.1.7, there are no significant adverse cumulative impacts anticipated due to the added demand on infrastructure.

5.5.5.3.7b Infrastructure (Transportation). Under the MLIR Alternative it is estimated that an additional 11,820 net external trips (35,320 - 23,500) would be generated under full build-out. All of this additional traffic would be collected off-base by State Highway 21 under current conditions. As indicated in subsection 5.4.7.3 this additional traffic would increase existing traffic volumes by approximately 15 percent or more on some segments of Highway 21. Traffic volumes on other arterials (e.g. US Highway 431) would also increase in the absence of major roadway improvements.

5.5.5.3.8 Ordnance and Explosives. The cumulative impact of implementation of the MLIR Alternative would be similar to those described in subsection 5.5.5.1.8 for the MHIR Alternative.

5.5.5.3.9 Hazardous and Toxic Materials. Implementation of the MLIR Alternative, in combination with the past and present actions, and reasonably foreseeable future actions previously identified will result in the same cumulative impacts as discussed in subsection 5.5.5.1.9. As described in subsection 5.5.5.1.9, there are no significant adverse cumulative impacts anticipated due to the added demand on hazardous and toxic materials.

5.5.5.3.10 Permits and Regulatory Authorizations. Implementation of the MLIR Alternative, in combination with the past and present actions, and reasonably foreseeable future actions previously identified will result in the same cumulative impacts as discussed in subsection 5.5.5.1.10. As described in subsection 5.5.5.1.10, there are no significant adverse cumulative impacts anticipated due to the added demand on permits and regulatory authorities.

5.5.5.3.11 Biological Resources. Implementation of this alternative would result in effects that would be similar to those under the MIR Alternative for terrestrial species, but on a slightly lesser scale for aquatic species.

5.5.5.3.12 Cultural Resources. No cumulative effects on cultural resources are expected under this reuse alternative. Considerations relevant to the MHIR and MIR alternatives would apply to the less intense MLIR Alternative.

5.5.5.3.13 Sociological Environment. Under the MLIR Alternative the daytime population of the reuse area would increase by only 372 above baseline conditions, while regional population would decrease by over 9,500. Indirect net impacts include commensurate decreases in housing and public service demands when compared to the MHIR and MIR Alternatives.

5.5.5.3.14 Economic Development. Economic benefits accruing to the region under the MLIR Alternative would be approximately one-fourth the magnitude of benefits under the MHIR Alternative. Reuse of the disposal area under the MLIR Alternative at full build-out would result in a net employment increase of 1,647 on the installation, and a net increase of approximately 1,150 direct and indirect jobs in the retail, service and industrial sectors. Direct and indirect business sales volume would increase by $128 million annually, while total direct and indirect personal income would increase by approximately $18 million annually. In addition, economic benefits would accrue from the one-time construction of the proposed reuse facilities in the form of direct and indirect job creation, business sales and personal income. However, these benefits from construction activity would be approximately one-half the magnitude of the benefits under the MHIR Alternative.

5.5.5.3.15 Quality of Life. As discussed in subsection 5.5.5.2.15 for the MIR Alternative, no impacts would be expected as there would be a net decrease in school enrollment compared to baseline conditions, while the demand for owner-occupied housing could be accommodated by the local and regional housing market.

5.5.5.3.16 Installation Agreements. Minor cumulative impacts would be expected. The services associated with FMC support to CSEPP will need to be arranged by Anniston Army Depot. Selected facilities at FMC to support CSEPP are being retained. Medical, ambulance and related services associated with the agreements will need to be provided by another source.

5.6 MITIGATION SUMMARY

5.6.1 No Action Alternative

As discussed in subsection 5.2, the No Action Alternative could, or in some areas would be expected to, create impacts adversely affecting land use, infrastructure, installation agreements, and economic development.

The longer FMC were to remain in caretaker status, the greater would be the potential for the predicted adverse impacts to affect various resources. The Army would implement the following mitigation measures to reduce or avoid adverse impacts associated with caretaker status as they might occur:

- Conduct installation security and maintenance operations to the extent provided by Army policies and regulations for the duration of the caretaker period, and transfer responsibilities for these functions to non-Army entities as soon as practicable to minimize disruption of service.

- Identify clean or remediated portions of the installation for disposal and reuse and prioritize restoration and cleanup activities to ensure timely disposal and reuse of remaining portions. Recycle solid wastes and debris where practicable.

- Utilize natural attenuation for environmental remediation at appropriate sites wherever there is no imminent threat to human health or the environment.

- Continuation of natural resources management programs including, endangered species management plan provisions, integrated natural resources management plan provisions, land management, pest control, forest management, and erosion control, but at reduced levels. Additionally, agreement with other Agencies would be sought to maintain the mountain longleaf pine (MLP) ecosystem through the continuation of prescribed burns and other management procedures. Continue close coordination with other federal agencies such as the USFWS and state agencies.

- Continued compliance with historic preservation laws and regulations.

- Actively support interim leasing arrangements, where environmental restoration efforts permit, to provide for job creation, habitation and maintenance of structures, and rapid reuse of the installation.

5.6.2 Disposal

Based upon a review of the impacts described in the preceding subsections, it is concluded that unencumbered disposal is not reasonable based upon the anticipated adverse environmental impacts and the interests of the Army. Therefore, the encumbered disposal alternative is the preferred Army action. This action will result in disposal actions that are timely, support Army requirements, and are compatible with the FMDC Reuse Plan.

To avoid, reduce, or compensate for adverse impacts that might occur as a result of encumbered disposal, the Army would:

- Transfer property with covenants, restrictions or notices, as appropriate, for residual environmental contamination, lead base paint, asbestos, UXO clearance actions, protection of historic and cultural resources, and protection of the gray bat.

- Continue required cleanup process and remedial actions.

- Complete EE/CA and any necessary UXO investigations to delineate the extent of UXO on excess FMC property and provide recommendation/notification regarding removal actions and use restrictions.

- Retain federal ownership of property where clearance/removal of UXO would cause significant adverse

and unacceptable ecological damage.

- Continue to work with the FMDC to ensure that, to the maximum extent feasible, encumbered disposal transactions are consistent with the adopted community reuse plan and implementation strategy.

- Prior to final disposal, conduct complete cultural resources surveys of FMC property to the maximum extent possible so as to ensure no adverse effects on the resource that might be present.

- Until final disposal, maintain installation buildings, infrastructure, and natural resources in caretaker status to the extent provided by Army policy and regulations.

Conveyance documents would notify future owners of the property of particular obligations concerning natural and cultural resources that would be imposed as a result of the Army's determination of the applicability of an encumbrance. Conveyance documents would also identify past hazardous substance activities at each site, as required by CERCLA and CERFA and identify restrictions associated with non-CERCLA hazards such as radon and lead based paint.

5.6.3 Reuse

The Army does not propose the implementation of specific mitigation actions for intensity-based reuse scenarios. This is appropriate because reuse planning and execution of redevelopment actions are a responsibility of non-Army entities. The following identifies general mitigation actions that could be implemented by other parties for the reduction, avoidance, or compensation of impacts resulting from their actions. Potential mitigation actions are suggested for those resource areas most likely to be affected by adverse impacts as a result of reuse.

- **Land Use (Land Development Controls).** Appropriate measures to mitigate any potential adverse impacts associated with development of FMC to a level intensity equal to MHIR Alternative include the application of land development controls and planning/design standards by the appropriate governing jurisdiction, whether it be the City of Anniston or Calhoun County. Such mechanisms include zoning and subdivision controls, site and grading plan review, and building permit review and approval procedures. Lot size, density, open space, landscaping, circulation, building bulk/appearance and other elements of the development could be controlled through use of these regulations and procedures.

- **Land Use (Slope and Soil Stability).** Reuse restrictions on the development of areas with steep slopes and/or highly erodible soils would reduce direct and indirect impacts associated with redevelopment activities where soils are disturbed in association with construction, demolition, site remediation or UXO clearance activities. Slope analysis at FMC has revealed that over 10,000 acres of FMC land has slopes greater than 15%. As presented in the FMC Comprehensive Reuse Plan Existing Conditions Report (FMRRA, 1996), slopes greater than 25% are constrained for development whereas slopes between 15 and 25% can be developed as long as careful consideration is given to the size and placement of buildings and roads. In addition to the steep slopes throughout portions of FMC, approximately 80% of the disposal area is comprised of highly erodible soils which does not lend itself to construction without proper erosion management practices.

  Since large portions of FMC contain steep slopes and highly erodible soils, restrictions on the development within these areas would mitigate impacts associated with soil erosion, siltation, and habitat loss.
- **Air Quality.** The air permit process established by the Clean Air Act (CAA) and the Alabama Department of Environmental Management provides effective controls over new stationary sources. Adherence to the provisions of the CAA and State Regulations would prevent any significant adverse impacts from stationary sources. Application of best management practices could be used to control fugitive dust (particulate) during construction. Two potential approaches to control construction dust include applying water or dust suppressants and/or planting of plants and grass to the disturbed areas.

For mobile sources, a comprehensive air quality analysis should be conducted for each highway/road expansion and for each existing highway/road that experiences a significant increase in Average Daily Traffic. The goal is to reduce vehicle miles traveled and to reduce congestion during peak hours. The air quality analysis should include dispersion modeling using an approved model to determine if a NAAQS will be exceeded. All air quality analyses should be coordinated with both the Alabama Department of Environmental Management and the Alabama Department of Transportation. Additional possible mitigation measures include implementing trip reduction plans, promoting car and van pooling, using economical vehicles, improving highways, and revising work schedules. Other measures include using public transportation, improving road intersection control, and constructing bicycle paths.

- **Water Resources.** Application of best management practices to reduce sediment loading to surface waters could aid in reducing impacts on water quality. Construction of storm water detention/retention systems could help mitigate impacts associated with storm water runoff from impervious surfaces.

- **Geology.** Disturbance of highly erodible soils, especially those soils associated with the steep slopes on the eastern portions of FMC, should be avoided wherever possible. Should these or other soil types be disturbed, desilting basins, sediment traps, silt fences, straw barriers, and other erosion control measures could be constructed.

- **Ordnance and Explosives.** Comply with deed covenants on land uses which implement the recommendations from the EE/CA and DDESB decisions, regarding UXO removal activities and land use restrictions (institutional controls) imposed as part of the land transfers.

- **Hazardous and Toxic Materials.** Comply with all applicable Federal, state, and local regulations and permit requirements for use of hazardous and toxic materials. Encourage redevelopment activities and industries that are environmentally friendly.

- **Biological Resources (General).** Adverse impacts on biological resources would occur primarily as a result of construction. Two principal measures for conservation of significant biological resources are ensuring consultation with natural resources experts and regulatory agencies prior to initiating actions and implementing best management practices in association with approved construction projects. Operational controls could also be applied to minimize any adverse effects of noise and light on sensitive biological resources.

- **Biological Resources (Mountain Longleaf Pine Ecosystem).** Adverse impacts to the Mountain Longleaf Pine (MLP) community could be mitigated via the implementation of a management program. Elements of the plan would include the following elements:

    1) The use of prescribed burns to assure the continued long-term viability of this ecosystem (see Appendix C for additional details on the MLP ecosystem). The prescribed burn program will need to provide a fire regime similar to that occurring at FMC under preclosure conditions (i.e. the prescribed burns will require fires of sufficient frequency, intensity, duration, season, and geographic extent to equate to the fires historically caused by the training activities and the prescribed burn program at FMC). Completion of Auburn University MLP survey of FMC will provide additional information to augment the management of the MLP ecosystem.

    2) Direct forest management activities toward the reestablishment of MLP in historic locations, currently containing other species that have replaced MLP due to fire suppression or planting of other species.

    3) Establishment of the Mountain Longleaf Wildlife Refuge at FMC would assure the implementation of a vigorous management program including prescribed burning for the MLP ecosystem as well as the management for other biological resources including NTMB's; rare, threatened, and endangered species; and overall ecosystem diversity.

- **Biological Resources (Threatened and Endangered Species).** Implement the reuse Project Design Features (PDFs) detailed in the Biological Assessment (BA) and the additional protective measures described in the July 1998 letter from the USACE to the USFWS, resulting from informal consultation with the USFWS.

- **Biological Resources (Other Species of Concern).** Management practices that would maintain populations of other species of concern could include the establishment of buffer areas around SINAs and known populations. For the WFO populations, prescribed burns for the MLP ecosystem and watershed protection to maintain the recharge area for the seeps will benefit the WFO.

- **Socioeconomic Resources.** No mitigation is necessary. Mitigation of any potential adverse impacts would be partially accomplished through phased implementation of the development of the reuse area. A 20-year build-out period is anticipated for the reuse area, which will result in gradual development of the area with the impacts absorbed over a period of time.

5.7 ENVIRONMENTAL JUSTICE SUMMARY

On February 11, 1994, the President issued Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations,* and on April 21, 1997 he issued Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. These orders require that federal agencies conduct their programs, policies, and activities that substantially affect human health or the environment so that there are not disproportionately high and adverse human health or environmental effects on children, or on minority and low-income populations.

The Army's proposed action is not designed to create a benefit for any group or individual. As part of the screening process, entities may express interest in installation assets to provide assistance to homeless persons. FMDC has signed an agreement with the Homeless Alliance of Calhoun County in allocating 14 buildings in the 1200 Area for homeless use. The FMDC Reuse Plan (Fort McClellan Comprehensive Reuse Plan, Homeless Assistance Application - FMRRA, 1997f) must accommodate expressions of homeless interests accepted by Human Health Services and be approved by the Department of Housing and Urban Development (HUD).

Disposal and reuse of FMC will not cause disproportionately high or adverse human health or environmental impacts on children or minority/low-income populations of the surrounding community. Review and evaluation of economic and social information from statistical data sources (e.g. U.S. Census) have not disclosed the existence of identifiable minority or low-income "pockets" or communities within the immediate vicinity of FMC.

5.8 CLEAN AIR ACT CONFORMITY

Under the authority of the CAA and resultant regulations , the USEPA has divided the country into geographical regions known as Air Quality Control Regions (AQCRs) to evaluate compliance with the NAAQS. There are primary NAAQS for protection of public health and there are secondary NAAQS for the protection of public welfare. FMC is under the jurisdiction of the USEPA Region IV and is located within Calhoun County in the East Alabama Intrastate AQCR. The East Alabama Intrastate AQCR is classified as attainment for all criteria pollutants.

There are two independent legal requirements which are used to determine air quality impacts. The first governing requirement is the National Environmental Policy Act (NEPA) and the second is the General Conformity Provision per the CAA, Section 176. Fulfillment of one requirement does not fulfill the other requirement, nor does the exemption of one automatically exempt the other. NEPA requires consideration of the direct and indirect effects of an action on the environment through a prescribed documented process. Completion of this EIS fulfills the NEPA air quality analysis requirements.

Federal Regulations (40 CFR, Part 51, Subpart W) establish General Conformity requirements for Federal facilities to ensure that activities do not adversely affect the State Implementation Plan goals. Conformity is aimed at preventing a Federal action from contributing or causing a violation of the NAAQS, from increasing the frequency of an existing violation, or delaying the timely attainment of a standard. At one time, USEPA considered implementing conformity requirements for attainment areas, however, the National Highway System Designation Act of 1995, Section 305 (Public Law 104-59) modified the CAA, Section 176 preventing the applicability of General Conformity to attainment areas. Since Fort McClellan is located in an attainment area for all criteria pollutants, the General Conformity Rule does not apply.

5.9 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

The following paragraphs identify adverse environmental impacts that cannot be avoided in connection with the no action, encumbered disposal, and unencumbered disposal alternatives.

5.9.1 No Action

Notwithstanding Army efforts to maintain the installation's assets, deterioration of FMC facilities would occur as a function of age. Post-closure caretaker status would result in the inability to begin redevelopment activities to compensate for the loss of jobs and attendant adverse impacts on socioeconomics in the region of influence that would occur as a result of the closure of the installation.

5.9.2 Encumbered Disposal

Several encumbrances applicable to FMC, taken together, would impede redevelopment of the FMDC portions of the installation. Removal of many of these encumbrances ultimately would occur (e.g., the Army would eventually be able to certify that certain parcels have been remediated in accordance with CERCLA and CERFA). Predictions are not available for how quickly the FMDC would be able to redevelop the installation in the absence of such encumbrances.

5.9.3 Unencumbered Disposal

Without encumbrances, transfer of the property would involve no deed-recorded limitations to reuse, although new property owners would still be subject to laws and regulations at the federal, state, and local levels. Based on the FMDC reuse plan, the reuse alternatives could involve numerous adverse impacts. The degree to which these impacts would be unavoidable cannot be presently determined because the future reuse actions would be by non-Army entities in ways not presently defined to the degree necessary to quantify impacts. However, a variety of unavoidable impacts associated with unencumbered disposal can be identified in general terms. These impacts include the following:

- **UXO Clearance.** Unencumbered disposal would require the removal of all UXO from the disposal area. The extent of environmental damage resulting from the UXO removal process will be directly associated to the location, linear and vertical extent, type(s), and amount of UXO within the disposal area. The Environmental Baseline Survey (EBS) and the BRAC Ordnance Ammunition and Explosives Archive Search both indicate that much of the disposal area has the potential for UXO. Based upon these studies it is anticipated that significant UXO removal may be required under the UD Alternative. Consequently, significant adverse environmental impacts are anticipated including the loss of plant communities. This includes the MLP ecosystem, SINA's, riparian habitats and other biological systems in the disposal area. Soil loss and erosion associated with the clearance activities would also adversely impact the wetland and aquatic systems via increased siltation and habitat loss.

- **Hazardous and Toxic Materials Remediation.** The UD Alternative would require the cleanup of all contamination to the cleanest levels possible (e.g. any contaminated groundwater would need to be cleaned up to drinking water standards) or would require that the new owner(s) agree to complete cleanup to the satisfaction of the regulatory agencies. Cleanup to these standards would be expensive and time consuming and thereby delay the transfer and reuse of some parcels until the cleanup is complete. Cleanup would exceed requirements based on FMDC reuse plan (e.g., industrial areas would be remediated to residential use levels). This will delay reuse activities and could significantly increase costs to the taxpayers.

- **Threatened and Endangered Species.** Under the UD Alternative habitat for the gray bat would not be protected which could result in adverse impacts to this species.

- **Cultural Resources.** Under the UD Alternative, long-term minor adverse impacts would be expected. FMC NRHP eligible properties would be adversely effected by the withdrawal of federal protection. If FMC historic properties are disposed of without preservation covenants, the Army, Alabama SHPO, and the ACHP will consult, in accordance with Section 106 of the NHPA, to determine appropriate mitigation measures for treating the potential degradation or loss of these properties. The adverse impacts of UD disposal of FMC historic properties would thus be reduced to a minor level by implementing these agreed upon mitigation measures.

- **Access Easements.** Under the UD Alternative access easements providing access by the ALARNG and Army Reserves to lands being retained by the Army for their use, as well as to hazardous waste remediation sites and UXO clearance sites would not be required. Consequently, adverse impacts associated with the inability to readily access these properties could occur.

The presentation of suggested mitigation actions in subsection 5.6 serves as a starting point so that subsequent owners can avoid generating adverse impacts during reuse.

5.10 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCE

Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects that use of these resources will have on future generations. Irreversible effects primarily result from use or destruction of a specific resource (e.g., energy and mineral) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species).

The No Action Alternative and disposal alternative will not result in any irreversible or irretrievable commitment of resources. Reuse, however, could result in irreversible or irretrievable commitments of resources if land development either physically eliminated rare or endangered plant or animal species, or if subsequent secondary impacts from land development resulted in defilement of natural resources immediately adjacent to committed developed areas.

5.11 SHORT-TERM USES OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term uses of the biophysical components of man's environment include construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than five years. Long-term uses of man's environment include those impacts occurring over a period of more than five years, including permanent resource loss.

Several kinds of activities could result in short-term resource uses that compromise long-term productivity. Filling of wetlands or loss of other especially important habitats, conversion of prime or unique farmlands to nonagricultural use, and consumptive use of high-quality water at non-renewable rates are examples of actions that affect long-term productivity.

Disposal of FMC, encumbered or unencumbered, would facilitate long-term productivity by allowing future economically beneficial reuse of the property. The No Action Alternative would hinder long-term economic productivity by restricting future development. Under all the reuse scenarios, future construction would have temporary adverse effects on air quality, storm water runoff, noise, traffic circulation and roadways, energy consumption, and aesthetics. Short-term disturbances of previously undisturbed sensitive biological habitats could result from construction of new facilities, which could cause long-term reductions in biological productivity.

List of Preparers

This Environmental Impact Statement was prepared under the direction of the U.S. Department of the Army, Training and Doctrine Command; and the U.S. Army Corps of Engineers, Mobile District. A list of persons who participated in the preparation of this document is presented below.

Name	Education and Experience	Primary Responsibilities
Robert B. Bax	B.S. Forestry; M.S. Recreation & Park Administration; 20 years experience in environmental, urban/regional, recreation and military planning projects.	Principal-In-Charge; planning and general supervision of all work elements.
Gregory W. Knauer	B.A. Zoology; M.S. Aquatic Ecology; 20 years experience in environmental planning, water quality investigation, and military master planning projects.	Project Manager/Principal Scientist; coordination of technical elements and analysis; coordination and review of document preparation.
Richard E. Hall	B.S. Environmental Biology; M.S. Zoology 20 years experience in environmental investigations and impact assessment.	Assistant Project Manager/Senior Project Scientist; data collection and key participant in description of proposed action, alternatives formulation, facilities, and land use alternatives and related environmental analysis.
Donald E. Beisel	B.S. Geography; M.A. Geography; 23 years of experience in community/urban planning, environmental planning, and socioeconomic studies.	Senior Project Planner; data collection and preparation of socioeconomic analysis and related text sections including EIFS model forecasts. Prepared transportation sections.
Elizabeth A. Crowell	B.A., Anthropology; M.A., American Civilization; M.A., Historical Archaeology; Ph.D., Historical Archaeology; more than 20 years experience in all phases of	Senior Archaeologist; data collection/preparation of the archaeological and cultural resources sections.

Name	Education and Experience	Primary Responsibilities
	prehistoric and historical archaeological projects.	
Daniel W. Currence	B.S., Civil Engineering; M.S., Environmental Engineering; 9 years of civil and environmental engineering experience on hazardous waste sites.	Senior Project Engineer; data collection/preparation of infrastructure and hazardous and toxic materials analysis and related sections.
Christine M. Eck	A.A.S., Commercial Art, 14 years of graphics, CADD, GIS and related experience.	CADD Specialist, graphics
Lee L. Gorday	B.A., Geology; M.A. Geology; 14 years of experience in hydrogeologic systems and groundwater contamination.	Senior Hydrogeologist; data collection and preparation of groundwater, geology, and soils elements.
Mike R. Grimm	B.S., Chemical Engineering; M.S., Chemical Engineering; 4 years experience in preparation of environmental documents, air emission inventories and permitting, regulatory compliance, and hazardous waste minimization.	Environmental Engineer; data collection and key participant in the preparation of air quality and climate analysis.
Randolph D. Norris	B.S., Plant & Soil Science; M.S. Environmental Planning; 6 years of experience in environmental planning, impact assessment, and environmental management.	Environmental Planner; data collection, preparation of quality of life and installation agreements analysis, and assisted in land use, noise, hazardous/toxic materials, and alternatives analysis.
G. Thomas Plattner	B.S., Biology; M.S., Environmental Studies; 8 years experience in wetland management; wildlife, and endangered species management; preparation of environmental documents.	Environmental Scientist; data collection, analysis and key participant in preparation of EIS text and supporting sections relating to biological resources, specializing in unique ecosystems and T&E species, including preparation of Appendix C.
Darrel B. Sisk, Jr.	B.E.D. Environmental Design; M.S. Architectural Engineering; 15 years experience in base civil engineering, military planning and environmental planning and impact assessment.	Senior Project Planner; data collection and key participant in description of proposed action and alternatives formulation, assisted in land use, noise, hazardous/toxic materials, infrastructure alternatives analysis and related environmental analysis.
Cynthia A. Whitley	B.A., International Affairs; M.A., Historical Archaeology; 10 years of experience in historic preservation, cultural resource management, and regulatory compliance.	Historian/Architectural Historian; data collection/preparation of cultural resources and archeological sections.

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SECTION 7: DISTRIBUTION LIST

Distribution List

7.1 INTRODUCTION

This Final Environmental Impact Statement (FEIS) will be filed with the U.S. Environmental Protection Agency and circulated for public review and comment. A Notice of Availability (NOA) will be printed in the *Federal Register*, initiating a 30-day comment period.

This Section identifies Federal, state and local agencies; and elected officials that received a copy of the DEIS. In addition, agencies, organizations, and individuals that provided substantive comments on the DEIS (or that specifically requested a copy of the FEIS) were provided with a copy of the FEIS concurrent with the publication of the Notice of Availability in the *Federal Register*. Those entities that received a copy of the FEIS have been indicated with an asterisk (*) in the list below. The FEIS (and appendices) have also been provided to each of the eight public repositories listed at the end of this Section and in subsection 1.3.4. All persons on the Environmental Impact Statement (EIS) mailing list will be informed (by receipt of a mailed informational flyer) of the availability of the FEIS; the location of numerous public repositories where the document is available for review; and the time, date and place where comments on the FEIS should be sent. Comments received during the FEIS 30-day comment period will be considered by the Army decision-maker in reaching the final decision on this action.

7.2 FEDERAL AGENCIES

Advisory Council on Historic Preservation (*)
Attn: Mr. Don L. Kilma, Executive Director
Old Post Office Building, Suite 809
100 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

Department of Health & Human Services
Attn: Ms. Pat Ford-Roegner
101 Marietta Tower, Suite 1515
Atlanta, Georgia 30323

Department of Housing and Urban Development (*)
Attn: Mr. Bill Dirl
600 Beacon Parkway, West, suite 300
Birmingham, Alabama 35209

Department of Housing and Urban Development
Attn: Mr. Heager L. Hill
600 Beacon Parkway, West, suite 300
Birmingham, Alabama 35209

Federal Highway Administration
Attn: Mr. Joe D. Wilkerson
500 East Boulevard, Suite 200
Montgomery, Alabama 36117

Federal Highway Administration (*)
Attn: Mr. Larry R. Dreihaup
Division Administrator
61 Forsyth Street SW 17T100
Atlanta, Georgia 30303

Federal Emergency Management Agency
Attn: Mr. Kenneth D. Hutchinson
Federal Regional Center
1371 Peachtree Street, N.E.
Atlanta, Georgia 30309

National Center for Domestic Preparedness (*)
Attn: Mr. L.Z. Johnson
Building 65
Fort McClellan, Alabama 36205-5000

USDA - Forest Service
Attn: Mr. John H. Yancey
2946 Chestnut Street
Montgomery, Alabama 36107

USDA - Natural Resources Conservation Service
Attn: Mr. John C. Meetze
665 Opelika Road (P.O. Box 311)
Auburn, Alabama 36830

U.S. Department of Interior (USDOI) (*)
Office of Environmental Policy and Compliance
Attn: Sheila Huff
1849 "C" Street, NW, Room 2340
Washington, D.C. 20240

USDOI - Bureau of Land Management
ATTN: Clay W. Moore
411 Briarwood Dr. Suite 404
Jackson, Mississippi 39206

USDOI - National Park Service
Attn: Director - Southeast Region
75 Spring Street
Atlanta, Georgia 30303

USDOI - U.S. Fish and Wildlife Service (*)
Attn: Mr. Larry E. Goldman
P.O. Drawer 1190
Daphne, Alabama 36256

USDOI - U.S. Fish and Wildlife Service (*)
Attn: Ms. Noreen K. Clough
Regional Director
1875 Century Boulevard
Atlanta, Georgia 30345

USDOI - U.S. Fish and Wildlife Service
Attn: Mr. Tom Follrath
Chief, Division of Real Estate
1875 Century Boulevard
Atlanta, Georgia 30345

USDOI - U.S. Geological Survey
Attn: Mr. Jess Weaver
2350 Fairlane Drive, Suite 120
Montgomery, Alabama 36116

US Department of Justice (*)
Attn: Ms Laurie Robinson
Office of Justice Programs
810 7th Street NW, Room 6400
Washington D.C. 20535

US Department of Justice
Attn: Mr John Hansel
Office of General Council
810 7th Street NW, Room 5400
Washington, D.C. 20535

US Environmental Protection Agency (*)
Region IV
Attn: Mr. Bart Reedy
100 Alabama Avenue
Atlanta Federal Center
Atlanta, Georgia 30303

US Environmental Protection Agency (*)
Region IV
Attn: Dr. Gerald Miller
345 Courtland Street, N.E.
Atlanta, Georgia 30365

7.3 STATE AGENCIES

Alabama Cooperative Extension System

Alabama Department of Conservation and Natural

Attn: Mr. W. Gaines Smith
State Headquaters, Office of the Director
Auburn University, Alabama 36849-5612

Resources (*)
Alabama Natural Heritage Program
Attn: Mr. Jarel Hilton
1500 E. Fairview Ave.
Montgomery, Alabama 36106

Alabama Department of Conservation and Natural Resources (*)
Game and Fish Division
Attn: Mr. Gary H. Moody
64 North Union Street
Montgomery, Alabama 36130

Alabama Department of Environmental Management (*)
Attn: Mr. Chris L. Johnson
1751 Cong. W.L. Dickinson Dr.
Montgomery, Alabama 36109-2608

Alabama Department of Forestry Management
Commissioner's Office
Attn: Mr. Jack Thompson
P.O. Box 3336
Montgomery, Alabama 36109-0036

Alabama Forestry Commission (*)
Attn: Mr. Timothy C. Boyce
513 Madison Avenue
Montgomery, Alabama 36104-3631

Alabama Historical Commission (*)
Attn: Elizabeth Brown
State Historic Preservation Officer
468 S. Perry Street
Montgomery, Alabama 36130-0900

Alabama Department of Transportation (*)
Attn: Mr. Bill Garnett
1409 Coliseum Boulevard
Montgomery, Alabama 36130-3050

Alabama Department of Transportation
Attn: Mr. Terry W. Robinson
1409 Coliseum Boulevard
Montgomery, Alabama 36130-3050

Alabama State Parks
Attn: Mr. Carlos A. Scardina
64 North Union Street
Montgomery, Alabama 36130

7.4 LOCAL AND REGIONAL AGENCIES

Anniston Housing Authority
Attn: Mr. Sam Jones, Jr.
P.O. Box 2225
Anniston, Alabama 36202

Anniston Museum of Natural History (*)
Attn: Cheryl H. Bragg
800 Museum Drive, P.O. Box 1587
Anniston, Alabama 36202-1587

East Alabama Regional Planning and Development Commission
Attn: Mr. David Shaw
1130 Quintard Ave., Suite 300
Anniston, Alabama 36202

Fort McClellan Development Commission (*)
Attn: Mr. Rob Richardson
Building 65
Fort McClellan, Alabama 36205-5000

7.5 ELECTED OFFICIALS

The Honorable Jefferson B. Sessions (*)
U.S. Senate
P.O. Box 228
Tuscumbia, Alabama 35674

The Honorable Fob James Jr. (*)
Govenor - State of Alabama
State Capitol
3926 Beardsley Drive
Montgomery , Alabama 36130

The Honorable Richard Shelby (*)
U.S. Senate
P.O. Box 1092
Tuscumbia, Alabama 35406

The Honorable Richard Shelby (*)
Attn: Patrick Denny
Federal Building (Senator Shelby's Office)
1118 Greensboro Ave.
Suite 240
Tuscaloosa, Alabama 35401

The Honorable Bob Riley (*)
U.S. House of Representatives
1129 Noble Street
Anniston, Alabama 36201

The Honorable Bob Riley (*)
Attn: Mr. Dan Gans
Office of Congressman Bob Riley
510 Cannon House Office Building
Washington D.C. 20515

The Honorable Doug Ghee
Alabama Senate
P.O. Box 848
Anniston, Alabama 36202

The Honorable Barbara Boyd (*)
Alabama House of Representatives (District 32)
P.O. Box 2132
Anniston, Alabama 36201

The Honorable Larry Simms
Alabama House of Representatives
11 South Union Street
Eastaboga, Alabama 36260

The Honorable Mike Rogers
Alabama House of Representatives
State Capitol Building
Montgomery, Alabama 36130

The Honorable Gene Stedham
Mayor of Anniston
P.O. Box 670
Anniston, Alabama 36202

The Honorable Joe Mundy
Mayor of Blue Mountain
Blue Mountain City Hall
Blue Mountain, Alabama 36201

The Honorable Wille Maude Snow
Mayor of Hobson City
600 Park Avenue
Hobson City, Alabama 36201

The Honorable George Douthit
Mayor of Jacksonville
320 Church Avenue, S.E.
Jacksonville, Alabama 36265

The Honorable Joseph Roberson
Mayor of Ohatchee
301 Main Street
Ohatchee, Alabama 36271

The Honorable Leon Smith
Mayor of Oxford
P.O. Box 3383
Oxford, Alabama 36203

The Honorable Vera Stewart
Mayor of Piedmont
P.O. Box 112
Piedmont, Alabama 36272

The Honorable Ed Kimbrough
Mayor of Weaver
406 Anniston Street
Weaver, Alabama 36277

Calhoun County Commission
Calhoun County Administrative Offices
1702 Noble Street, Suite 103
Anniston, Alabama 36201

7.6 ORGANIZATIONS

Alabama Environmental Council (*)
Attn: Mr. Kenneth Wills
2717 7th Ave. South, Suite 207
Birmingham, Alabama 35233

Alabama Audubon Council & Alabama (*)
Ornithological Society
Attn: Robert R. Reid, Jr.
2616 Mountain Brook Parkway
Birmingham, Alabama 35223

Anniston Chamber of Commerce
Attn: Mr. Gerald Powell - Military Affairs Com.
P.O. Box 909
Jacksonville, Alabama 36265

Auburn University, School of Forestry (*)
Attn: Dr. John S. Kush
108 M. White Smith Hall
Auburn University, Alabama 36849-5418

Auburn University, Department of Zoology and Wildlife Science
Attn: Dr. Geoffrey Hill
331 Funchess Hall
Auburn University, Alabama 36849-5414

B.A.S.S.
Attn: Mr. Bruce Shupp
P.O. Box 17900
Montgomery, Alabama 36141-0900

Bluebirds Over Alabama (*)
Attn: Ms. Laura Meeds
26 Pelham Hgts
Anniston, Alabama 36206

Building Trades, Plumbers, and Steamfitters
Attn: Mr. Ben Hollingsworth
P.O. Box 29
Weaver, Alabama 36277

Calhoun Veterans Council
Attn: Mr. R.J. Hewitt
6206 Meadowlark Dr.
Anniston, Alabama 36206

Heartwood
Attn: Mr. Thomas J. Sager
8 Laird Ave.
Rolla, Missouri 65401

The Longleaf Alliance (*)
Attn: Mr. Dean Gjerstad

The Nature Conservancy of Alabama
Attn: Ms. Kathy Cooley

111 M. White Smith Hall
Auburn University, Alabama 36849-5418

Jacksonville State University (*)
Attn: Mr. Pete Conroy
Ayers Hall
Jacksonville, Alabama 36205

Wild Alabama (*)
Attn: Mr. Robert Cox
P.O. Box 117
Moulton, Alabama 35650

Pepper Place 2821C 2nd Avenue South
Birmingham, Alabama 35233

Sierra Club
Attn: Mr. Troy Gordon
P.O. Box 58
Columbia, MO 65205

7.7 INDIVIDUALS

Mr. Peter Allan
25 Hickory Place
APT. H-22
Chatham, NJ 07928-3014

Ms. Janet Brittain
103 E. 22nd Street
Anniston, Alabama 36201

Mr. Curtis Franklin
802 Wana Street
Weaver, Alabama 36277

Mr. John Hendry
EDAW, Inc.
200 Sparkman Drive
Huntsville, AL 35805

Mr. George Horn (*)
61 Jewell Lane
Oxford, Alabama 36203

Mr. Joe Johnson
1670 Clara Lane
Weaver, Alabama 36277

Richard L. Krause
1506 Forest Avenue
Wilmette, Illinois 60091

Mr. Andrew Mavian
1819 H. Street NW., Suite 900
Washington, D.C. 20006

Mr Norman Morrison
126 Mattison

Mr. Jeff Amy (*)
Anniston Star
P.O. Box 189
Anniston, Alabama 36202

Mr. Harry A. Bryson
P.O. Box 1056
APO, AP 96555

Mr. Bill Garland
31600 Tara
Spanish Fort, Alabama 36527

Mr. John R. Herbert
QST Environmental, Inc.
404 SW 140th Terrace
Newberry, Florida 32669-3000

Ms. Francine Hutchinson
105 Shamrock Road
Anniston, Alabama 3620

Mr. Nick Kilgore
1114 Anniston Road
Anniston, AL 36206-7729

Mr. Lewis Lankford, E-6, Ret. US Army (*)
1105 Bonnie Drive
Weaver, Alabama 36277

Mr. Calvin H. McDowell
1144 Anniston Beach Road
Anniston, AL 36206

Mr. Jim Noles
Balch & Bingham

Oxford, Al 36203

P.O. Box 306
Birmingham, AL 35201

Ms. Lisa A. Orlando
BSA Environmental Services, Inc.
21403 Chagrin Blvd., Suite 101
Beachwood, OH 44122

David Pace
API
2021 K Street, NW
Washington, D.C. 20006

Mr. Earl Possardt
USDOI - U.S. Fish and Wildlife Service
1875 Century Boulevard
Atlanta, Georgia 30345

Russ Romme
3D International, Inc.
781 Neeb Road
Cincinnati, Ohio 45233

Ms. Judy Smith (*)
Monograph Acquisition Services
Colorado State University Libraries
Fort Collins, Colorado 80523-1019

Mr. Daniel E. Spector (*)
1317 7th Avenue, Northeast
Jacksonville, Alabama 36205

Mr. Harry Thomas
5708 Dawson Avenue
Anniston, Alabama 36206

Mr. Tommy Thompson
3530 Highway 78 West
Oxford, Alabama 36203

Mr. Donald L. Walters (*)
115 Jill Lane
Anniston, Alabama 36201

Dr. D. R. Webb
200 Park Ave.
Eugene, Oregon 97405

7.8 PUBLIC LIBRARIES

A copy of the FEIS (including the main document and appendices) is available for public review at the following public libraries:

Fischer Library
U.S. Army Chemical School
Fifth Avenue, Building 1081
Fort McClellan, Alabama 36205-5020

Contact: Mr. Richard Pastorett (205) 848-4414

Ramsey Library
U.S. Army Military Police School
Building 3181
Fort McClellan, Alabama 36205-5020

Contact: Ms. Carolyn Floyd (205) 848-3737

Abrams (Fort McClellan Community) Library
2102 Traffic Circle
Fort McClellan, Alabama 36205-5020

Contact: Ms. Joyce Waybright (205) 848-4151

Anniston - Calhoun County Public Library
108 E. 10th Street
Anniston, Alabama 36202

Contact: Mr. Tom Mullins (205) 237-8503
(Special Collections - Alabama Room)

Oxford Public Library
213 Choccolocco Street
Oxford, Alabama 36203

Contact: Ms. Irene Sparks (205) 831-1750

Jacksonville Public Library
200 Pelham Road, North
Jacksonville, Alabama 36205

Contact: Ms. Kathryn Childress (205) 435-6332

Cole Library
Jacksonville State University
700 Pelham Road, North
Jacksonville, Alabama 36265-1602

Contact: Ms. Mary Beris (205) 782-5758

Mobile District, Army Corps of Engineers
109 Saint Joseph Street
P.O. Box 2288
Mobile, Alabama 36628

Contact: Mr. Curtis Flakes (334) 690-2777

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Persons Consulted

Name	Address	Telephone No.	Reason Contacted
Allison, James	Botanist Georgia Natural Heritage Prog. Social Circle, Georgia	770-918-6411	Biological Resources MLP Forest Complex
Aspy, Dale	USEPA Region IV Mobile Source Group 345 Courtland Street N.E. Atlanta, Georgia 30365	404-562-9041	Air Quality Analysis
Boyer, William	Research Forester U.S. Forest Service Southern Research Station Auburn University, Alabama	334-826-8700	Biological Resources MLP Forest Complex
Costa, Ralph	Red-cockaded Woodpecker Recovery Biologist U.S. Fish and Wildlife Service Clemson, South Carolina	864-656-2432	Biological Resources MLP Forest Complex
Currie, Robert	Listing/Recovery Biologist U.S. Fish and Wildlife Service Ashville, North Carolina	704-258-3939 ext. 224	Biological Resources MLP Forest Complex
Curtis, Bill	East Alabama Regional Planning and Development Commission 1130 Quintard Avenue Anniston, Alabama 36202	205-237-6741	Land Use, Socioeconomics, Transportation
Fulks, Rebecca	Alabama Department of Transportation 1409 Coliseum Blvd. Montgomery, Alabama 36130	334-242-6649	Air Quality Analysis
Garland, Bill	Fish and Wildlife Biologist	334-441-5181	Biological Resources

Name	Address	Telephone No.	Reason Contacted
	U.S. Fish and Wildlife Service Daphne, Alabama		MLP Forest Complex
Garner, Aaron	Building Department City of Oxford 100 Choccolocco Street Oxford, Alabama	205-831-9685	Building Permit Data, Construction Cost Estimates
Garnett, Bill	Alabama Department of Transportation 1409 Coliseum Blvd. Montgomery, Alabama 36130	334.242.6152	Southern Bypass Highway
Garrett, Dale	Building Department City of Anniston Anniston, Alabama	205-231-7660	Building Permit Data, Construction Cost Estimates
Garthright, Lynn	Alabama Department of Environmental Management PO Box 361463 Montgomery, Alabama 36130	334-271-7878	Air Quality Analysis
Goldman, Larry	Field Supervisor U.S. Fish and Wildlife Service Daphne, Alabama	334-441-5181	Biological Resources MLP Forest Complex
Hainds, Mark	Coordinator Longleaf Pine Alliance Andalusia, Alabama	334-222-7779	Biological Resources MLP Forest Complex
Hansen, Craig	Calhoun County Health Department Anniston, Alabama	205-237-4324	Septic Tank Hookups
Haynes, Steve	Alabama Transportation Department 1545 US Highway 431 Anniston, Alabama	205-8203131	Transportation, Traffic
Hill, Geoff	Assistant Professor Dept. of Zoology/Wildlife Science Auburn University, Alabama.	334-844-9269	Biological Resources MLP Forest Complex
Hilton, Jarel	Acting Coordinator Alabama Natural Heritage Prog. Montgomery, Alabama	334-834-4519	Biological Resources MLP Forest Complex
Hunter, Chuck	Partners in Flight Coordinator U.S. Fish and Wildlife Service	404-679-7130	Biological Resources MLP Forest Complex
Jacobson, Terry	T&E Recovery U.S. Fish and Wildlife Service Jackson, Mississippi	601-965-4900	Biological Resources MLP Forest Complex
Jaye, Nolan	Environmental Engineer Bregman & Company Director of Engineering Anniston, Alabama	205-848-3120	Solid Wastes

Name	Address	Telephone No.	Reason Contacted
Johnson, Charles	Public Works Department City of Anniston 1128 Gurnee Avenue Anniston, Alabama	205-231-7742	Land Use Plans
Johnson, Chris	Alabama Dept. of Environmental Management 1751 Cong. W.L. Dickenson Dr. Montgomery, Alabama 36130	334.271.7789	ADEM regulations
Kush, John S.	Senior Research Associate School of Forestry Auburn University, Alabama	334-844-1065	Biological Resources MLP Forest Complex
Maceina, Edelgard	Graduate student School of Forestry Auburn University, Alabama	334-844-1005	Biological Resources MLP Forest Complex
Mauer, Eric	USEPA Region IV Mobile Source Group 345 Courtland Street N.E. Atlanta, Georgia 30365	404-562-9041	Air Quality Analysis
Meldahl, Ralph	Assistant Professor School of Forestry Auburn University, Alabama.	334-844-1060	Biological Resources MLP Forest Complex
Oberholster, Chris	Director of Science/Stewardship Nature Conservancy Birmingham, Alabama	205-251-1155	Biological Resources MLP Forest Complex
Oberholster, Susan	Botanist U.S. Forest Service Brent, Alabama	205-926-9765	Biological Resources MLP Forest Complex
Patterson, Karen	Ecoregional Ecologist Nature Conservancy Chapel Hill, North Carolina	919-967-5439	Biological Resources MLP Forest Complex
Reiss, John	Petroleum Engineer Oil & Gas Section Jackson (MS) District Bureau of Land Management	601-977-5400	Geology
Richardson, Robert	FMDC (FMRRA) 1702 Noble Street, Suite 101 Anniston, Alabama 36202	205-231-1724	Reuse Planning
Schafale, Mike	Ecologist/Botanist North Carolina Heritage Prog.	919-733-4181	Biological Resources MLP Forest Complex
Schotz, Alfred	Community Ecologist Alabama Natural Heritage Prog. Montgomery, Alabama	334-242-3044	Biological Resources MLP Forest Complex
Shankman, David	Professor Department of Geography University of Alabama Tuscaloosa, Alabama	205-348-1534	Biological Resources MLP Forest Complex

Name	Address	Telephone No.	Reason Contacted
Shaw, David	East Alabama Regional Planning and Development Commission 1130 Quintard Avenue, Suite 1130 Anniston, Alabama 36202	205-237-6741	Socioeconomics
Summerour, Charles	retired Professor/Ornithologist Jacksonville State University, Alabama	205-435-4730	Biological Resources MLP Forest Complex
Wills, Kenneth	Natural Resource Planner/Biologist Alabama Environmental Council Birmingham, Alabama	205-322-3126	Biological Resources MLP Forest Complex
Woodrey, Mark	Wildlife/Fisheries Biologist Natural Science Museum Jackson, Mississippi	601-354-7303	Biological Resources MLP Forest Complex
Webb, Randy	Ornithologist Net Work Associates Eugene, Oregon	541-683-7576	Biological Resources MLP Forest Complex
Wood, Ken	Building/Public Works Department City of Jacksonville Jacksonville, Alabama	205-435-7611	Building Permit Data

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APPENDIX C: MOUNTAIN LONGLEAF PINE FOREST ECOSYSTEM

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Mountain Longleaf Pine Forest Ecosystem

C.1 MOUNTAIN LONGLEAF PINE FOREST ECOSYSTEM

C.1.1 Introduction/Ecological Concepts

The Mountain Longleaf Pine (MLP) communities and the 12,000-acre (4,850-hectare) forest ecosystem at Fort McClellan (FMC) are considered valuable natural resources. This appendix is designed to provide an overview of these resources and explain their importance.

The forest block at FMC is ecologically important due to its large size and unfragmented condition, diversity and uniqueness of species and communities present, rare species of animals and plants present, and general lack of exotics and disturbance. Decreased logging frequencies and periodic range fires that have allowed the plant communities to be maintained under "natural" conditions add to the ecological importance of this ecosystem. Ecological values of large forest blocks, which includes the MLP ecosystem, include erosion control, creation of microhabitats, soil formation, groundwater recharge, floodflow alteration, nutrient cycling, food chain support, pollutant detoxification, and conservation of genetic diversity (USEPA, 1990; and USEPA, 1993).

The flora and fauna at FMC is diverse. Diversity at FMC is a result of topography that ranges from 700 to 1360 feet (214 to 415 meters) National Geodectic Vertical Datum (NGVD), moisture conditions that range from xeric to mesic to hydric, different fire regimes, and variances in slope and slope face. The variations in the physical environment create conditions favorable for the variety of plant communities that in turn support the diverse faunal populations. Habitats at FMC include various types of upland forest, bottomland forest, savannas, seeps, lakes, old fields, and thickets. Flora includes more than 200 known species of plants in at least 60 families. Major groups of plants include asters, legumes, ferns, sedges, grasses, oaks, hickories, roses, pines, rushes, and violets. Fauna includes many species of mammals, birds, reptiles, amphibians, fish, and invertebrates. There are approximately 40 species of mammals that include various species of bats, shrews, squirrels, rabbits, and mice. Common game species include white-tailed deer and wild turkey. Over 200 species of birds have been observed at FMC that include many species of waterfowl, shorebirds, hawks, owls, woodpeckers, warblers, sparrows, tanagers, vireos, wrens, and grosbeaks. Reptiles and amphibians include various species of snakes, salamanders, frogs, and turtles. Fish include various species of sunfish, shiners, darters, catfish, and bass. More than 10 taxa of invertebrates have been noted at FMC.

The Alabama Natural Heritage Program identified eight general terrestrial community types that occur on the Main Post. Those types are typic mesophytic forest, Piedmont monadnock forest, interior calcareous oak-hickory forest, basic oak-hickory forest, loblolly pine-shortleaf pine-oak forest, xeric Virginia pine ridge forest, dry Virginia pine-oak forest, and MLP forest (see Table C.1). Reproduction, pole, sawtimber, and over-mature (old growth) successional stages are present within the majority of the forest types present at FMC. The various forest types and successional stages creates a mosaic of habitat and community types.

Table C.1 Typical Plant Species in Fort McClellan Upland Forest Communities

	Typic Meso-phytic	Piedmont Monadnock	Interior Calcareous Oak-Hickory	Basic Oak-Hickory	Loblolly & Shortleaf Pine - Oak	Xeric Virginia Pine Ridge	Dry Virginia Pine-Oak	Mountain Longleaf Pine
CANOPY SPECIES								
shagbark hickory *Carya alba*								·
mokernut hickory *C. tomentosa*		·						
yellow poplar *Liriodendron tulipifera*	·							
sweetgum *Liquidambar styraciflua*	·							
black gum *Nyssa sylvatica*	·							·
shortleaf pine *Pinus echinata*	·				·			·
longleaf pine *P. palustris*					·			·
loblolly pine *P. taeda*	·				·			·
Virginia pine *P. virginiana*				·			·	
white oak *Quercus alba*	·	·		·				
scarlet oak *Q. coccinea*		·						
southern red oak *Q. falcata*							·	·
blackjack oak *Q. marilandica*							·	
chinkapin oak *Q. muehlenbergii*				·				
water oak								

Table C.1 Typical Plant Species in Fort McClellan Upland Forest Communities

	Typic Meso-phytic	Piedmont Monadnock	Interior Calcareous Oak-Hickory	Basic Oak-Hickory	Loblolly & Shortleaf Pine - Oak	Xeric Virginia Pine Ridge	Dry Virginia Pine-Oak	Mountain Longleaf Pine
Q. nigra				.				
willow oak *Q. phellos*			.					
chestnut oak *Q. prinus*		.	.				.	.
northern red oak *Q. rubra*	.							
post oak *Q. stellata*				.			.	.
black oak *Q. velutina*				.				
oak *Q. spp.*	.				.			
UNDERSTORY SPECIES								
chalk maple *Acer leucoderme*				.				
box elder *A. negundo*			.					
red maple *A. rubrum*	.	.						
sugar maple *A. saccharum*			.					
ironwood *Carpinus caroliniana*			.					
redbud *Cercis canadensis*			.	.				
flowering dogwood *Cornus florida*	.	.						
American beech *Fagus grandifolia*			.					
witch hazel *Hamamelis virginia*	.							
common juniper *Juniperus communis*								
eastern red cedar *J. virginiana*			.					
sweetgum								

Table C.1 Typical Plant Species in Fort McClellan Upland Forest Communities

	Typic Meso-phytic	Piedmont Monadnock	Interior Calcareous Oak-Hickory	Basic Oak-Hickory	Loblolly & Shortleaf Pine - Oak	Xeric Virginia Pine Ridge	Dry Virginia Pine-Oak	Mountain Longleaf Pine
Liquidambar styraciflua	.							
blackgum *Nyssa sylvatica*		.						
hophornbeam *Ostrya virginiana*			.					
sourwood *Oxydendrum arboreum*	.	.						.
turkey oak *Quercus laevis*								.
blackjack oak *Q. marilandica*								.
Carolina buckthorn *Rhamnus caroliniana*			.					
SHRUB SPECIES								
chokeberry *Aronia arbutifolia*						.		
mountain laurel *Kalmia latifolia*	.							
Piedmont azalea *Rhododendron canescens*								.
coralberry *Symphoricarpos orbicuatus*				.				
tree sparkleberry *Vaccinium arboreum*						.	.	
southern low blueberry *V. pallidum*	.	.						.
deerberry *V. stamineum*								.
southern wild-raisin *Viburnum nudum*	.							
V. spp.				.				
yellowroot *Xanthorhiza*	.							

Table C.1 Typical Plant Species in Fort McClellan Upland Forest Communities

	Typic Meso-phytic	Piedmont Monadnock	Interior Calcareous Oak-Hickory	Basic Oak-Hickory	Loblolly & Shortleaf Pine - Oak	Xeric Virginia Pine Ridge	Dry Virginia Pine-Oak	Mountain Longleaf Pine
simplicissima								
VINE SPECIES								
false jessamine *Gelsemium sempervirens*							.	
muscadine grape *Vitis rotundifolia*	.							
HERBACEOUS SPECIES								
foxglove *Aureolaria pectinata*								.
bracken fern *Pteridium aquilinium*								.
little bluestem *Schizachyrium scoparium*							.	
narrow-leaved sensitive brier *Schrankia microphylla*								.
black oat grass *Stipa avenacea*							.	
pencil flower *Stylosanthes biflora*								.
goat's rue *Tephrosia virginiana*								.
poison oak *Toxicodendron toxicarium*								.

SOURCE: FWEC, 1996

The relative large size, undisturbed, and unfragmented condition, of the forest ecosystem; taxonomic, community, and successional diversity present; and periodic wildfire create the ecological matrix in which the MLP communities and rare species exist. A "naturally" or ecologically maintained MLP ecosystem of this quality is only known to occur at FMC.

C.1.2 Historic Development and Decline of Longleaf Pine Forests

Longleaf pine forests redeveloped after the retreat of the last continental ice sheet (approximately 10,000 years before present) and these "core" forests remained in place for approximately 5,000 years. Fire has always been an important component of the longleaf pine forests, with lightning strikes likely accounting for the majority of the fires in the region from 5,000 to 2,500 years before present. Palynological investigations indicate that about 2,500 years ago pine and corn pollen began to simultaneously increase in central Alabama. This provides evidence that Indian (aborigines) agriculture and related fires may have had a significant impact on forest composition. Native Americans practiced slash and burn agriculture. Fire used to clear fields of weeds and other vegetation probably escaped into the surrounding forests. Indians may also have used fire to drive game, enhance game habitat, and reduce forest undergrowth to make traveling easier. It is likely that these aboriginal fires favored the expansion of longleaf pine forests, particularly on ridgetops and south/west facing slopes (Landers, 1995; and Shankman, 1995).

Historically, the longleaf pine was once the dominant upland plant cover of the southeastern U.S., formerly extending from what is now southeastern Virginia to central Florida and eastern Texas. These longleaf pine forests, when encountered by the early Europeans, totaled 60 to 90 million acres (24 to 36 million hectares). Currently the longleaf pine ecosystem is considered critically endangered. At least 1,200 plant species are endemic to this ecosystem (Landers, 1995; and NBS, 1995).

Within the last 400 years the extensive longleaf pine forest acreage decreased to approximately three million acres (1.2 million hectares). The decrease in the longleaf pine ecosystem was due to extensive logging; conversion to cropland, pasture, and urban areas; suppression of fire; and preferred use of other pine species on forest plantations. Due to these various factors FMC represents the last known remaining landscape example of naturally regenerated and fire maintained Mountain Longleaf Pine (MLP) communities. The Shoal Creek District (Talladega Mountain) and the Talladega District (Cheaha Mountain) of the Talladega National Forest have significant stands of longleaf pine that occur in mountain areas. The Talladega National Forest stands have had some combination of artificial regeneration, historic fire suppression, and/or use of herbicides to control hardwood competition that have altered their floral composition and uniqueness (Landers, 1995; Hilton, 1996; and Maceina, 1996).

C.1.3 Longleaf Pine Species Characteristics

The longleaf pine has long needles (8-18 inches/20-46 centimeters) and cones (6-10 inches/15-25 centimeters), stout twigs (0.5+ inch/1.3+ centimeters), and white buds. Mature trees generally reach a height of 60-70 feet (18-21 meters) and a trunk diameter of 1-2 feet (0.3-0.6 meters). Longleaf pine grows in warm, wet temperate climates characterized by hot summers and mild winters. The seeds from this species require contact with mineral soil for satisfactory germination and establishment. Longleaf seedlings go through a "grass" stage for the first few years, during which an extensive root system develops. This species grows moderately fast and straight, has high quality wood, and self prunes. The longleaf pine is intolerant of competition from other plants for light, moisture, and/or nutrients. Brown-spot needle blight (*Scirrhia acicola*) is the most common disease affecting this pine. The longleaf pine is generally more resistant to fire, pathogens, insects, and damage from ice and wind storms than other southern pines; and has the potential to reach an age of 500 years. Stands greater than 200 years of age are rare (Boyer, 1991; Petrides, 1988; and Landers, 1995).

Longleaf pine that occurs in mountain regions of Alabama and Georgia is a distinct ecotype, exhibiting phenological and morphological differences. This gene pool is a valuable resource for silvicultural improvement efforts. MLP is less resistant to brown spot, grows into shorter and larger diameter trees, and has better seed production than the coastal ecotypes. Outplanting studies indicated that MLP taken from rich mountain coves demonstrated superior growth rates to longleaf pine taken from southern Mississippi (Maceina, 1996).

C.1.4 Mountain Longleaf Pine Community Characteristics

Most of the longleaf pine forests occur within the Coastal Plains of the southeastern U.S. at elevations below 660 feet. Soils in the Coastal Plains are typically deep and sandy. Longleaf pine forests also occur within a peninsula that extends through the Piedmont Ridge and Valley and into the Mountain Provinces of Alabama and northwest Georgia at elevations from 660 feet to 1,970 feet. The soils within the mountains of northeast Alabama are often shallow and rocky (Boyer, 1990; and FMC, 1996e).

The structure and composition of MLP forests significantly differ from those found on the Coastal Plain. Slope, aspect, and elevation appear to be significant factors influencing fire intensity and the distribution of longleaf pine in these mountain regions. The forests are composed of a variety of species, with longleaf pine dominating on flat, xeric ridges and moderately steep to steep (30-70 percent) upper, generally south to southwest facing, slopes. This MLP community occurs on a variety of rock types including quartzites, phyllites, and mica schists (NatCons, 1995).

These MLP forests contain a highly diverse assemblage of species and biological communities. This high species diversity can be attributed to both geographical and physiographic factors. The Ridge and Valley Physiographic Province and a southern disjunct of the Blue Ridge Physiographic Province introduce a decidedly Appalachian influence into the region. A large number of species reach the southern terminus of their range on these lands. At the same time, the region is also influenced by proximity to the Piedmont and Coastal Plain. The widespread existence of longleaf pine and, in particular, a northern disjunct population of turkey oak are particularly significant (Hilton, 1996; and FMC, 1996e).

While the longleaf pine (*Pinus palustris*) is the dominant overstory plant, there are other significant species associated with this community. Tree species present at FMC that are typical of the MLP ecosystem are included in Table C.2. Many of these tree species occur at the limit of their ranges. Longleaf pine, loblolly pine, and turkey oak are at their northern limit. Virginia pine, chestnut oak, and scarlet oak are at their southern limit. Shrubs at FMC that are typically found in the MLP ecosystem are included in Table C.3. Herbaceous species at FMC that are typically found in the MLP ecosystem are included in Table C.4.

Table C.2 Tree Species Associated with the MLP Ecosystem

Common Name	Scientific Name
longleaf pine	*Pinus palustris*
shortleaf pine	*Pinus echinata*
Virginia pine	*Pinus virginiana*
post oak	*Quercus stellata*
chestnut oak	*Quercus prinus*
blackjack oak	*Quercus marilandica*
scarlet oak	*Quercus coccinea*
southern red oak	*Quercus falcata*
turkey oak	*Quercus laevis*
black oak	*Quercus velutina*
mockernut hickory	*Carya tomentosa*
pignut hickory	*Carya alba*
blackgum	*Nyssa sylvatica*
black cherry	*Prunus serotina*
persimmon	*Diospyros virginiana*

sourwood	*Oxydendrum arboreum*

Source: Mohr, 1901; Harper, 1949; Boyer, 1990; Maceina, 1996; NatCons, 1995; Peet, 1994; and ANHP, 1994

Table C.3 Shrub Species Associated with the MLP Ecosystem

Common Name	Scientific name
southern blueberry	*Vaccinium tenellum*
mountain blueberry	*Vaccinium pallidum*
tree sparkleberry	*Vaccinium stamineum*
farkleberry	*Vaccinium arboreum*
huckleberry	*Gaylussacia dumosa*
prickly dewberry	*Rubus flagellaris*
winged sumac	*Rhus copallina*
false jessamine	*Gelsemium sempervirens*
poison oak	*Toxicodendron toxicarium*
Piedmont azalea	*Rhododendron canescens*

Source: Mohr, 1901; Harper, 1949; Boyer, 1990; Maceina, 1996; NatCons, 1995; Peet, 1994; and ANHP, 1994

Table C.4 Herbaceous Species Associated with MLP Ecosystem

Common Name	Scientific Name
broomsedge	*Andropogon virginicus*
little bluestem	*Schizachyrium scoparium*
northern oat grass	*Danthonia spicata*
Indian grass	*Sorghastrum nutans*
silky wild oatgrass	*Danthonia sericea*
bushy aster	*Aster dumosus*
calico aster	*Aster lateriflorus*
late purple aster	*Aster patens*
golden aster	*Pityopsis graminifolia*
stiff leaved aster	*Ionactis linariifolius*
Maryland golden aster	*Chrysopsis mariana*
rosinweed	*Silphium compositum*
sundrops	*Oenothera fruticosa*
St. Johnswort	*Hypericum hypericoides*
wild quinine	*Parthenium integrifolium*
bracken fern	*Pteridium aquilinum*

greater tickseed	*Coreopsis major*
goat's-rue	*Tephrosia virginiana*
birdfoot violet	*Viola pedata*
Georgia calamint	*Calamintha georgina*
pencil flower	*Styosanthes biflora*
foxglove	*Aureolaria pectinata*
flowering spurge	*Euphorbia corollata*
narrow-leaved sensitive brier	*Schrankia microphylla*
sweet goldenrod	*Solidago odora*
creeping bush clover	*Lespedza repens*

Source: Mohr, 1901; Harper, 1949; Boyer, 1990; Maceina, 1996; NatCons, 1995; Peet, 1994; and ANHP, 1994

Based on floral composition and topographic features, the MLP forest is considered part of a distinct natural community within the longleaf pine ecosystem. This natural ecosystem once covered ridge and southern slope regions of the Blue Ridge in northeastern Alabama and northwestern Georgia, but has been reduced to several degraded sites in northeastern Alabama. The main post of FMC represents the best remaining example of the MLP ecosytem on a landscape scale (Hilton, 1996).

C.1.5 Characteristics of the Mountain Longleaf Pine Ecosystem at FMC

The 12,000-acre MLP ecosystem at FMC is a mosaic of forest types (See Figure C.1). The MLP ecosystem is primarily present in the pine/hardwood and hardwood/pine areas. Figure C-2, Sensitive Habitats, provides additional graphic infromation on MLP. On ridgetops where wildfires have been infrequent, stunted oak may be the dominant forest cover. Longleaf pine communities dominate on xeric ridgetops and south/west facing slopes where wildfires have frequently occurred. As fire frequency decreases, shortleaf pine and hardwoods express more dominance. Mesic ravines and lower north/east facing slopes are dominated primarily by hardwoods with some loblolly pine present. Between the longleaf pine dominated slopes and the mesic ravines are complex ecotones/transition zones that contain components of both the xeric and mesic species. The typical mesic hardwoods that are associated with the Mountain Longleaf forest and seep borders that are present at FMC are listed in Table C.5. This mixture of pine, pine/hardwood, hardwood/pine, and hardwood components adds diversity to the forest ecosystem. This diversity and abundance of "internal edge" provides for numerous microhabitats and helps to account for the many species of birds, reptiles, and mammals present at FMC.

Table C.5 MLP Associated Species in Mesic Ravines

Common Name	Scientific Name
loblolly pine	*Pinus taeda*
tulip popular	*Liriodendron tulipifera*
red maple	*Acer rubrum*
sweetgum	*Liquidambar styraciflua*
white oak	*Quercus alba*
northern red oak	*Quercus rubra*
water oak	*Quercus nigra*

beech	*Fagus grandifolia*
flowering dogwood	*Cornus florida*
mountain laurel	*Kalmia latifolia*
muscadine grape	*Vitis rotundifolia*
sassafras	*Sassafras albidum*

Source: Mohr, 1901; Harper, 1949; Boyer, 1990; Maceina, 1996; NatCons, 1995; Peet, 1994; and ANHP, 1994

The FMC MLP ecosystem is mostly unfragmented, includes federal and state ranked species, Special Interest Natural Areas (SINA), is valuable habitat for neotropical migratory birds (NTMB), contains some high quality old growth MLP communities, and is relatively free of exotic species. Approximately 12,000 (4,850 hectares) of the 19,000 acres (7,689 hectares) within FMC are considered to be part of this ecosystem. Plants designated as state "Species of Conservation Concern" (SCC) within the MLP ecosystem at FMC are listed in Table C.6 and Animal SCC are listed in Table C.7. Additional information on SCC that also have a federal designation can be found in subsections 4.11.4 and 4.11.5.2. These rare flora occur in a diverse habitat matrix embedded within the overall forest cover on the Main Post. Long term viability of these species is dependent upon the integrity of the forest (FMC, 1996d; FMC, 1996e; and Hilton, 1996).

Figure C.1 Forest Cover Types and Soil Map Units
(11 X 17 Color)

Table C.6 Plant Species of Conservation Concern

Common Name	Scientific Name	State Rank
sky blue aster	*Aster azureus*	S1
three-flowered hawthorn*	*Crataegus triflora*	S2
pink lady's slipper	*Cypripedium acaule*	S3
pale coneflower	*Echinacea pallida*	S2
eastern purple coneflower	*Echinacea purpurea*	S2
soapwort gentian	*Gentiana saponaria*	S3
ground juniper	*Juniperus communis*	S1
yellow honeysuckle	*Lonicera flava*	S3
Fraser's loosestrife*	*Lysimachia fraseri*	S1
single flowered cancer root	*Orbanche uniflora*	S2
white fringeless orchid*	*Platanthera integrilabia*	S1
rose pink	*Sabatia capitata*	S2
crow-poison	*Zigadenus leimanthoides*	S1

Note: * Denotes Federally designated species of concern, see Table 4.24

Source: Hilton, 1996; and FMC, 1996d

Table C.7 Animal Species of Conservation Concern [1]

Common Name	Scientific Name	State Rank
Appalachian cottontail	*Sylvilagus obscurus*	S1
gray bat[1]	*Myotis grisescens*	S2
Carlson's Polycentropus caddisfly [2]	*Polycentropus carlsoni*	S1
coldwater elimia	*Elimia gerhardti*	S [4]
red-cockaded woodpecker [3]	*Picoides borealis*	S2
northern pine snake	*Pituophis melanoleucus*	S3
Diana butterfly	*Speyeria diana*	S [4]

Notes:
1 See Tables 4.23 and 4.24 for the federal status of these species.
2 There are 16 other species of caddisflies considered rare or uncommon, i.e., have a state rank from S1 to S3.
3 There are no active clusters of red-cockaded woodpecker located within the MLP ecosystem at FMC, but the habitat may be suitable for this species which has active colonies approximately 5 to 7 miles to the east in the Talladega National Forest.
4 State ranking is currently under evaluation.

Source: FMC, 1996d; Hilton, 1996; and 3D/E, 1996

There is a good correlation with soil map units classified as "Stony Rough Land" (map units "Ss" and "St") and the occurrence of unfragmented forest areas at FMC that contain MLP communities. This land is not suitable for agriculture or commercial forestry. Due to low economic value and inaccessibility this land experienced less historic logging and development than surrounding lands. Stony Rough Land has shallow soil with many rock fragments, rock outcrops, and escarpments composed of sandstone and

slate; has poor tilth, low natural fertility, high runoff, slow infiltration, low water holding capacity, and slopes are generally greater than 25%; has a silt loam to silty clay loam texture, low amounts of organic matter, is very strongly acid, and has a high erosion hazard (FMC, 1996d; and USDA, 1961).

Soil map units Anniston and Allen Stony Loams (AdC and AdE), and Jefferson Stony Fine Sandy Loam (JfB) are currently covered largely by unfragmented forest. Due to the better soil properties and accessibility, these soils have historically experienced more frequent logging and other types of disturbance than areas with Stony Rough Land experienced. Anniston and Allen Stony Loams have deep soil, with many rock fragments up to eight inches; have fair to poor tilth; are well drained, have moderate permeability, high water holding capacity, and slopes that range from 5-25%; have a loam to fine sandy loam texture; are strongly acid, and have a moderate susceptibility to erosion (FMC, 1996d; and USDA, 1961).

Anniston and Allen Gravelly Loam, 10-25% slopes, eroded (AcE2) is correlated with disturbed and fragmented forests blocks (generally greater than 100 acres/40 hectares) near the cantonment area. Soil map units Anniston and Allen Gravelly Loams (AbD3, AbC3, AcB2, AcC2, AcD3, and AcD2) occur in smaller blocks (generally less than 100 acres/40 hectares), are generally highly disturbed and fragmented, 6-15% slopes, eroded, that are from 20-70% forested, contain developed and cleared areas, and historically have been frequently and extensively logged. Exotic species are more common in these disturbed forests that are near the cantonment area (FMC, 1996d; and USDA, 1961).

C.1.6 Why the MLP Communities are Present at FMC

The longleaf forests are present at FMC due to Army ownership, range activities, and rough topography. Army ownership and inaccessible terrain helped to limit the extent and frequency of timber harvest. Army range activities ignited wildfires that approximated natural fire regimes. The thin and rocky soil was not suitable for commercial timber production or farming.

In 1949 Roland Harper wrote, "In recent years much of the Blue Ridge in Alabama has been included in the FMC military reservation, the Cheaha State Park, and the Talladega National Forest, which should offer some protection from destructive exploitation. The cities of Jacksonville and Anniston get their water supplies from springs on the slopes and at the bases of these mountains, which is an additional reason for protecting the forests above them (Harper, 1949)."

While fire suppression and public education decreased wildfire in the surrounding region, military training assured that this fire regime was maintained on FMC. These montane forests have been exposed to frequent and recurring wildfire the past hundred years. Military training with pyrotechnic and explosive devices has occurred within these forests since the turn of the century. This has allowed the formation of a more natural fire-maintained forest system than what is encountered on surrounding lands (FMC, 1996e).

This area of rugged topography includes steep ridges that occasionally exceed 2,000 feet (610 meters) in elevation. The majority of the longleaf pine stands at FMC occur on steep, rocky, inaccessible south and west facing slopes. Most accessible areas within these mountains were timbered in the late 1800s to produce charcoal for the local iron industry. After purchase by the Army in the early 1900s, timber harvesting continued in some areas, but in general was less extensive than surrounding areas. Steep slopes and isolated ridges contain relict trees and isolated old growth stands of longleaf pine. There are isolated stands that are 180 years in age, and individual relict trees that are 250 years old (FMC, 1996e).

C.1.7 Maintaining the Mountain Longleaf Pine Ecosystem at FMC

The U.S. Department of Agriculture, Forest Service (USDA-FS) is developing a new stewardship philosophy for the management of southern forests. While the USDA-FS does not manage the FMC forests, a similar management approach would be needed to maintain the MLP ecosystem. This management philosophy takes into account concepts such as: (1) maintenance of biological diversity, (2)

preventing further fragmentation of the southern landscape, (3) maintenance of environmental quality, and (4) balancing economic commodities and ecological values.
Maintenance of diversity in the southern forest requires management strategies that consider regional biogeography and landscape patterns. Compositional, structural, and functional diversity are three important types of diversity. Compositional diversity refers to species numbers, population sizes, and genetic diversity. Structural diversity refers to the variety and arrangement of habitats. Functional diversity refers to variation in ecological processes or interactions, such as nutrient recycling. This new management style is needed due to destruction, fragmentation, simplification, and degradation of habitat by logging, grazing by livestock, mining, construction of reservoirs, military activities, and conversion of natural habitats to roads, urban and industrial areas, and agricultural fields. These activities have resulted in many species becoming threatened or endangered, decrease in numbers of NTMB that use interior forests, increased erosion, increase in exotic species populations, and disappearance of old growth forests (EcoApp, 1992; USDA-FS, 1993; USEPA, 1990; and USEPA, 1993).

The commercial forestry program is currently being excluded from identified SINA at FMC. While decreased logging is a valuable management tool, the 12,000-acre (4,850-hectare) ecosystem needs more than just simple preservation to be maintained. The primary mitigation measure to preserve the MLP ecosystem would be a prescribed burn program. Longleaf pine, white fringeless orchid (WFO), and other fire adapted plants would be out-competed in the long term, if periodic fire does not occur within the forest ecosystem. Natural ecological processes such as fire need to be maintained for the long term viability of the MLP system and the rare species it harbors. Longleaf pine requires fire to maintain its competitive advantage edge in establishing reproduction, and will gradually be replaced by hardwoods and shortleaf pine in the absence of fire. For hardwood control, fires need to occur during the growing season. The transition from ridgetop longleaf pine to cove and bottomland hardwood forest is defined where hydric conditions control the downward extent of fire penetration, creating a natural ecotone between pines and hardwoods. Fire is necessary to maintain the integrity of this system by controlling hardwood and other pine species invasion, maintaining species diversity, reducing fuel loads, and encouraging new longleaf pine recruitment (Boyer, 1991; and Hilton, 1996).

In general, exotic species are adapted to human disturbances and are not fire adapted. Exotic species present at FMC that are currently present in small to moderate numbers include Chinese privet (*Ligustrum sinense*), Kudzu (*Percina* spp.), and Japanese honeysuckle (*Lonicera japonica*). These species are present in small numbers due to the unfragmented condition of the forest and presence of wildfire. The largest concentrations of exotic species occurs in and adjacent to the cantonment area. Smaller populations of exotics occur along roadways, firebreaks, and active ranges. At present, exotic species populations do not appear to be spreading, and are not large enough to be considered a serious threat to native flora.

Longleaf pine is adapted to frequent growing season fires. Longleaf pine is resistant to fire due to thick bark on its lower stem and unique growth habit. Low intensity fire damages hardwood trees, injuring the thinner bark and facilitating rot and weakening of the tree. More severe fires will kill the aboveground portions of hardwoods. Growing season fires result in greater mortality for hardwoods and other pine species (with diameters less than eight inches). Most hardwood species will resprout after a single burn. Repeated burns will eventually control hardwoods (Maceina, 1996; and Croker, 1975).

Shelterwood cuts and prescribed fire is an effective way to establish and regenerate longleaf pine. Clearcutting is of limited use in natural regeneration of longleaf pine. Longleaf pine seeds, unlike other pines, begin to germinate as soon as they contact soil, and a "seedbank" does not build-up in the soil. Growing season burns every one to three years will result in the highest diversity of grasses, legumes, composites, and other forbs. Growing season burn benefits also include rapid herbaceous regeneration, synchronized blooming, and higher densities of herbaceous vegetation (Maceina, 1996; and Croker, 1975).

C.1.8 Current Management Programs/Ongoing Research

Auburn University, working through the USDA-FS, is characterizing and mapping existing MLP communities and will develop management and restoration recommendations as part of their work (FWEC, 1996). This research by Auburn University will help the Army manage the MLP ecosystem until disposal occurs. These management and restoration recommendations will also provide valuable information for potential future managers of the MLP ecosystem. Future managers should also consider the current and historical level of "management" that the Army conducted to maintain the MLP ecosystem. The current staff at FMC that is devoted to natural resource management is equivalent to about five full time personnel. The current staff secures and appropriates funding, oversee various biological surveys, review environmental reports, prepare environmental constraint maps and pamphlets, maintain records and files, conduct environmental debriefings and educational programs, post T & E locations, perform prescribed burns, cultivate wildlife food plots, manage white-tailed deer hunts and run check stations, develop forestry and wildlife management plans (such as Integrated Longleaf Restoration Plan, Natural Resource Management Plan & Endangered Species Management Plan), monitor endangered species locations for disturbance, select areas and secure bids for areas to be included in the commercial forestry program, oversee lakes open for fishing, implement erosion control projects, coordinate with regulatory agencies (such as USFWS & ANHP), and ensure compliance with environmental permits and regulations.

The MLP ecosystem at FMC has also received indirect benefits from being included within the boundaries of a military installation that conducts range activities. Most of the locations that contain SCC are included within controlled range areas. Military police and other military personnel not directly involved with or funded by natural resource management, prevent access to and potential impact to SCC. Future prescribed burn regimes would have to consider the manpower and cost to maintain existing firebreaks and crews that are not now supported by the natural resource division at FMC.

C.2 SPECIES AND HABITATS OF CONCERN

General lists of plants (Table C.6) and animals (Table C.7) that are considered of conservation concern are included in subsection C.1.5. Subsections C.2.1 through C.2.4 includes additional discussion on selected species.

C.2.1 Special Interest Natural Areas

As part of the Endangered Species Management Plan, eleven SINAs have been designated on the Main Post of FMC (see Table C.8 and Figure C.2). SINAs are communities that are rare, sensitive, unique, or ecologically important. SINAs were developed to support the management of SCC. These SINAs are included in the approximately 12,000 acres (4,850 hectares) of forest that is largely unfragmented. MLP communities are a significant component of this forest ecosystem. The continuity of this forest is critical to the long-term maintenance of the smaller SINA and the health of the longleaf pine component. The majority of the SINAs and SCC are fire adapted or benefit indirectly from the overall conditions created by fire (FMC, 1996d; and Hilton, 1996).

Figure C.2 indicates the locations most likely to contain current, restorable, and/or historical MLP communities. The purpose of the figure is designed to illustrate the estimated abundance and likely juxtaposition of the MLP communities at FMC. The areas most likely to contain these communities were predicted using the best available information. MLP locations are not based on comprehensive or specific surveys for MLP communities. Auburn University is currently conducting a survey of the MLP communities at FMC that is expected to be completed in 1999.

The location of MLP communities on Figure C.2 was based on the expected occurrence of xeric (dry) conditions and wildfire; and current forest types (pine, pine/hardwood, hardwood/pine, and hardwood - see Figure C.1), which were determined by using aerial photographs. Location of current tracer and flare ranges, and historical artillery ranges were considered when inferring historical occurrence of fire.

Steepness of slope, topographic position, slope face, and soil type were considered when predicting likely xeric conditions. Areas shown as MLP communities on this figure may not actually contain stands of longleaf pine due to insufficient wildfire or prescribed burns, planting of loblolly pine, historic logging, or other factors. Conversely, it should also be noted that some of the areas not shown as probable locations may actually contain MLP communities. (RMS, 1984; FMC, 1996d; USGS, 7.5; FMC, 1997c; USDA, 1961).

Table C.8 Special Interest Natural Areas

SINA Name	Comments/Description
Mountain Longleaf Pine Ecosystem	Approximately 12,000 acres (4,850 hectares) largely unfragmented forest matrix in which other SINA, NTMB, plant and animal SCC exist. Only known natural and fire maintained examples of this MLP communities on a landscape scale.
Marcheta Hill Orchid Seep	The largest forested seep on the installation. Contains white fringeless orchid, rose pink, soapwort gentian, and Diana butterfly. Maintained and enhanced by tracer range wildfire. Probable jurisdictional wetland.
Bains Gap Seep	Small stream seepages that contain Fraser's loosestrife and a SCC caddisfly. Susceptible to erosion.
South Branch Cane Creek	Headwaters of this stream contain 17 species of SCC, rare, and endemic caddisflies. Cane Creek contains the coldwater elimia (*Elimia gerhardti*). Adjacent to a 1.5 acre (0.6 hectare) chemical munitions disposal site currently under investigation.
Cave Creek Seep	Headwaters of this stream have been noted to contain pink lady's slipper, soapwort gentian, and white fringeless orchid. Enhanced by occasional wildfire.
Moorman Hill Mountain Juniper	Contains common juniper. FMC is a southern range extension for this species. Enhanced by low intensity fires.
Stanely Hill Chestnut Oak Forest	Largest tract of mesic woodland on the installation. Considered an important area for breeding NTMB. Susceptible to wildfire from April to June.
Reynolds Hill Turkey Oak	Area dominated by mature longleaf pine. Contains a small disjunct population of turkey oak. Fire is critical to maintaining this SINA.
Davis Hill Honeysuckle	The upper slopes of Davis Hill contain yellow honeysuckle.
Marcheta Hill Crow Poison Seep	Small headwater seep that contains the plant known as crow poison. Closely associated with Marcheta Hill Orchid Seep.
Frederick Hill Aster Site	Contains the only documented population of sky-blue aster in Alabama. Fire is needed to maintain openings in the canopy.

Source: FMC, 1996d

C.2.2 Neotropical Migratory Birds and the Main Post Forests

Fort McClellan contains diverse populations of NTMB. This diversity is due to the large size of the installation, unfragmented condition of the forests, diversity of forest types present, and being connected to other large blocks of forest. Forest cover, and NTMB habitat as related to forest cover, is shown in Figure C.3. Species present at FMC that are potential breeders and have high scores in the Partners in Flight Prioritization Scheme for the Southeastern U.S. are listed in Table C.9. Species listed in Table C.9 are rapidly declining in the Southern Ridge and Valley physiographic province. The reasons for the decline of these species may include the need for large unfragmented blocks of forest, the use of habitat types that have experienced large scale reductions or modifications, habit of nesting on or close to the ground (see Table 4.21), and use of tree cavities (Webb, 1996a; and USDA-FS, 1992).

FIgure C.2 Sensitve Habitats
(11 X 17 color)

Table C.9 High Priority Neotropical Migrant BirdsOccuring on Fort McClellan	
Common Name	Scientific Name
cerulean warbler[FI]	*Dendroica cerulea*
Swainson's warbler[FI]	*Limnothlypis swainsonii*
prothonotary warbler[FI,CV]	*Protonotaria citrea*
wood thrush[FI,MO]	*Hylocichla mustelina*
northern prairie warbler	*Dendroica discolor*
blue-winged warbler	*Vermivora pinus*
worm-eating warbler[FI,MO]	*Helmitheros vermivorous*
Louisana waterthrush[MO]	*Seiurus motacilla*
Acadian flycatcher[FI]	*Empidonax virescens*
yellow-throated vireo[FI,MO]	*Vireo flavifrons*
black-billed cuckoo	*Coccyzus erythropthalmus*
yellow-billed cuckoo	*Coccyzus americanus*
eastern wood-pewee[MO]	*Contopus virens*
great crested flycatcher[CV]	*Myiarchus crinitus*
white-eyed vireo	*Vireo griseus*
Kentucky warbler[FI]	*Oporornis formosus*
orchard oriole	*Icterus spurius*
Notes: FI-Forest Interior; CV-Cavity Nesting; MO-more abundant in mature/old growth forests	
Source: USDA-FS, 1992; and Finch, 1991	

Figure C.3 indicates areas considered to be fragmented, unfragmented, and interior forest. These relative classifications refer to the size and juxtaposition of forest blocks. Fragmented forest has limited value for most species of NTMB, unfragmented forest provides moderate habitat values to most species, and interior forest provides the highest quality habitat. Some species can reproduce successfully only in what is considered to be interior forest and are referred to "forest interior" species. These determinations are based on surveys that indicate that large blocks of forest (564 to 1,335 hectares/1,394 to 3299 acres) generally support more dense populations of neotropical migrants than small forest fragments (4 to 92 hectares/10 to 227 acres). For Figure C.3 fragmented forest was defined as small blocks of forest that were significantly dissected by roads or other types of development; unfragmented forest as medium to large forest blocks that are contiguous and relatively free of roads and other types of development; and interior forest was defined as unfragmented forest tracts on FMC that are greater than 564 hectares (1,394 acres) in size that do not have roads, powerlines or other openings greater than 13.5 meters (44 feet) in width, and are at least 300-600 meters (984 to 1,969 feet) from fragmented forest or significant development. The interior forests on Main Post provide habitat for many species that are unable to adapt and survive in early successional or disturbed cover types (Webb, 1996a; Hill, 1996, and Finch, 1991).

Growing-season fire-maintained longleaf pine habitats support many shrub-scrub neotropical migrant species. These open pine habitats when managed on a large scale (1000's of hectares) should provide a more natural habitat for many species currently dependent upon oldfields and clearcuts and undergoing widespread decline, e.g. prairie warbler (*Dendroica discolor*), (USDA-FS, 1992).

Fragmented forests generally have higher populations of nest predators such as blue jays, raccoon, opossum, and fox. Low nesting species in general are more susceptible to nest predators. Fragmented

forests often also have higher populations of the brown-headed cowbird. The brown-headed cowbird is a nest parasite that lays its eggs in the nests of other species. Many "forest edge" bird species have the ability to recognize the foreign egg and will expel the egg from the nest, build over the foreign egg, or build

Figure C.3 Forest Cover and NTMB habitat
(11 X 17 Black & White)

a new nest. Forest interior species of birds often will not recognize the foreign egg, and will hatch and raise the cowbird to the detriment to its own brood (Hill, 1996).

Many cavity-using NTMB do not have the ability, as do woodpeckers for example, to excavate their own holes. Consequently these species rely on abandoned cavities of other species or natural defects in trees. Woodpeckers that occur at FMC include red-bellied (*Melanerpes carolinus*), downy (*Picoides pubscens*), hairy (*Picoides villosus),* and pileated (*Dryocopus pileatus*). Old growth forests usually contain more trees with knotholes, heartrot, lightning strike, and cavities abandoned by woodpeckers.

Agencies and organizations concerned with NTMB conservation emphasize the need to consider management issues on a landscape scale. The minimum size for landscape consideration for NTMB habitat is approximately 75,000 acres (30,350 hectares). The unfragmented FMC forests total approximately 12,000 acres (4,850 hectares), i.e., are not large enough to be considered on a landscape scale when considering jurisdictional boundaries only. The leased Choccolocco corridor connects FMC to forests to the north, east, and south. This connection with the Talladega National Forest is significant in that it provides a contiguous forest cover of much larger proportions. If jurisdictional boundaries are overlooked, then the FMC forest ecosystem, via the Choccolocco corridor (to be retained by the Alabama State Forestry Commission), is part of a forest block large enough to be considered on a landscape scale (Hilton, 1996; Workshop, 1996; USDA-FS, 1992; and USDA-FS, 1993).

C.2.3 Red Cockaded Woodpecker (RCW) and the Mountain Longleaf Pine Communities

The RCW (*Picoides borealis*) is endemic to the pine forests of the southeastern U.S. This bird prefers open park like stands of pine, particularly longleaf pine. Most authorities believe that RCW will not tolerate dense hardwood stocking in the midstory. The RCW uses cavities in trees for nesting and uses trees that average more than 80 years old. The decrease in old-growth pine throughout the southeastern U.S. has contributed to the decline in numbers of this species (USFWS, 1985).

The RCW is not currently present at FMC. Refer to subsection 4.11.4.2 for a discussion concerning historical occurrence of the RCW at FMC. Maintaining habitat suitable for potential recolonization may help this species to recover. Ecological land management activities, compatible with management of other SCC and the MLP ecosystem, that would help to maintain suitable habitat for the RCW at FMC include the following:

- Conducting periodic forest surveys to accurately determine the quantity and quality of potential foraging and nesting habitat for the RCW;
- Longleaf pine would not be regenerated to other pine species. Where other species have either replaced longleaf pine (due to fire suppression) or been artificially established on sites historically forested with longleaf, direct forest management towards regeneration back to longleaf;
- Midstory Control. The preferred method would be prescribed burning at least every three years in longleaf areas considered to be suitable habitat;
- Maintaining sufficient old growth pine stands by lengthing timber harvesting rotations to 120 years for longleaf pine. Rotation ages would not apply to stands of loblolly pine, or other locations that historically contained longleaf (USACE, 1997a; USACE, 1997b; and USDA-FS, 1993).

C.2.4 White Fringeless Orchid (WFO) and the Mountain Longleaf Pine Ecosystem

As recently as 1992, the WFO was considered to be extirpated from the Ridge and Valley physiographic province. The species is known and/or has been known to occur in Alabama, Tennessee, Kentucky, Georgia, Mississippi, North Carolina, South Carolina, and Virginia. WFO is usually found in deep poorly drained soils that are acidic. Populations are usually found in boggy streamheads. The WFO is often associated with forests with an open canopy that contain red maple and blackgum. The Marcheta Hill Orchid Seep contains one of the largest known populations of this orchid. The Marcheta Hill Orchid Seep is a probable jurisdictional wetland (see Table C.10). See Table C.11 for a list of plants that are commonly found in forested seeps at FMC. There has not been extensive or systematic surveys of all the

seeps that occur at FMC and is it possible that additional populations of the WFO may be found at FMC (Shea, 1992; and FMC, 1996d).

Management activities, compatible with management of other SCC and the MLP ecosystem, that would help to maintain WFO populations at FMC include the following:

- Identifying additional populations and habitat requirements through periodic surveys;
- Understanding the biological system under consideration and using an ecological approach to land management;
- Establishing permanent buffers around known populations;
- Protecting a large enough area to allow prescribed burning; and
- Protecting the watershed or recharge area for the seeps.

C.3 SUMMARY

The MLP ecosystem at FMC appears to be functioning as an ecological unit, i.e., is greater than the sum of its parts. This unique ecosystem has 12,000 acres (4,850 hectares) of largely unfragmented forest, longleaf pine communities, SINA, SCC, NTMB, wetlands, stands of old growth forest, a mosaic of pine and hardwood forest types, and a relative lack of exotic species. See Figure C.4. This ecosystem also has potential RCW habitat. One of the largest known populations of the white fringeless orchid occurs here. In addition this forest ecosystem protects water quality by preventing soil erosion and is good habitat for common wildlife species such as white-tailed deer and wild turkey. Reduced logging frequency and intensity along with periodic wildfire were crucial components in the ecology and maintenance of this ecosystem.

Longleaf pine forests are considered one of the most species rich floral communities in temperate areas (Peet, 1993). The Alabama Natural Heritage Program, School of Forestry at Auburn University, USFWS Central Gulf Coast Ecosystem Team, Nature Conservancy, U.S. Forest Service, and others (see Section 10 in Volume I) have indicated that FMC contains the best remaining known example of the MLP component of the longleaf pine ecosystem. There was concensus among these organizations and individuals that the MLP ecosystem at FMC was important in maintaining the MLP communities, the SINA's, SCC and NTMB habitats. The management of Main Post in a contiguous tract represents an important contribution to conserving regional biodiversity (USDA-FS, 1994).

Table C.10 (pg.1)
Marcheta Hill Seep Data Form

Table C.10 (pg.2)

Table C.11 Plants Associated with Forested Seeps at FMC

Common Name	Scientific Name	Wetland Indicator Category*
tag alder	*Alnus serrulata*	FACW+
swamp dogwood	*Cornus foemina*	FACW-
green ash	*Fraxinus pennsylvanica*	FACW
winterberry	*Ilex verticillata*	FACW
male-berry	*Lyonia ligustrina*	FACW
sweet bay	*Magnolia virginiana*	FACW+
swamp azalea	*Rhodoendron viscosum*	FACW+
high-bush blueberry	*Vaccinium corymbosum*	FACW
possum-haw	*Viburnum nudum*	FACW+
sedge	*Carex alata*	OBL
sedge	*Carex folliculata*	OBL
white turtle-head	*Chelone glabra*	OBL
spikerush	*Eleocharis obtusa*	OBL
spikerush	*Eleocharis nigrescens*	FACW
Joe-pye weed	*Eupatorium fistulosum*	FAC+
soapwort gentian	*Gentiana saponaria*	FACW-
cinnamon fern	*Osmunda cinnamomea*	FACW+
royal fern	*Osmunda regalis var. spectabilis*	OBL
cowbane	*Oxypolis rigidior*	OBL
warty panic grass	*Panicum verrucosum*	FACW
switchgrass	*Panicum virgatum*	FAC+
arrow arum	*Peltandra virginica*	OBL
yellow-fringed orchid	*Platanthera ciliaris*	FACW
green wood orchid	*Platanthera clavellata*	OBL
white-fringeless orchid	*Platanthera integrilabia*	OBL
primrose-leafed violet	*Viola primulifolia*	FACW
netted chain fern	*Woodwardia areolata*	OBL

Notes: * Wetland Indicator Category:
OBL = obligate wetland plant (estimated probability of wetland occurrance >99%);
FACW = facultative wetland plant (estimated probability of wetland occurrance 67-99%);
FAC = facultative wetland plant (estimated probability of wetland occurrance 33-66%);
positive sign (+) indicates a frequency towards the higher end of the category; and
negative sign (-) indicates a frequency towards the lower end of the category.

Sources: Whetstone, 1996; and USFWS, 1988

Figure C-4 Natural Resource Composite
(11 X 17 Color)

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APPENDIX D: ECONOMIC IMPACT FORECAST SYSTEM (EIFS) METHODOLOGY

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Economic Impact Forecast System (EIFS) Methodology

D.1 INTRODUCTION

The U.S. Army Construction Engineering Research Laboratories (USACERL) have developed a computer-based model to provide a systematic method for evaluating the regional socioeconomic effects of government actions, such as military base operations and military realignments. This model is the Economic Impact Forecast System (EIFS) Model which was specifically designed for evaluating the effects of military actions such as construction programs, mission changes, or operations and maintenance programs. The following subsections respectively describe the EIFS Model methodology, and the inputs and outputs for the various FMC related actions pertaining to existing operations and reuse.

D.2 ECONOMIC IMPACT FORECAST SYSTEM METHODOLOGY

EIFS is a regional system best suited for analysis at the county or higher level. Thus, the results of the analysis for Fort McClellan are applied to a regional area and not disaggregated to the local municipal or township level. In this regard, the surrounding eight-county area (Calhoun, Cherokee, Clay, Cleburne, Etowah, Randolph, St. Clair and Talladega) has been defined by the EIFS Model as the region of influence for this EIFS assessment. This defined area represents the outer limit of a 60-minute or 50-mile commute, and the primary trade area for personnel associated with the installation. In addition, 100 percent of the combined civilian and military personnel associated with FMC in addition to retired military personnel reside within this eight-county area.

Using employment and income "multipliers" developed with the comprehensive database combined with economic export base techniques, EIFS estimates the regional economic impacts of actions resulting in changes in personnel or expenditures. These multipliers are applied to the direct economic effects of an action to calculate the total impacts upon the region. For example, ten new manufacturing jobs may spin off additional new jobs in several different sectors of the regional economy. EIFS evaluates socioeconomic impacts in terms of change in sales (business) volume, employment and personal income. EIFS also estimates other demographic indicators such as change in population, school children, demand for housing and government revenues. However, these demographic indicators are calculated only for those civilian and military personnel directly involved with a military action.

Two submodels of EIFS are executed to actually model the economic impacts of existing operations (1995). These are the "*Standard*" (Operations and Maintenance) forecast model, and the *"Training"* forecast model. Both the "standard" and "training" models are used to estimate the impacts of ongoing missions/operations. The "standard" model was used to assess the economic impacts of the permanent party military stationed and civilian personnel employed at FMC, and the economic impacts under each of the alternative reuse plans. The "training" model was used for a separate assessment of the economic

impacts of the military trainees since their off-post consumption (propensity to consume), housing and school enrollment impacts are considerably different than that of permanent party military. In addition, the *"Construction"* model was utilized for assessing the impacts of facility construction under each of the three reuse alternatives..

D.3 EIFS MODEL INPUTS

D.3.1 Existing or Change in Value of the Following Inputs:

- Expenditures for procurement of services and supplies for operations;
- Civilian employment;
- Average annual civilian income;
- Military employment (permanent party military and trainees);
- Average annual income of military personnel;
- Percent of employees expected to relocate from outside of the ROI;
- Percent of military personnel residing on base; and,
- Construction expenditures for reuse.

The EIFS model uses price indices, or "deflators", as a means of converting dollars to equivalent dollar values in order to reflect price-adjustments as a result of inflation. The Consumer Price Index (CPI) and Producer Price Index (PPI) are the indices used in both the "standard" and "training" models, while the "construction model" uses the CPI and Engineering News-Record (ENR) construction cost index. The latest EIFS default values for these indices are for the year 1993. In order to more accurately reflect the value of current and future projected dollars these price indices were adjusted upward to reflect FY95, or the baseline year of operations. The adjustment factors used reflect recent (previous three years) annual average increases in these indices.

D.3.2 Calculation of Individual Inputs

- **Expenditures for Services and Supplies.** Expenditures for services and supplies correspond to the operating budget of the installation, excluding military and civilian salaries, under baseline conditions. Included are contractual services, military clothing, equipment, utilities and miscellaneous expenses. The annual expenditures used in the EIFS model reflect FY95 expenditures based upon information provided by the FMC-Directorate of Resource Management (DRM).

- **Civilian Employment.** Civilian employment is based on information provided by the FMC DRM. Current (1995) total DA and non-DA civilian employment is 2,239.

- **Average Income of Civilian Employees.** Current annual Income is estimated based upon information provided by the FMC DRM. The average salaries of DA civilian, NAF, DFAS and contractual employees were calculated and weighted to arrive at an overall current (FY95) average civilian salary of $28,143.

- **Military Employment**. Current military employment associated with FMC is based upon information provided by the FMC DRM. For the EIFS modeling purposes the number of current (FY95) permanent party military personnel is 2,166, and 3,160 trainees/students adjusted to a full-time annual basis.

- **Average Income of Military Personnel**. Current annual income is based upon information provided by the FMC DRM. Housing allowance and other benefits are included in this figure for permanent party personnel, but not for the trainees.

- **Percent of New Employees Expected to Relocate (Live Outside of ROI).** It is assumed that a certain percentage of the new civilian employees associated with the reuse will relocate to the ROI

from outside the region. It is further assumed that less than one percent of the new employees would reside outside of the eight-county ROI. This is based upon the current geographic residency distribution of military personnel and civilian employees. The percent of new employees expected to relocate was adjusted to a "net relocation factor" in the EIFS Model to account for the simultaneous out-migration of military and civilian personnel associated with the installation under baseline conditions.

- **Percent of Military Living on Base.** The percent of permanent party military currently living on base is approximately 34 percent as defined by information provided from FMC DRM. It is assumed that 100 percent of the trainees reside on base.

- **Construction Costs.** The EIFS "Construction Model" was executed to estimate the economic impacts of one-time construction of the reuse facilities under each of the three alternative reuse plans. Projected costs are based on current construction costs/square foot for residential, commercial, industrial and institutional facilities in the Anniston area. The EIFS "default value" (30 percent) was used for estimating the percent of construction workers expected to relocate into the ROI from elsewhere.

D.4 EIFS MODEL FORECASTS

The following section provides the EIFS model forecasts of the economic impacts of Fort McClellan on the eight-county ROI resulting from existing operations (D.4.1); alternative reuse plans (D.4.2); and reuse facility construction (D.4.3) under the three reuse intensity scenarios.

D.4.1 EIFS, EXISTING OPERATIONS

STANDARD EIFS FORECAST MODEL - EXISTING OPERATIONS
(Permanent Party Military and Civilian)

Project Name: Fort McClellan EIS

Enter d to enter your own price deflators			
RETURN to use the default price deflators (latest year): d			
Price deflator for baseline year (ex b.v.)	(CPI - 1987):	(100.0)	
Price deflator for output (ex b.v.)	(CPI - 1995):	133.3	
Price deflator for baseline year (business volume)	(PPI-1987):	(100.0)	
Price deflator for output (business volume)	(PPI - 1995):	121.6	
If entering total expenditures, enter		1	
local expenditures, enter		2 : 1	
Change in expenditures for services and supplies:		$ 45,417,000	
Change in expenditures for local services and supplies:		24,404,670	(calculated)
price deflator (PPI - 1995):		121.6	
Change in civilian employment:		2,239	
Average income of affected civilian personnel:		$ 28,143	
price deflator (CPI - 1995):		133.3	
Change in military employment:		2,166	
Average income of affected military personnel:		$ 24,350	
price deflator (CPI - 1995):		133.3	
Percent of military living on-post:	0.337		

******** STANDARD EIFS MODEL FORECAST FOR FORT MCCLELLAN EIS ********

Export income multiplier:		2.1614
Change in local		
Sales volume	Direct:	$ 90,693,000

	Induced:	$ 105,335,000	
	Total:	$196,029,000	(3.180%)
Employment	Direct:	812	
	Total:	6,160	(3.678%)
Income	Direct:	$ 12,253,000	
	Total (place of work):	$ 142,238,000	
	Total (place of residence):	$142,238,000	(2.375%)
Local population:		10,805	(2.663%)
	Local off-base population:	8,987	
	Number of school children:	1,878	
Demand for housing	Rental:	1,478	
	Owner occupied:	2,197	
Government expenditures:		$ 12,696,000	
Government revenues:		$ 14,151,000	
Net Government revenues:		$ 1,456,000	

STANDARD EIFS FORECAST MODEL - EXISTING OPERATIONS
(Trainees Only)

Project Name: Fort McClellan EIS

Enter d to enter your own price deflators
RETURN to use the default price deflators (latest year): d

Price deflator for baseline year (ex b.v.)	(CPI - 1987):	(100.0)	
Price deflator for output (ex b.v.)	(CPI - 1995):	133.3	
Price deflator for baseline year (business volume)	(PPI-1987):	(100.0)	
Price deflator for output (business volume)	(PPI - 1995):	121.6	
If entering total expenditures, enter		1	
local expenditures, enter	2 : 1		
Change in expenditures for services and supplies:		$ 0	
Change in expenditures for local services and supplies:		0	(calculated)
price deflator (PPI - 1995):		121.6	
Number of (non-basic) trainees:		3,160	
Average number of trainees:	$ 10,500		
price deflator (CPI - 1995):		133.3	
Percent of trainees living on-post:		100	

******** TRAINING IMPACT FORECAST FOR FORT MCCLELLAN EIS ********

Export income multiplier:		2.1614	
Change in local			
Sales volume	Direct:	$ 8,899,000	
	Induced:	$ 10,335,000	
	Total:	$19,234,000	(0.312%)
Employment	Direct:	80	
	Total:	3,332	(1.990%)
Income	Direct:	$ 1,202,000	
	Total (place of work):	$ 35,779,000	
	Total (place of residence):	$ 35,779,000	(0.597%)
Local population:		3,160	(0.779%)
	Local off-base population:	0	
	Number of school children:	0	
Demand for housing	Rental:	0	

	Owner occupied:	0	
Government expenditures:		$ 168,000	
Government revenues:		$ 2,274,000	
Net Government revenues:		$ 2,105,000	
Civilian employees expected to relocate:		0	
Military employees expected to relocate:		3,160	

COMPOSITE EIFS FORECAST - EXISTING OPERATIONS
PP MILITARY, CIVILIANS AND TRAINEES
(Represents Sum of Previous Two Model Outputs)

Export income multiplier:		2.1614	
Change in local			
Sales volume	Direct:	$ 99,592,000	
	Induced:	$ 115,670,000	
	Total:	$ 215,262,000	(3.492%)
Employment	Direct:	892	
	Total:	9,492	(5.668%)
Income	Direct:	$ 13,455,000	
	Total (place of work):	$ 178,017,000	
	Total (place of residence):	$178,017,000	(2.972%)
Local population:		13,965	(3.442%)
Local off-base population:		8,987	
Number of school children:		1,878	
Demand for housing	Rental:	1,478	
	Owner occupied:	2,197	
Government expenditures:		$ 12,864,000	
Government revenues:		$ 16,425,000	
Net Government revenues:		$ 3,561,000	

D.4.2 EIFS, REUSE

The EIFS Standard Model was executed to estimate the economic impacts under each of the three alternative reuse intensity scenarios. Input values required for execution of the EIFS Model for the reuse activity include the following which are also utilized in the EIFS Model for estimating the impacts of existing operations.

- **Expenditures for Services and Supplies.** An expenditure to employee ratio of $26,000 was used for manufacturing employment, and $21,000 for other employment directly associated with reuse activities under each of the three reuse scenarios. Table E.1 indicates the calculation of the total estimated expenditures under each of the three reuse intensity levels.

- **Civilian Employment**. Civilian employment directly involved in the proposed reuse activities was projected by dividing the estimated total floor area by the employee density (sf per employee) for each respective proposed reuse.

Table D.1
EIFS Model Input Parameters, Reuse

	Expenditure per Employee [1]	Employment	Expenditures
MEDIUM HIGH INTENSITY			

Manufacturing	$26,000	7,500	$195,000,000
Other Uses	21,000	6,489	136,269,000
Total	na	**13,989**	**$331,269,000**
Less 1995 Baseline	na	4,405 [2]	45,417,000 [4]
CHANGE FROM 1995	**na**	***9,584***	***$285,852,000***
Average Income/Employee ($18,250) [3]			
MEDIUM INTENSITY			
Manufacturing	$26,000	5,150	$133,900,000
Other Uses	21,000	3.842	80,682,000
Total	na	**8,992**	**$214,582,000**
Less 1995 Baseline	na	4,405	45,417,000
CHANGE FROM 1995	na	***4,587***	***$169,165,000***
Average Income/Employee ($18,250)			
MEDIUM LOW INTENSITY			
Manufacturing	$26,000	3,577	$93,002,000
Other Uses	21,000	2,475	*51,975,000*
Total	na	**6,052**	**$144,977,000**
Less 1995 Baseline	na	4,405	*45,417,000*
CHANGE FROM 1995	**na**	**1,647**	***$99,560,000***
Average Income/Employee ($18,250)			

Notes: 1 Manufacturing expenditure/employee derived from 1987 U.S. Census of Manufacturing (cost of materials divided by number of employees X .50), adjusted to 1995 baseline year. Other expenditures/employee derived from 1995 average employee earnings in retail, office, services ($14,000) multiplied by a factor of 1.5

2 Includes both civilian and military employees (2,239 + 2,166).

3 Bureau of Economic Analysis. Earnings by Industry, 1994.(adjusted to 1995 baseline).

4 1995 Baseline: FMC Operating Budget for Services and Supplies (does not include salaries).

Source: Parsons, Harland Bartholomew & Associates, Inc.

- **Average Annual Civilian Income**. The average annual income of the potential employees associated with the reuse activities was estimated based on the Bureau of Economic Analysis, Earnings by Industry (1994) data, and adjusted to the 1995 baseline year. The average annual income of $18,250 represents the baseline year average earnings of industrial, retail and service workers in Calhoun County.

- **Percent Expected to Relocate**. The percent of the new civilian employment expected to relocate from the outside the FMC ROI to supplement the local labor force is based on estimates provided by EDAW which were developed during the preparation of the FMC Reuse Plan. These estimates are based on the size and skills of the current labor force pool of the FMC ROI, and were adjusted in the EIFS Model to account for the loss of population associated with the closure of the installation.

Following are the EIFS Model inputs and forecast outputs for each of the three alternative reuse plans. To determine the net change in economic impacts, the composite impacts of existing baseline operations (e.g. sales volume, employment, income, population) were subtracted from the impacts under each reuse alternative.

STANDARD EIFS FORECAST MODEL - REUSE

Project Name: Fort McClellan EIS - MHIR Alternative

Enter d to enter your own price deflators
RETURN to use the default price deflators (latest year): d

Price deflator for baseline year (ex b.v.)	(CPI - 1987):	(100.0)	
Price deflator for output (ex b.v.)	(CPI - 1995):	133.3	
Price deflator for baseline year (business volume)	(PPI-1987):	(100.0)	
Price deflator for output (business volume)	(PPI - 1995):	121.6	
If entering total expenditures, enter		1	
local expenditures, enter		2 : 1	
Change in expenditures for services and supplies:		$ 331,269,000	
Change in expenditures for local services and supplies:		178,006,256	(calculated)
price deflator (PPI - 1995):		121.6	
Change in civilian employment:		13,989	
Average income of affected civilian personnel:		$ 18,250	
price deflator (CPI - 1995):		133.3	
Percent expected to relocate:		0.52	
Change in military employment:		NA	

******** STANDARD EIFS MODEL FORECAST FOR FORT MCCLELLAN EIS ********

Export income multiplier:		2.1614	
Change in local			
Sales volume	Direct:	$ 365,251,000	
	Induced:	$ 424,219,000	
	Total:	$789,169,000	(12.805%)
Employment	Direct:	3,270	
	Total:	21,056	(12.573%)
Income	Direct:	$ 49,345,000	
	Total (place of work):	$ 461,957,000	
	Total (place of residence):	$ 361,957,000	(6.044%)
Local population:		17,582	(4.333%)
	Local off-base population:	17,582	
	Number of school children:	3,021	
Demand for housing	Rental:	1,815	
	Owner occupied:	5,460	
Government expenditures:		$ 37,788,000	
Government revenues:		$ 33,003,000	
Net Government revenues:		-$ 4,785,000	
Civilian employees expected to relocate:		7,274	

STANDARD EIFS FORECAST MODEL - REUSE

Project Name: Fort McClellan EIS - MIR Alternative

Enter d to enter your own price deflators
RETURN to use the default price deflators (latest year): d

Price deflator for baseline year (ex b.v.)	(CPI - 1987) :	(100.0)	
Price deflator for output (ex b.v.)	(CPI - 1995) :	133.3	
Price deflator for baseline year (business volume)	(PPI-1987):	(100.0)	
Price deflator for output (business volume)	(PPI - 1995):	121.6	
If entering total expenditures, enter		1	
local expenditures, enter		2 : 1	
Expenditures for services and supplies:		$ 214,582,000	
Expenditures for local services and supplies:		115,304,904	(calculated)
price deflator (PPI - 1995):		121.6	
Civilian employment:		8,992	

Average income of affected civilian personnel:		$ 18,250	
price deflator (CPI - 1995):		133.3	
Percent expected to relocate (enter <cr> to accept default):		0.40	
Change in military employment:		NA	

******** STANDARD EIFS MODEL FORECAST FOR FORT MCCLELLAN EIS ********

Export income multiplier:		2.1614	
Change in local			
Sales volume	Direct:	$ 235,664,000	
	Induced:	$ 273,711,000	
	Total:	$ 509,375,000	(8.262%)
Employment	Direct:	2,110	
	Total:	13,552	(8.092%)
Income	Direct:	$ 31,838,000	
	Total (place of work):	$ 232,921,000	
	Total (place of residence):	$ 232,921,000	(3.889%)
Local population:		8,693	(2.142%)
	Local off-base population:	8,693	
	Number of school children:	1,493	
Demand for housing	Rental:	897	
	Owner occupied:	2,700	
Government expenditures:		$ 21,756,000	
Government revenues:		$ 19,746,000	
Net Government revenues:		-$ 2,010,000	
Civilian employees expected to relocate:		3,597	

STANDARD EIFS FORECAST MODEL - REUSE

Project Name: Fort McClellan EIS - MLIR Alternative

Enter d to enter your own price deflators		
RETURN to use the default price deflators (latest year): d		
Price deflator for baseline year (ex b.v.)	(CPI - 1987):	(100.0)
Price deflator for output (ex b.v.)	(CPI - 1995):	133.3
Price deflator for baseline year (business volume)	(PPI-1987):	(100.0)
Price deflator for output (business volume)	(PPI-1995):	121.6
If entering total expenditures, enter		1
local expenditures, enter		2 : 1
Expenditures for services and supplies:		$ 44,977,000
Expenditures for local services and supplies:		77,902,896(calculated)
price deflator (PPI - 1995):		121.6
Civilian employment:		6,052
Average income of affected civilian personnel:		$ 18,250
price deflator (CPI - 1995):		133.3
Percent expected to relocate (enter <cr> to accept default):		0.30

******** STANDARD EIFS MODEL FORECAST FOR FORT MCCLELLAN EIS ********

Export income multiplier:		2.1614	
Change in local			
Sales volume	Direct:	$ 158,910,000	
	Induced:	$ 184,565,000	
	Total:	$ 343,474,000	(5.571%)
Employment	Direct:	1,423	
	Total:	9,127	(5.450%)
Income	Direct:	$ 21,469,000	
	Total (place of work):	$ 156,853,000	
	Total (place of residence):	$ 156,853,000	(2.619%)
Local population:		4,388	(1.081%)
	Local off-base population:	4,388	
	Number of school children:	754	
Demand for housing	Rental:	453	
	Owner occupied:	1,363	
Government expenditures:		$ 13,218,000	
Government revenues:		$ 12,464,000	
Net Government revenues:		-$ 754,000	
Civilian employees expected to relocate:		1,816	

D.4.3 EIFS, CONSTRUCTION MODEL

The EIFS Construction Model was executed to estimate the economic impacts of facility construction. Per square foot construction costs were estimated based on *Means Construction Cost Data (1995)* and local sources of information. Included in the construction cost input values are demolition and infrastructure costs, while rehabilitation/renovation costs of existing facilities to be retained are not included. Following are the input and output values in respect to economic impacts of facility construction under each of the three alternative reuse plans.

EIFS CONSTRUCTION FORECAST MODEL

Project Name: Fort McClellan EIS - Construction, MHIR Alternative

Enter d to enter your own price deflators			
RETURN to use the default price deflators (latest year): d			
Price deflator for baseline year (ex b.v.)	(CPI - 1987):	(100.0)	
Price deflator for output (ex b.v.)	(CPI - 1995):	133.3	
Price deflator for baseline year (construction)	(ENR-const-1987):	(100)	
Price deflator for output (construction)	(ENR-const-1995):	126.0	
If entering total expenditures, enter		1	
local expenditures, enter		2 : 1	
Dollar volume of construction project:		$ 320,000,000	
Local expenditures of project:		$ 171,950,903	(calculated)
price deflator (ENR-const - 1995):		126.0	
Percent for labor (enter new value or <cr> to accept default):		(34.2)	
Percent for materials (enter new value or <cr> to accept default):		(57.8)	
Percent allowed for other:		8.00	(calculated)
Percent of construction workers expected to migrate into the area			
(enter <cr> to accept default):		(30.0)	

******** CONSTRUCTION IMPACT FORECAST FOR FORT MCCLELLAN EIS ********

Export income multiplier:		2.1614	
Change in local			
Sales volume	Direct:	$ 146,669,000	
	Induced:	$ 170,348,000	
	Total:	$ 317,016,000	(4.963%)
Employment	Direct:	1,267	
	Total:	5,605	(3.347%)
Income	Direct:	$ 19,123,000	
	Total (place of work):	$ 103,548,000	
	Total (place of residence):	$ 103,548,000	(1.729%)
Local population:		1,948	(0.480%)
	Local off-base population:	1,948	
	Number of school children:	363	
Demand for housing	Rental:	860	
	Owner occupied:	0	
Government expenditures:		$ 7,387,000	
Government revenues:		$ 7,688,000	
Net Government revenues:		$ 301,000	
Civilian employees expected to relocate:		860	
Military employees expected to relocate:		0	

Project Name: Fort McClellan EIS - Construction, MIR Alternative

Enter d to enter your own price deflators			
RETURN to use the default price deflators (latest year): d			
Price deflator for baseline year (ex b.v.)	(CPI - 1987):	(100.0)	
Price deflator for output (ex b.v.)	(CPI - 1995):	133.3	
Price deflator for baseline year (construction)	(ENR-const-1987):	(100.0)	
Price deflator for output (construction)	(ENR-const-1993):	126.0	
If entering total expenditures, enter		1	
local expenditures, enter		2 : 1	
Dollar volume of construction project:		$ 225,000,000	
Local expenditures of project:		$ 120,902,979.10	(calculated)
price deflator (ENR-const - 1995):		126.0	
Percent for labor (enter new value or <cr> to accept default):		(34.2)	
Percent for materials (enter new value or <cr> to accept default):		(57.8)	
Percent allowed for other:		8.00	(calculated)
Percent of construction workers expected to migrate into the area			
(enter <cr> to accept default):		(30.0)	

******** CONSTRUCTION IMPACT FORECAST FOR FORT MCCLELLAN EIS ********

Export income multiplier:		2.1614	
Change in local			
Sales volume	Direct:	$ 103,126,000	
	Induced:	$ 119,776,000	
	Total:	$ 222,902,000	(3.489%)
Employment	Direct:	891	
	Total:	3,941	(2.353%)
Income	Direct:	$ 13,446,000	
	Total (place of work):	$ 72,807,000	
	Total (place of residence):	$ 72,807,000	(1.216%)
Local population:		1,370	(0.338%)
	Local off-base population:	1,370	
	Number of school children:	255	
Demand for housing	Rental:	605	
	Owner occupied:	0	
Government expenditures:		$ 5,194,000	
Government revenues:		$ 5,406,000	
Net Government revenues:		$ 212,000	
Civilian employees expected to relocate:		605	
Military employees expected to relocate:		0	

Project Name: Fort McClellan EIS - Construction, MLIR Alternative

Enter d to enter your own price deflators			
RETURN to use the default price deflators (latest year): d			
Price deflator for baseline year (ex b.v.)	(CPI - 1987):	(100.0)	
Price deflator for output (ex b.v.)	(CPI - 1995):	133.3	
Price deflator for baseline year (construction)	(ENR-const-1987):	(100.0)	
Price deflator for output (construction)	(ENR-const - 1995):	126.0	
If entering total expenditures, enter		1	
local expenditures, enter		2 : 1	
Dollar volume of construction project:		$ 164,000,000	
Local expenditures of project:		$ 88,124,838.10	(calculated)
price deflator (ENR-const - 1993):		126.0	
Percent for labor (enter new value or <cr> to accept default):		(34.2)	
Percent for materials (enter new value or <cr> to accept default):		(57.8)	
Percent allowed for other:		8.00	(calculated)
Percent of construction workers expected to migrate into the area			
(enter <cr> to accept default):		(30.0)	

******** CONSTRUCTION IMPACT FORECAST FOR FORT MCCLELLAN EIS ********

Export income multiplier:		2.1614	
Change in local			
Sales volume	Direct:	$ 75,168,000	
	Induced:	$ 87,303,000	
	Total:	$ 162,471,000	(2.543%)
Employment	Direct:	649	
	Total:	2,873	(1.715%)
Income	Direct:	$ 9,801,000	
	Total (place of work):	$ 53,068,000	
	Total (place of residence):	$ 53,068,000	(0.886%)
Local population:		999	(0.246%)
	Local off-base population:	999	
	Number of school children:	186	
Demand for housing	Rental:	441	
	Owner occupied:	0	
Government expenditures:		$ 3,786,000	
Government revenues:		$ 3,940,000	
Net Government revenues:		$ 154,000	
Civilian employees expected to relocate:		441	
Military employees expected to relocate:		0	

D.5 RATIONAL THRESHOLD VALUES

Using a technique termed the Rational Threshold Value (RTV), the EIFS estimates are compared to the historic trends for each economic indicator (business volume, personal income, employment and population) to determine whether the impacts are significant. To accomplish this, the EIFS model calculates the impacts of each of the above economic indicators as a percentage of the total of that indicator for the region. For example, the increase in employment as a result of the activity might account for a five percent increase in total regional employment. This percentage increase is compared to the normal annual variations in the growth rate for each indicator. EIFS calculates both positive and negative RTVs. If an EIFS impact exceeds the normal positive or negative RTV variation, then the impact is considered to be significant. The historic positive and negative RTVs for the FMC ROI are as follows:

- business (sales) volume = 6.81 (- 5.03) percent
- personal income = 5.63 (- 4.02) percent
- employment = 2.80 (- 3.38) percent
- population = 2.12 (- 0.95) percent.

The EIFS Model was executed separately for the permanent party military/civilian component of existing operations, and the trainees component. The RTV's for each economic indicator are noted in parentheses in each of the respective EIFS forecast models. Following are the cumulative RTV's of these two model executions.

- business (sales) volume = 3.49 percent
- personal income = 2.97 percent
- employment = 5.67 percent
- population = 3.44 percent

An analysis of the RTVs of the above economic indicators indicates that the regional historic RTVs for employment and population are exceeded by existing FMC operations. Thus, FMC operations have a significant impact on the local and regional economy.

RATIONAL THRESHOLD VALUES

AREA: Fort McClellan Region of Influence (ROI)

All dollar amounts are in thousands of dollars.
Dollar adjustment based on CPI (1987=100).

Table D.2
Business Volume (using Non-Farm Income)

Year	Non-Farm income	Adjusted Income	Change	Deviation	%Deviation
1969	701,632	2,075,834			
1970	705,788	1,971,475	-104,359	-139,426	-6.717%
1971	759,447	2,036,051	64,576	29,510	1.500%
1972	851,726	2,206,544	170,493	135,427	6.650%
1973	936,221	2,283,466	76,922	41,856	1.900%
1974	1,016,992	2,235,147	-48,319	-83,385	-3.650%
1975	1,086,353	2,185,821	-49,326	-84,392	-3.780%
1976	1,244,122	2,369,756	183,935	148,869	6.810%
1977	1,412,924	2,527,592	157,836	122,770	5.180%
1978	1,590,569	2,642,141	114,549	79,483	3.150%
1979	1,742,178	2,600,266	-41,875	-76,942	-2.910%
1980	1,894,609	2,489,631	-110,635	-145,701	-5.600%
1981	2,054,050	2,448,212	-41,419	-76,485	-3.070%
1982	2,075,084	2,334,178	-114,034	-149,101	-6.090%
1983	2,228,560	2,432,926	98,748	63,682	2.730%
1984	2,423,291	2,556,214	123,288	88,222	3.630%
1985	2,537,071	2,586,209	29,995	-5,071	-0.200%
1986	2,671,452	2,768,344	182,135	147,069	5.690%
1987	2,849,831	2,849,831	81,487	46,421	1.680%
1988	3,003,274	2,887,763	37,932	2,866	0.101%
1989	3,106,474	2,849,976	-37,787	-72,853	-2.520%
1990	3,207,023	2,796,010	-53,966	-89,033	-3.120%
1991	3,327,373	2,786,745	-9,265	-44,331	-1.586%
1992	3,539,532	2,882,355	95,610	60,544	2.173%

Source: Bureau of Economic Analysis

average yearly change:	35,066	
maximum historic positive deviation:	148,869	
maximum historic negative deviation:	- 149,101	
maximum historic % positive deviation:	6.811	%
maximum historic % negative deviation:	- 6.717	%
positive rtv:	6.811	%
negative rtv:	- 5.037	%

Table D.3
Personal Income

Year	Personal Income	Adjusted Income	Change	Deviation	% Deviation
1969	897,966	2,656,704			
1970	928,124	2,592,525	-64,179	-159,569	-6.006%
1971	1,017,985	2,729,182	136,657	41,267	1.592%
1972	1,142,780	2,960,570	231,388	135,997	4.983%
1973	1,288,329	3,142,266	181,696	86,306	2.915%
1974	1,418,910	3,118,484	-23,782	-119,173	-3.793%
1975	1,596,327	3,211,926	93,442	-1,948	-0.062%
1976	1,804,633	3,437,396	225,471	130,080	4.050%
1977	2,029,341	3,630,306	192,910	97,519	2.837%
1978	2,288,332	3,801,216	170,910	75,520	2.080%
1979	2,565,477	3,829,070	27,854	-67,536	-1.777%
1980	2,863,627	3,762,979	-66,091	-161,481	-4.217%
1981	3,160,405	3,766,871	3,892	-91,498	-2.432%
1982	3,308,205	3,721,265	-45,606	-140,996	-3.743%
1983	3,531,746	3,855,618	134,353	38,962	1.047%
1984	3,807,514	4,016,365	160,747	65,357	1.695%
1985	4,014,179	4,091,926	75,561	-19,829	-0.494%
1986	4,263,057	4,417,676	325,750	230,360	5.630%
1987	4,492,687	4,492,687	75,011	-20,379	-0.461%
1988	4,782,228	4,598,296	105,609	10,219	0.227%
1989	5,041,007	4,624,777	26,481	-68,909	-1.499%
1990	5,339,334	4,655,043	30,266	-65,125	-1.408%
1991	5,613,185	4,655,043	46,117	-49,273	-1.058%
1992	5,956,636	4,850,681	149,521	54,130	1.151%

Source: Bureau of Economic Analysis

average yearly change:	95,390	
maximum historic positive deviation:	230,360	
maximum historic negative deviation:	- 161,481	
maximum historic % positive deviation:	5.630	%
maximum historic % negative deviation:	- 6.006	%
positive rtv:	5.630	%
negative rtv:	- 4.024	%

Table D.4
Employment

Year	Employment	Change	Deviation	% Deviation
1969	136,323			
1970	131,215	-5,108	-6,879	-5.046%
1971	131,612	397	-1,374	-1.047%
1972	135,086	3,474	1,703	1.294%
1973	139,222	4,136	2,365	1.751%
1974	140,312	1,090	-681	-0.489%
1975	139,719	-593	-2,364	-1.685%
1976	144,880	5,161	3,390	2.426%
1977	150,719	5,839	4,068	2.808%
1978	155,419	4,700	2,929	1.943%
1979	157,794	2,375	604	0.389%
1980	158,826	1,032	-739	-0.468%
1981	157,962	-864	-2,635	-1.659%
1982	154,227	-3,735	-5,506	-3.486%
1983	156,291	2,064	293	0.190%
1984	160,959	4,668	2,897	1.854%
1985	161,954	995	-776	-0.482%
1986	163,895	1,941	170	0.105%
1987	167,476	3,581	1,810	1.104%
1988	171,049	3,573	1,802	1.076%
1989	172,442	1,393	-378	-0.221%
1990	173,592	1,150	-621	-0.360%
1991	173,934	342	-1,429	-0.823%
1992	177,055	3,121	1,350	0.776%

Source: Bureau of Economic Analysis

average yearly change:	1,771	
maximum historic positive deviation:	4,068	
maximum historic negative deviation:	- 6,879	
maximum historic % positive deviation:	2.808	%
maximum historic % negative deviation:	- 5.046	%
positive rtv:	2.808	%
negative rtv:	- 3.381	%

Table D.5
Population

Year	Population	Change	Deviation	% Deviation
1969	348,600			
1970	348,200	-400	-3,113	-0.893 %
1971	352,000	3,800	1,087	0.312 %
1972	355,700	3,700	987	0.280 %
1973	360,800	5,100	2,387	0.671 %
1974	366,200	5,400	2,687	0.745 %
1975	371,300	5,100	2,387	0.652 %
1976	381,900	10,600	7,887	2.124 %
1977	386,200	4,300	1,587	0.416 %
1978	394,400	8,200	5,487	1.421 %
1979	398,600	4,200	1,487	0.377 %
1980	404,600	6,000	3,287	0.825 %
1981	409,400	4,800	2,087	0.516 %
1982	404,300	-5,100	-7,813	-1.908 %
1983	410,600	6,300	3,587	0.887 %
1984	409,200	-1,400	-4,113	-1.002 %
1985	406,100	-3,100	-5,813	-1.421 %
1986	405,000	-1,100	-3,813	-0.939 %
1987	405,800	800	-1,913	-0.472 %
1988	406,800	1,000	-1,713	-0.422 %
1989	405,700	-1,100	-3,813	-0.937 %
1990	405,900	200	-2,513	-0.619 %
1991	407,500	1,600	-1,113	-0.274 %
1992	411,000	3,500	787	0.193 %

Source: Bureau of Economic Analysis

average yearly change:	2,713	
maximum historic positive deviation:	7,887	
maximum historic negative deviation:	- 7,813	
maximum historic % positive deviation:	2.124	%
maximum historic % negative deviation:	- 1.908	%
positive rtv:	2.124	%
negative rtv:	- 0.954	%

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APPENDIX E: ENVIRONMENTAL JUSTICE

Environmental Justice

E.1 INTRODUCTION

The term *Environmental Justice*, is often used interchangeably with the term *Environmental Equity*, and refers to the distribution of impacts associated with environmental problems, and the policies and procedures to reduce the differences between population groups in society that bear environmental risks. In this context *Environmental Justice* is intended to ensure the fair treatment of all segments of society. Fair treatment means that no population group should bear a disproportionate share of negative environmental risks or consequences resulting from the operation of industrial, municipal or commercial enterprises, or from the execution of Federal, state and local policies and programs. Population groups in this context refers to groups of people with a common racial or ethnic background, income level, gender, education level, age, or other discriminating feature. Consequently, this concept is based on the principle of fair treatment of people of all races, cultures, and income with respect to the development, implementation, and enforcement of environmental laws, regulations, programs or policies.

The concept of disproportionate environmental impacts on minority and low-income communities in the United States was clearly identified and documented in the 1987 report *Toxic Wastes and Race in the United States*. Since that report several additional studies have been completed which further document a correlation between the location of environmental risks and communities were minorities live. Largely in response to these reports, and other community demands for action to address the causes of disproportionate environmental impacts on minority populations, President Clinton issued Executive Order 12898 which requires each Federal agency to develop an agency-wide environmental justice strategy that identifies and addresses disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations. Further definition of the concept of *Environmental Justice* with respect to children was provided in Executive Order 13045, Protection of Children From Environmental Health Risks and Safety Risks.

E.2 EXECUTIVE ORDER 12898 - ENVIRONMENTAL JUSTICE

Executive Order 12898, issued in February 1994, directs federal agencies to identify and analyze the potential socioeconomic impacts of proposed actions in accordance with health and environmental laws. In this regard, the Executive Order requires each federal agency to make the achievement of environmental justice a part of its mission by identifying and addressing disproportionately high and adverse human health and environmental effects of its programs, policies and activities on minority populations and low-income populations.

Text from Executive Order 12898 has been reproduced below.

February 11, 1994

EXECUTIVE ORDER

FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Section 1-1. IMPLEMENTATION.

1-101. Agency Responsibilities. To the greatest extent practicable and permitted by law, and consistent with the principles set forth In the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Marian islands.

1-102. Creation of an Interagency Working Group on Environmental Justice

(a) Within 3 months of the date of this order, the Administrator of the Environmental Protection Agency ("Administrator") or the Administrator's designee shall convene an Interagency Federal Working Group on Environmental Justice ("Working- Group"). The Working Group shall comprise the heads of the following executive agencies and offices, or their designees: (a)Department of Defense; (b) Department of Health and Human Services; (c)Department of Housing and Urban Development; (d) Department of Labor; (e) Department of Agriculture; (f) Department of Transportation; (g) Department of Justice; (h) Department of the Interior; (i) Department of Commerce; (j) Department of Energy; (k) Environmental Protection Agency; (1) Office of Management and Budget; (m) Office of Science and Technology Policy; (n) Office of the Deputy Assistant to the President for Environmental Policy; (o) Office of the Assistant to the President for Domestic Policy; (p) National Economic Council; (q) Council of Economic Advisers; and (r) such other Government officials as the President may designate. The Working Group shall report to the President through the Deputy Assistant to the President for Environmental Policy and the Assistant to the President for Domestic Policy.

(b) The Working Group shall:

(1) provide guidance to Federal agencies on criteria for identifying disproportionately high and adverse human health or environmental effects on minority populations and low-income populations;

(2) coordinate with, provide guidance to, and serve as a clearinghouse for, each Federal agency as it develops an environmental justice strategy as required by section 1-103 of this order, in order to ensure that the administration, interpretation and enforcement of programs, activities and policies are undertaken in a consistent manner;

(3) assist in coordinating research by, and stimulating cooperation among, the Environmental Protection Agency, the Department of Health and Human Services, the Department of Housing and Urban Development, and other agencies conducting research or other activities in accordance with section 3-3 of this order;

(4) assist in coordinating data collection, required by this order;

(5) examine existing data and studies on environmental justice;

(6) hold public meetings at required in section 5-502(d) of this order; and

(7) develop interagency model projects on environmental justice that

evidence cooperation among Federal agencies.

1-103. Development of Agency Strategies.

(a) Except as provided in section 6-605 of this order, each Federal agency shall develop an agency-wide environmental justice strategy, as set forth in subsections (b) - (e) of this section that identifies and addresses disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The environmental justice strategy shall list programs, policies, planning and public participation processes, enforcement, and/or rulemakings related to human health or the environment that should be revised to, at a minimum:

(1) promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations;

(2) ensure greater public participation;

(3) improve research and data collection relating to the health of and environment of minority populations and low-income populations; and

(4) identify differential patterns of consumption of natural resources among minority populations and low-income populations. In addition, the environmental justice strategy shall include, where appropriate, a timetable for undertaking identified revisions and consideration of economic and social implications of the revisions.

(b) Within 4 months of the date of this order, each Federal agency shall identify an internal administrative process for developing its environmental justice strategy, and shall inform the Working Group of the process.

(c) Within 6 months of the date of this order, each Federal agency shall provide the Working Group with an outline of its proposed environmental justice strategy.

(d) Within 10 months of the date of this order, each Federal agency shall provide the Working Group with its proposed environmental justice strategy.

(e) Within 12 months of the date of this order, each Federal agency shall finalize its environmental justice strategy and provide a copy and written description of its strategy to the Working Group. During the 12 month period from the date of this order, each Federal agency, as part of its environmental justice strategy, shell identify several specific projects that can be promptly undertaken to address particular concerns identified during the development of the proposed environmental justice strategy, and a schedule for implementing those projects.

(f) Within 24 months of the date of this order, each Federal agency shall report to the Working Group on its progress in implementing its agency-wide environmental justice strategy.

(g) Federal agencies shall provide additional periodic reports to the Working Group as requested by the Working Group.

1-104. Reports to The President. Within 14 months of the date of this order, the Working Group shall submit to the President, through the Office of the Deputy Assistant to the President for Environmental Policy and the Office of the Assistant to the President for Domestic Policy, a report that describes the implementation of this order, and includes the final environmental justice strategies described in section 1-103(e) of this order.

Section 2-2. Federal Agency Responsibilities For Federal Programs.

Each Federal agency shall conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such, programs, policies, and activities, because of their race, Color, or national origin.

Section 3-3. Research, Data Collection, and Analysis

3-301. Human Health and Environmental Research and Analysis.

(a) Environmental human health research, whenever practicable and appropriate, shall include diverse segments of the population in epidemiological and clinical studies, including segments at high risk from environmental hazards, such as minority populations, low-income populations and workers who may be exposed to, substantial environmental hazards.

(b) Environmental human health analyses, whenever practicable and appropriate, shall identify multiple and cumulative exposures.

(c) Federal agencies shall provide minority populations and low-income populations the opportunity to comment on the development and design of research strategies undertaken pursuant to this order.

3-302. Human Health and Environmental Data Collection and Analysis To the extent permitted by existing law, including the Privacy Act, as amended (5 U.S.C. section 552a):

(a) each federal agency, whenever practicable and appropriate, shall collect, maintain, and analyze information assessing and comparing environmental and human health risks borne by populations identified by race, national origin, or income. To the extent practical and appropriate, Federal agencies shall use this information to determine whether their programs, policies, and activities have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations;

(b) In connection with the development and implementation of agency strategies in section 1-103 of this order, each Federal agency, whenever practicable and appropriate, shall collect, maintain and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding facilities or sites expected to have substantial environmental, human health, or economic effect on the surrounding populations, when such facilities or sites become the subject of a substantial Federal environmental administrative or judicial action. Such information shall be made available to the public unless prohibited by law; and

(c) Each Federal agency, whenever practicable and appropriate, shall collect, maintain, and analyze information on the race, national origin, income level, and other readily accessible and appropriate information for areas surrounding Federal facilities that are: (1) subject to the reporting requirements under the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. section 11001-11050 as mandated in Executive Order No. 12856; and (2) expected to have a substantial environmental, human health, or economic effect on surrounding populations. Such information shall be made available to the public unless prohibited by law.

(d) In carrying out the responsibilities in this section, each Federal agency, whenever practicable and appropriate, shall share information and eliminate unnecessary duplication of efforts through the use of existing data systems and cooperative agreements among Federal agencies and with State, local, and tribal governments.

Section 4-4. Subsistence Consumption Of Fish And Wildlife.

4-401. Consumption Patterns. Inorder to assist in identifying the need for ensuring protection of populations with differential patterns of subsistence consumption of fish and wildlife, Federal agencies, whenever practicable and appropriate, shall collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. Federal agencies shall communicate to the public the risks of those consumption patterns.

4-402. Guidance. Federal agencies, whenever practicable and appropriate, shall work in a coordinated manner to publish guidance reflecting the latest scientific information available concerning methods for evaluating the human health risks associated with the consumption of pollutant-bearing fish or wildlife. Agencies shall consider such guidance in developing their policies and rules.

Section 5-5. Public Participation and Access to Information

(a) The public may submit recommendations to Federal agencies relating to the incorporation of environmental justice principles into Federal agency programs or policies. Each Federal agency shall convey such recommendations to the Working Group.

(b) Each Federal agency may, whenever practicable and appropriate, translate crucial public documents, notices, and hearings relating to human health or the environment for limited English speaking populations.

(c) Each Federal agency shall work to ensure that public documents, notices, and hearings relating to human health or the environment are concise, understandable, and readily accessible to the public.

(d) The Working Group shall hold public meetings, as appropriate, for the purpose of fact-finding, receiving public comments, and conducting inquiries concerning environmental justice. The Working Group shall prepare for public review a summary of the comments and recommendations discussed at the public meetings.

Section 6-6. General Provisions.

6-601. Responsibility for Agency Implementation. The head of each Federal agency shall be responsible for ensuring compliance with this order. Each Federal agency shall conduct internal reviews and take such other steps as may be necessary to monitor compliance with this order.

6-602. Executive Order No. 12250. This Executive order is intended to supplement but not supersede Executive Order No. 12250, which requires consistent and effective implementation of various laws prohibiting discriminatory practices in programs receiving Federal financial assistance. Nothing herein shall limit the effect or mandate of Executive Order No. 12250.

6-6O3. Executive Order No. 12875. This Executive order is not intended to limit the effect or mandate of Executive Order No. 12875.

6-604. Scope. For purposes of this order, Federal agency means any agency on the Working Group, and such other agencies as may be designated by the President, that conducts any Federal program or activity that substantially affects human health or the environment. Independent agencies are requested to comply with the provisions of this order.

6-605. Petitions far Exemptions. The head of a Federal agency may petition the President for an exemption from the requirements of this order on the grounds that all or some of the petitioning agency's programs or activities should not be subject to the requirements of this order.

6-606. Native American Programs. Each Federal agency responsibility set forth under this order shall apply equally to Native American programs. In addition the Department of the Interior, in coordination with the Working Group, and, after consultation with tribal leaders, shall coordinate steps to be taken pursuant to this order that address Federally-recognized Indian

Tribes.

6-607. Costs. Unless otherwise provided by law, Federal agencies shall assume the financial costs of complying with this order.

6-608. General. Federal agencies shall implement this order consistent with, and to the extent permitted by, existing law.

6-609. Judicial Review. This order is intended only to improve the internal management of the executive branch and is not intended to, nor does it create any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies, its officers, or any person. This order shall not be construed to create any right to judicial review involving the compliance or noncompliance of the United States, its agencies, its officers, or any other person with this order.

William J. Clinton
THE WHITE HOUSE,
February 11, 1994

E.3 EXECUTIVE ORDER 13045 - PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS

On 21 April 1997, President Clinton issued Executive Order 13045, Protection of Children From Environmental Health Risks and Safety Risks. This Executive Order recognizes that a growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health and safety risks, due in part to a child's size and still maturing bodily systems. To remedy this problem, this Executive Order requires Federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks which may disproportionately affect children. The Order further requires Federal agencies to ensure that its policies, programs, activities, and standards address these disproportionate risks. The Order defines environmental health and safety risks as “risks to health or the safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breath, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to).

Text from Executive Order 13045 has been reproduced below.

EXECUTIVE ORDER 13045

PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Section I. Policy.

1-101. A growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks. These risks arise because: children's neurological, imrnunological, digestive, and other bodily systems are still developing; children eat more food, drink more fluids, and breathe more air in proportion to their body weight than adults; children's size and weight may diminish their protection from standard safety features; and children's behavior patterns may make them more susceptible to accidents because they are less able to protect themselves. Therefore, to the extent permitted by law and appropriate, and consistent with the agency's mission, each Federal agency:
(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and
(b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

1-102. Each independent regulatory agency is encouraged to participate in the implementation of this order and comply with its provisions.

Section 2. Definitions.

The following definitions shall apply to this order.

2-201. "Federal agency" means any authority of the United States that is an agency under 44 U.S.C. 3502(1) other than those considered to be independent regulatory agencies under 44 U.S.C. 3502(5). For purposes of this order, "military departments, "as defined in 5 U.S.C 102, are covered under the auspices of the Department of Defense.

2-202. "Covered regulatory action" means any substantive action in a rulemaking, initiated after the date of this order or for which a Notice of Proposed Rulemaking is published 1 year after the date of this order, that is likely to result in a rule that may:

(a) be "economically significant" under Executive Order 12866 (a rulemaking that has an annual effect on the economy of $100 million or more or would adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities); and

(b) concern an environmental health risk or safety risk that an agency has reason to believe may disproportionately affect children.

2-203. "Environmental health risks and safety risks" mean risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or incest (such as the air we breath, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to).

Section 3. Task Force on Environmental Health Risks and Safety Risks to Children.

3-301. There is hereby established the Task Force on Environmental Health Risks and Safety Risks to Children ("Task Force").

3-302. The Task Force will report to the President in consultation with the Domestic Policy Council, the National Science and Technology Council, the Council on Environmental Quality, and the Office of Management and Budget (OMB).

3-303. Membership. The Task Force shall be composed of the:

(a) Secretary of Health and Human Services, who shall serve as a Co-Chair of the Council;
(b) Administrator of the Environmental Protection Agency, who shall serve as a Co-Chair of the Council;
(c) Secretary of Education;
(d) Secretary of Labor;
(e) Attorney General;
(f) Secretary of Energy;
(g) Secretary of Housing and Urban Development;
(h) Secretary of Agriculture;
(i) Secretary of Transportation;
(j) Director of the Office of Management and Budget,
(k) Chair of the Council on Environmental Quality;
(l) Chair of the Consumer Product Safety Commission;
(m) Assistant to the President for Economic Policy;
(n) Assistant to the President for Domestic Policy;
(o) Assistant to the President and Director of the office of Science and Technology Policy;
(p) Chair of the Council of Economic Advisers; and
(q) Such other officials of executive departments and agencies as the President may, from time to time, designate.

Members of the Task Force may delegate their responsibilities under this order to subordinates.

3-304. Functions. The Task Force shall recommend to the President Federal strategies for children's environmental health and safety, within the limits of the Administration's

budget' to include the following elements:

(a) statements of principles, general policy, and targeted annual priorities to guide the Federal approach to achieving the goals of this order;

(b) a coordinated research agenda for the Federal Government, including steps to implement the review of research databases described in section 4 of this order:

(c) recommendations for appropriate partnerships among Federal, State, local, and tribal governments and the private, academic, and nonprofit sectors;

(d) proposals to enhance public outreach and communication to assist families in evaluating risks to children and in making informed consumer choices;

(e) an identification of high-priority initiatives that the Federal Government has undertaken or will undertake in advancing protection of children's environmental health and safety; and

(i) a statement regarding the desirability of new legislation to fulfill or promote the purposes of this order.

3-305. The Task Force shall prepare a biennial report on research, data, or other information that would enhance our ability to understand, analyze, and respond to environmental health risks and safety risks to children. For purposes of this report, cabinet agencies and other agencies identified by the Task Force shall identify and specifically describe for the Task Force key data needs related to environmental health risks and safety risks to children that have arisen in the course of the agency's programs and activities.

The Task Force shall incorporate agency submissions into its report and ensure that this report is publicly available and widely disseminated. The Office of Science and Technology Policy and the National Science and Technology Council shall ensure that this report is fully considered in establishing research priorities.

3-306. The Task Force shall exist for a period of 4 years from the first meeting. At least 6 months prior to the expiration of that period, the member agencies shall assess the need for continuation of the Task Force or its functions, and make appropriate recommendations to the President.

Section 4. Research Coordination and Integration.

4-401. Within 6 months of the date of this order, the Task Force shall develop or direct to be developed a review of existing and planned data resources and a proposed plan for ensuring that researchers and Federal research agencies have access to information on all research conducted or funded by the Federal Government that is related to adverse health risks in children resulting from exposure to environmental health risks or safety risks. The National Science and Technology Council shall review the plan.

4-402. The plan shall promote the sharing of information on academic and private research. It shall include recommendations to encourage that such data, to the extent permitted by law, is available to the public, the scientific and academic communities, and all Federal agencies.

Section 5. Agency Environmental Health Risk or Safety Risk Regulations.

5-501. For each covered regulatory action submitted to OMB's Office of Information and Regulatory Affairs (OIRA) for review pursuant to Executive Order 12866, the issuing agency shall provide to OIRA the following information developed as part of the agency, s decision making process' unless prohibited by law:

(a) an evaluation of the environmental health or safety effects of the planned regulation on children; and

(b) an explanation of why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the agency.

5-502. In emergency situations, or when an agency is obligated by law to act more quickly than normal review procedures allow, the agency shall comply with the provisions of this section to the extent practicable. For those covered regulatory actions that are governed by a court-imposed or statutory deadline, the agency shall, to the extent practicable, schedule any rulemaking proceedings so as to permit sufficient time for completing the analysis required by this section.

5-503. The analysis required by this section may be included as part of any other required analysis, and shall be made part of the administrative record for the covered regulatory action or otherwise made available to the public, to the extent permitted by law.

Section 6. Interagency Forum on Child and Family Statistics.

6-601. The Director of the OMB ("Director") shall convene an Interagency Forum on Child and Family Statistics ("Forum"), which will include representatives from the appropriate Federal statistics and research agencies. The Forum shall produce an annual compendium ("Report") of the most important indicators of the well-being of the Nation's children.

6-602. The Forum shall determine the indicators to be included in each Report and identify the sources of data to be used for each indicator. The Forum shall provide an ongoing review of Federal collection and dissemination of data on children and families, and shall make recommendations to improve the coverage and coordination of data collection and to reduce duplication and overlap.

6-603. The Report shall be published by the Forum in collaboration with the National Institute of Child Health and Human Development. The Forum shall present the first annual Report to the President, through the Director, by July 31, 1997. The Report shall be submitted annually thereafter, using the most recently available data.

Section 7 General Provisions.

7-701. This order is intended only for internal management of the executive branch. This order is not intended, and should not be construed to create, any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity by a party against the United States, its agencies, its officers, or its employees. This order shall not be construed to create any right to judicial review involving the compliance or noncompliance with this order by the United States, its agencies, its officers, or any other person.

7-702. Executive Order 12606 of September 2, 1987 is revoked.

WILLIAM J. CLINTON
THE WHITE HOUSE
April 21, 1997

Air Quality Supporting Documentation

G.1 INTRODUCTION

This appendix has been prepared to provide pertinent information and supporting documentation that is used for the air quality analysis. This document is not a report, it merely provides reference documentation for the EIS. This appendix contains the following sections:

- Proposed Changes to National Ambient Air Quality Standards
- Calculations for Mobile Source Emissions
- Calculations for Fugitive PM-10 Emissions from Construction Activities
- Calculations for Construction Equipment Emissions
- Calculations for Prescribed Burning Emissions Reduction

G.2 PROPOSED CHANGES TO NATIONAL AMBIENT AIR QUALITY STANDARDS

On July 16, 1997, President Clinton approved the issuance of new air quality standards designed to improve the lives of Americans. A copy of the President's memorandum and the Implementation Plan for Revised Air Quality Standards has been reporduced below.

THE WHITE HOUSE
WASHINGTON
July 16, 1997

MEMORANDUM FOR THE ADMINISTRATOR OF THE ENVIRONMENTAL PROTECTION AGENCY

SUBJECT: Implementation of Revised Air Quality Standards for Ozone and Particulate Matter

I have approved the issuance of new air quality standards to provide important new health protection for all Americans by further controlling pollution from ozone and particulate matter. These new standards promise to improve the lives of millions of Americans in coming years.

Consistent with my Administration's approach to regulatory decision making, I also want to ensure that these new standards are implemented in a common sense, cost-effective manner. It is critically important that these standards be implemented in the most flexible, reasonable, and least burdensome manner, and that the Federal Government work with State and local governments and other interested parties to this end.

I have determined that there are certain essential elements of an approach to implementation that will accomplish these goals. I direct you to use the following elements when implementing the new air quality standards:

1. Implementation of the air quality standards is to be carried out to maximize common sense, flexibility, and cost effectiveness;

2. Implementation shall ensure that the Nation continues its progress toward cleaner air by respecting the agreements already made by States, communities, and businesses to clean up the air, and by avoiding additional burdens with respect to the beneficial measures already underway in many areas. Implementation also shall be structured to reward State and local governments that take early action to provide clean air to their residents; and to respond to the fact that pollution travels hundreds of miles and crosses many State lines;

3. Implementation shall ensure that the Environmental Protection Agency ("Agency") completes its next periodic review of particulate matter, including review by the Clean Air Scientific Advisory Committee, within 5 years of issuance of the new standards, as contemplated by the Clean Air Act. Thus, by July 2002, the Agency will have determined, based on data available from its review, whether to revise or maintain the standards. This determination will have been made before any areas have been designated as "nonattainment" under the $PM_{2.5}$ standards and before imposition of any new controls related to the $PM_{2.5}$ standards; and

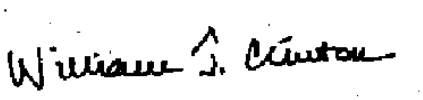
4. Implementation is to be accomplished with the minimum amount of paperwork and shall seek to reduce current paperwork requirements wherever possible.

Excellent preliminary work on the strategy for carrying out these implementation principles has been accomplished by an interagency Administration group and I commend that group for these important efforts. The group's work is set out in the attached plan, which is hereby incorporated by reference.

In order for the implementation of these standards to proceed in accordance with the goals I have established, I hereby direct you, in consultation with all affected agencies and parties, to undertake the steps appropriate under law to carry out the attached plan and to complete all necessary guidance and rulemaking no later than December 31, 1998.

This memorandum is for the purposes of internal Administration management only, and is not judicially reviewable.

You are authorized and directed to publish this determination and plan in the Federal Register.



Implementation Plan for Revised Air Quality Standards

An interagency Administration group has discussed and evaluated approaches for the common sense, flexible, and cost effective implementation of the revised National Ambient Air Quality Standards (NAAQS) for ozone and particulate matter (PM). This document reflects the preliminary work by that group on a strategy for implementing these health-based standards consistent with the principles discussed by President Clinton in his announcement of the standards. The Environmental Protection Agency (EPA) will continue to work with other Federal agencies, State and local governments, small businesses, industry, and environmental and public health groups to fully develop and implement this strategy.

This implementation plan provides a road map for areas to attain the standards and protect public health without sacrificing economic growth. The goals of the plan are to: 1) maintain the progress currently being made toward cleaner air and respect the agreements and technological progress already made by communities and businesses to pursue clean air; 2) reward State and

local governments and businesses that take early action to reduce air pollution levels through cost-effective approaches; 3) respond to the fact that pollution can travel hundreds of miles and cross many State lines; 4) work with the States to develop control programs which employ regulatory flexibility to minimize economic impacts on businesses large and small to the greatest possible degree consistent with public health protection; 5) minimize planning and regulatory burdens for State and local governments and businesses where air quality problems are regional, not local, in nature; 6) ensure that air quality planning and related Federal, State, and local planning are coordinated; and 7) recognize the substantial lead time necessary for State and local governments and businesses to plan for and meet standards for a new indicator of PM.

The Clean Air Act (CAA) requires the EPA to set air quality standards to protect the public health and the environment without consideration of costs. The 1997 revisions to the NAAQS for ground level ozone and PM fulfill this requirement. However, the Act recognizes that the EPA and the States must work together to develop cost-effective, flexible, and fair implementation plans if the standards are to be met as expeditiously as practicable.

There are a number of important linkages between these pollutants. There is also a linkage between these pollutants and their precursors and regional haze problems. Promulgation of the two standards simultaneously provides a more complete description of the health and environmental effects associated with two of the major components of air pollution. It can help States and local areas better manage their air quality by focusing on the common precursors of both pollutants and provides the opportunity to work jointly with industry to address common sources of multiple air pollutants in a comprehensive manner. This will lead to more effective and efficient protection of public health and the environment.

In addition to the interagency process, the EPA has been soliciting other input. While the review of the ozone and PM NAAQS was underway, the EPA convened a group of air quality experts representing industry, environmental, and public health groups; State and local governments; other Federal agencies; and academia under the Federal Advisory Committee Act (FACA). This group was charged by the Administrator of the EPA to develop innovative, flexible, and cost-effective implementation strategies that utilize a mix of control measures to address ozone, PM, and regional haze. This group will continue working with the EPA to further develop this strategy.

In addition, all Federal agencies will continue to do their part in carrying out the Federal responsibilities in the State/Federal partnership that has been so successful in improving air quality in the United States. In addition, the EPA, in partnership with the other Federal agencies, has developed an interagency research program that is described in Appendix 1 for the coordination of future research on both ground level ozone and PM.

Implementation of Ozone Standard

Phase-out of 1-hour standard

The revised ozone standard is intended to replace the current 1-hour standard with an 8-hour standard. However, the 1-hour standard will continue to apply to areas not attaining it for an interim period to ensure an effective transition to the new 8-hour standard.

Subpart 2 of part D of Title I of the CAA addresses the requirements for different classifications of nonattainment areas that do not meet the current 1-hour standard (i.e., marginal, moderate, serious, and severe). These requirements include such items as mandatory control measures, annual rate of progress requirements for emission reductions, and offset ratios for the emissions from new or modified stationary sources. These requirements have contributed significantly to the improvements in air quality since 1990. Although the EPA initially offered an interpretation of the CAA in the proposed Interim Implementation Policy (IIP) (61 FR 65764, December 13, 1996) under which the provisions of Subpart 2 would not apply to existing ozone nonattainment areas once a new ozone NAAQS is promulgated, the EPA has reconsidered that interpretation after receiving comments on the proposed IIP. Based on EPA's legal review, the Agency has concluded that Subpart 2 should continue to apply as a matter of law for the purpose of achieving attainment of the current 1-hour standard. Once an area attains the 1-hour standard, those provisions will no longer apply and the area's implementation of the new 8-hour standard

would be governed only by the provisions of Subpart 1 of Part D of Title I.

To streamline the process and minimize the burden on existing nonattainment areas, the 1-hour standard will cease to apply to an area upon a determination by the EPA that an area has attained air quality that meets the 1-hour standard. In light of the implementation of the new 8-hour standard, which is more stringent than the existing 1-hour standard, States will not have to prepare maintenance plans for those areas that attain the 1-hour standard. Within 90 days, the EPA will publish an action identifying existing nonattainment areas and maintenance areas to which the 1-hour standard will cease to apply because they have attained the 1-hour standard.

For areas where the air quality does not currently attain the 1-hour standard, the 1-hour standard will continue in effect. The provisions of Subpart 2 would also apply to designated nonattainment areas until such time as each area has air quality meeting the 1-hour standard. At that time, the EPA will take action so that the 1-hour standard no longer applies to such areas. In any event, the "bump-up" provisions of Subpart 2, which require areas not attaining the standard by the applicable attainment date to be reclassified to the next higher classification, will not be triggered by the failure of any area to meet the new 8-hour standard. The purpose of retaining the current standard is to ensure a smooth legal and practical transition to the new standard.

Implementation of New 8-hour Ozone standard

This section discusses the general timeline for implementing the 8-hour standard, the importance of regional approaches to address ozone and options for classifying and designating areas relative to the 8-hour ozone NAAQS.

General Timeline

Following promulgation of a revised NAAQS, the Clean Air Act provides up to 3 years for State governors to recommend and the EPA to designate areas according to their most recent air quality. In addition, States will have up to 3 years from designation to develop and submit State Implementation Plans (SIPs) to provide for attainment of the new standard. Under this approach, areas would be designated as nonattainment for the 8-hour standard by 2000 and would submit their nonattainment SIPs by 2003. The Act allows up to 10 years plus two 1-year extensions from the date of designation for areas to attain the revised NAAQS.

Regional Strategy

Ozone is a pollutant that travels great distances and it is increasingly clear that it must be addressed as a regional problem. For the past 2 years the EPA has been working with the 37 most eastern States through the Ozone Transport Assessment Group (OTAG) in the belief that reducing interstate pollution will help all areas in the OTAG region attain the NAAQS. A regional approach can reduce compliance costs and allow many areas to avoid most traditional nonattainment planning requirements. The OTAG was sponsored by the Environmental Council of States, with the objective of evaluating ozone transport and recommending strategies for mitigating interstate pollution. The OTAG completed its work in June 1997 and forwarded recommendations to the EPA. Based on these recommendations, in September 1997, the EPA will propose a rule requiring States in the OTAG region that are significantly contributing to nonattainment or interfering with maintenance of attainment in downwind States to submit SIPs to reduce their interstate pollution. The EPA will issue the final rule by September 1998.

If the States choose to establish a regional emission cap-and-trade system, modeled on the current acid rain program, reductions can be obtained at a lower cost. The EPA will encourage and assist the States to develop and implement such a program. Most important, based on the EPA's review of the latest modeling, a regional approach, coupled with the implementation of other already existing State and Federal Clean Air Act requirements, will allow the vast majority of areas that currently meet the 1-hour standard but would not otherwise meet the new 8-hour standard to achieve healthful air quality without additional local controls.

Areas in the OTAG region that would exceed the new standard after the adoption of the regional strategy, including areas that do not meet the current 1-hour standard, will benefit as well because the regional NO_x program will reduce the extent of additional local measures needed to

achieve the 8-hour standard. In many cases these regional reductions may be adequate to meet CAA progress requirements for a number of years, allowing areas to defer additional local controls.

Transitional Classification

For areas that attain the 1-hour standard but not the new 8-hour standard, the EPA will follow a flexible implementation approach that encourages cleaner air sooner, responds to the fact that ozone is a regional as well as local problem, and eliminates unnecessary planning and regulatory burdens for State and local governments. A primary element of the plan will be the establishment under Section 172(a)(1) of the CAA of a special "transitional" classification for areas that participate in a regional strategy and/or that opt to submit early plans addressing the new 8-hour standard. Because many areas will need little or no additional new local emission reductions to reach attainment, beyond those reductions that will be achieved through the regional control strategy, and will come into attainment earlier than otherwise required, the EPA will exercise its discretion under the law to eliminate unnecessary local planning requirements for such areas. The EPA will revise its rules for new source review (NSR) and conformity so that States will be able to comply with only minor revisions to their existing programs in areas classified as transitional. During this rulemaking, the EPA will also reexamine the NSR requirements applicable to existing nonattainment areas, in order to deal with issues of fairness among existing and new nonattainment areas. The transitional classification will be available for any area attaining the 1-hour standard but not attaining the 8-hour standard as of the time the EPA promulgates designations for the 8-hour standard. Areas will follow the approaches described below based on their status.

(1) Areas attaining the 1-hour standard, but not attaining the 8-hour standard, that would attain the 8-hour standard through the implementation of the regional NO_x transport strategy for the East.

Based on the OTAG analyses, areas in the OTAG region that can reach attainment through implementation of the regional transport strategy would not be required to adopt and implement additional local measures. When the EPA designates these areas under section 107(d), it will place them in the new transitional classification if they would attain the standard through implementation of the regional transport strategy and are in a State that by 2000 submits an implementation plan that includes control measures to achieve the emission reductions required by the EPA's rule for States in the OTAG region. This is 3 years earlier than an attainment SIP would otherwise be required. The EPA anticipates that it will be able to determine whether such areas will attain based on the OTAG and other regional modeling and that no additional local modeling would be required.

(2) Areas attaining the 1-hour standard but not attaining the 8-hour standard for which a regional transport strategy is not sufficient for attainment of the 8-hour standard.

To encourage early planning and attainment for the 8-hour standard, the EPA will make the transitional classification available to areas not attaining the 8-hour standard that will need additional local measures beyond the regional transport strategy, as well as to areas that are not affected by the regional transport strategy, provided they meet certain criteria. To receive the transitional classification, these areas must submit an attainment SIP prior to the designation and classification process in 2000. The SIP must demonstrate attainment of the 8-hour standard and provide for the implementation of the necessary emissions reductions on the same time schedule as the regional transport reductions. The EPA will work with affected areas to develop a streamlined attainment demonstration. By submitting these attainment plans earlier than would have otherwise been required, these areas would be eligible for the transitional classification and its benefits and would achieve cleaner air much sooner than otherwise required.

(3) Areas not attaining the 1-hour standard and not attaining the 8-hour standard

The majority of areas not attaining the 1-hour standard have made substantial progress in evaluating their air quality problems and developing plans to reduce emissions of ozone-causing pollutants. These areas will be eligible for the transitional classification provided that they attain the 1-hour standard by the year 2000 and comply with the appropriate provisions of section (1) or (2) above depending upon which conditions they meet.

Areas not Eligible for the Transitional Classification

For these areas, their work on planning and control programs to meet the 1-hour standard by their current attainment date (e.g., 2005 for Philadelphia and 2007 for Chicago) will take them a long way toward meeting the 8-hour standard. While the additional local reductions that they will need to achieve the 8-hour standard must occur prior to their 8-hour attainment date (e.g., 2010), for virtually all areas the additional reductions needed to achieve the 8-hour standard can occur after the 1-hour attainment date. This approach allows them to make continued progress toward attaining the 8-hour standard throughout the entire period without requiring new additional local controls for attaining the 8-hour standard until the 1-hour standard is attained. These areas, however, will need to submit an implementation plan within 3 years of designation as nonattainment for the new standard for achieving the 8-hour standard. Such a plan can rely in large part on measures needed to attain the 1-hour standard. For virtually all of these areas, no additional local control measures beyond those needed to meet the requirements of Subpart 2 and needed in response to the regional transport strategy would be required to be implemented prior to their applicable attainment date for the 1-hour standard. Nonattainment areas that do not attain the 1-hour standard by their attainment date would continue to make progress in accordance with the requirements of Subpart 2; the control measures needed to meet the progress requirements under Subpart 2 would generally be sufficient for meeting the control measure and progress requirements of Subpart 1 as well.

Implementation of Particulate Matter Standards

As required under the Act, within the next 5 years the EPA will complete the next periodic review of the PM criteria and standards, including review by the CASAC. As with all NAAQS reviews, the purpose is to update the pertinent scientific and technical information and to determine whether it is appropriate to revise the standards in order to protect the public health with an adequate margin of safety or to protect the public welfare. Although the EPA has concluded that the current scientific knowledge provides a strong basis for the revised PM_{10} and new $PM_{2.5}$ standards, there remain scientific uncertainties associated with the health and environmental effects of PM and the means of reducing them.

The following steps discussed below and in Appendix 1, Interagency Research Program, will address these concerns. First, recognizing the importance of developing a better understanding of the effects of fine particles on human health, including their causes and mechanisms, as well as the species and sources of $PM_{2.5}$, the EPA will continue to sponsor research, particularly in these areas. Second, the Administrator of the EPA will promptly initiate a new review of the scientific criteria on the effects of airborne particles on human health and the environment. Within 90 days, the EPA will develop and provide to CASAC a plan and proposed schedule for this review to assure that the review is completed within 5 years. The plan and schedule will be published in the **Federal Register**. Thus, by July 2002, the Agency will have determined, based on data available from its review, whether to revise or maintain the standards. This determination will have been made before any areas have been designated nonattainment under the $PM_{2.5}$ standards, and before imposition of any new controls related to the $PM_{2.5}$ standards.

Implementation of New $PM_{2.5}$ NAAQS

As set forth in the EPA's final action regarding PM, the EPA is establishing a new indicator for fine particles (i.e., $PM_{2.5}$) and promulgating new $PM_{2.5}$ standards. Monitoring and planning will be required before control measures to address these standards would be required. Therefore, the first priority for implementing them is establishment of a comprehensive monitoring network to determine ambient fine particle concentrations across the country. The monitoring network will help the EPA and the States determine which areas do not meet the new air quality standards, what are the major source of $PM_{2.5}$ in various regions, and what action is needed to clean up the air. The EPA and the States will consult with affected stakeholders on the design of the network and will then establish the network, which will consist of approximately 1,500 monitors. All monitors will provide for limited speciation, or analysis of the chemical composition, of the particles measured. At least 50 of the monitors will provide for a more comprehensive speciation of the particles. The EPA will work with States to deploy the $PM_{2.5}$ monitoring network. Based on the ambient monitoring data we have seen to date, these would generally not include agricultural areas. The EPA will fund the cost of purchasing the monitors, as well as the cost of analyzing particles collected at the monitors to determine their chemical composition.

Because the EPA is establishing standards for a new indicator for PM (i.e., $PM_{2.5}$), it is critical to develop the best information possible before attainment and nonattainment designation decisions are made. Three calendar years of Federal reference method monitoring data will be used to determine whether areas meet or do not meet the $PM_{2.5}$ standards. Three years of data will be available from the earliest monitors in the spring of 2001, and 3 years of data will be available from all monitors in 2004. Following this monitoring schedule and allowing time for data analysis, Governors and the EPA will not be able to make the first determinations as to which areas should be designated nonattainment until at least 2002, 5 years from now. The Clean Air Act, however, requires that the EPA make designation determinations (i.e., attainment, nonattainment, or unclassifiable) within 2 to 3 years of revising a NAAQS. To fulfill this requirement, in 1999 the EPA will issue "unclassifiable" designations for $PM_{2.5}$. These designations will not trigger the planning or control requirements of part D of Title I of the Act.

When the EPA designates $PM_{2.5}$ nonattainment areas pursuant to the Governors' recommendations beginning in 2002, areas will be allowed 3 years to develop and submit to the EPA pollution control plans showing how they will meet the new standards. Areas will then have up to 10 years from their redesignation to nonattainment to attain the $PM_{2.5}$ standards with the possibility of two 1-year extensions.

In developing strategies for attaining the $PM_{2.5}$ standards, it is important to focus on measures that decrease emissions that contribute to regional pollution. Available information indicates that nearly one-third of the areas projected not to meet the new $PM_{2.5}$ standards, primarily in the Eastern United States, could come into compliance as a result of the regional SO_2 emission reductions already mandated under the Clean Air Act's acid rain program, which will be fully implemented between 2000 and 2010. Similarly, the Grand Canyon Visibility Transport Commission, consisting of Western States and tribes, committed to reducing regional emissions of $PM_{2.5}$ precursors (sulfates, nitrates, and organics) to improve visibility across the Colorado Plateau.

As detailed $PM_{2.5}$ air quality data and data on the chemical composition of $PM_{2.5}$ in different areas become available, the EPA will work with the States to analyze regional strategies that could reduce $PM_{2.5}$ levels. If further cost-effective regional reductions will help areas meet the new standard, the EPA will encourage States to work together to use a cap-and-trade approach similar to that used to curb acid rain. This acid rain program delivered environmental benefits at a greatly reduced cost.

Given the regional dimensions of the $PM_{2.5}$ problem, local governments and local businesses should not be required to undertake unnecessary planning and local regulatory measures when the problem requires action on a regional basis. Therefore, as long as the States are doing their part to carry out regional reduction programs, the areas that would attain the $PM_{2.5}$ standards based on full implementation of the acid rain program would not face new local requirements. Early identification of other regional strategies could also assist local areas in completing their programs to attain the $PM_{2.5}$ standards after those areas have been designated nonattainment.

The EPA will also encourage States to coordinate their $PM_{2.5}$ control strategy development and efforts to protect regional visibility. Visibility monitoring and data analysis will support both $PM_{2.5}$ implementation and the visibility program.

Implementation of Revised PM_{10} NAAQS

In its rule, the EPA is revising the current set of PM_{10} standards. Given that health effects from coarse particles are still of concern, the overall goal during this transition period is to ensure that PM_{10} control measures remain in place to maintain the progress that has been achieved toward attainment of the current PM_{10} NAAQS (and which provides benefits for $PM_{2.5}$) and protection of public health.

To ensure that this goal is met, the existing PM_{10} NAAQS will continue to apply until certain critical actions by the EPA, and by States and local agencies, have been taken to sustain the progress already made. For areas not attaining the existing PM_{10} NAAQS when the revised standards go into effect, those standards remain in effect until the EPA has completed a section 172(e) rulemaking to prevent backsliding. The EPA will propose this rulemaking in the Fall of 1997. For areas attaining the existing PM_{10} NAAQS, the EPA will retain the existing PM_{10} NAAQS until the State submits and the EPA approves the section 110 SIP which States are required to submit within 3 years of a NAAQS revision. Once those areas have an approved SIP, the EPA will take action so the standard no longer applies. In addition, the EPA will take action within 3 years to designate areas for the revised PM_{10} standards.

Cost-Effective Implementation Strategies

There is a strong desire to drive the development of new technologies with the potential of greater emission reduction at less cost. It was agreed that $10,000 per ton of emission reduction is the high end of the range of reasonable cost to impose on sources. Consistent with the State's ultimate responsibility to attain the standards, the EPA will encourage the States to design strategies for attaining the PM and ozone standards that focus on getting low cost reductions and limiting the cost of control to under $10,000 per ton for all sources. Market-based strategies can be used to reduce compliance costs. The EPA will encourage the use of concepts such as a Clean Air Investment Fund, which would allow sources facing control costs higher than $10,000 a ton for any of these pollutants to pay a set annual amount per ton to fund cost-effective emissions reductions from non-traditional and small sources. Compliance strategies like this will likely lower the costs of attaining the standards through more efficient allocation, minimize the regulatory burden for small and large pollution sources, and serve to stimulate technology innovation as well.

Additional Future Activities and Coordination with Other Federal Departments and Agencies

The approaches outlined above for implementation of the current and new ozone standards will be developed in the future in much greater detail. In order to ensure that the final details are practical, incorporate common sense, and provide the appropriate steps toward cleaning the air, input is needed from many stakeholders such as representatives of State and local governments, industry, environmental groups, and Federal agencies. The EPA will continue seeking such advice from a range of stakeholders and, after evaluating their input, propose the necessary guidance to make these approaches work. Moreover, the EPA will continue to work with a number of Federal agencies to ensure that those agencies comply with these new standards in cost-effective, common sense ways. The guidance and rules (e.g., revisions to NSR and conformity) will be completed by the end of 1998.

The EPA will continue to work with the Small Business Administration (SBA) because small businesses are particularly concerned about the potential impact resulting from future control measures to meet the revised PM and ozone standards. The EPA, in partnership with SBA, will work with the States to include in their SIPs flexible regulatory alternatives that minimize the economic impact and paperwork burden on small businesses to the greatest possible degree consistent with public health protection.

The EPA and the Department of Defense will continue to work towards assuring that the CAA's general conformity provisions are applied appropriately so as to maintain the air quality

benefits of this requirement consistent with the Department's goals for cost-saving consolidation of the defense infrastructure and the economic viability for civilian use of former military bases, in support of base realignment and closure activities.

In addition, understanding that critical training using smoke and obscurants must continue to ensure the training and readiness of the military, the EPA will work with the Department of Defense to develop a policy that ensures that a local area will not be redesignated to nonattainment solely on the basis of the use of obscurants or smoke for such purposes. While there is a need to keep the public informed of violations of air quality standards, if any were to occur, there is no need to curtail the training or limit it to certain weather conditions.

The EPA will also work closely with the Department of Agriculture and the Agriculture Air Quality Task Force on any agricultural issues associated with the ozone and PM standards. By establishing new standards for particulate matter smaller than 2.5 micrometers in diameter ($PM_{2.5}$), as opposed to tightening the existing standards for particles smaller than 10 micrometers (PM_{10}), the EPA is actually focusing regulatory attention away from farming and tilling issues. Indeed, soils and agriculture comprise a much smaller portion of the $PM_{2.5}$ problem than they do of the PM_{10} problem. The EPA will issue guidance to the States to ensure that in meeting the $PM_{2.5}$ standards they focus their control strategies on sources of fine particles, rather than coarse particles (those particles larger than $PM_{2.5}$).

Finally, the EPA will continue to work with the interagency group addressing fire and air quality issues. The EPA recognizes the inevitability of fire, and the important role of fire in natural systems. The interagency group will develop policies and practices to assure compatibility between fire and air quality programs consistent with public health, safety, and environmental protection.

APPENDIX 1

Interagency Research Program

The EPA has concluded that the current scientific knowledge provides a strong basis for the revised ozone and PM_{10} standards and the new $PM_{2.5}$ standards. However, for both pollutants there exist uncertainties about the health effects and their causes that can benefit from further study. The complex chemistry of their formation and the potential for the regional transport of their precursor pollutants and ozone and PM also needs to be better understood to design effective control strategies to reduce their concentrations in the ambient air. The research program is structured to prioritize those projects that ensure research activities are focused on high-priority topics and that the research carried out by various agencies is both complementary and timely. The EPA will reach out to form partnerships with the private sector and State and local governments in performing the research wherever possible.

Particulate Matter Research

As discussed elsewhere, the EPA will complete another full scientific and technical review of the PM standards by 2002. Simultaneous with the planning for the current criteria review in 1993, the EPA began a process of increasing emphasis on PM research. As discussed above, commenters on the proposed PM NAAQS also expressed significant concerns about the science. The steps discussed below are intended to address the concerns raised by the commenters.

Based on the recently completed comprehensive scientific review, the EPA is again reassessing its research priorities to address the most recent understanding of these uncertainties with the development of two documents, entitled PM Research Needs for Human Health Risk Assessment and ORD PM Research Program Strategy. These documents are designed to highlight significant health research needs and EPA/ORD's strategy to address a subset of those needs as well as research needs for implementing the standards. Both documents were reviewed by the Clean Air Scientific Advisory Committee (CASAC) in a November 1996 meeting, and are currently undergoing revisions to address CASAC comments.

These documents, in turn, will help to guide an expansion of an ongoing government-wide effort to target and coordinate Federal research on particulate matter. The EPA, in partnership with other

Federal agencies, will develop a greatly expanded coordinated interagency PM research program. The program will contribute to expanding the science associated with particulate matter health effects, as well as developing improved monitoring methods and cost-effective mitigation strategies. For example, the Department of Health and Human Services is conducting research on respiratory disease and could undertake surveillance of PM-related health effects. Significant emphasis will be placed on coordinating research on health effects, biological mechanism causing effects, monitoring, source-receptor relationships, speciation of PM, identification of sources, control technologies and regional transport for particulate matter with corresponding research on ozone and other related pollutants including regional haze. To assist State and local efforts in completing planning requirements and reducing PM, the EPA will work cooperatively with the Department of Agriculture, Department of Defense, Department of Energy, Department of Transportation, and other affected Federal agencies to refine existing, limited analytical models for PM_{10} and to develop new reliable predictive models for $PM_{2.5}$.

Tropospheric (Ground Level) Ozone Research

To ensure that the ozone NAAQS and their implementation continue to be based on the best available science, the EPA will continue its research efforts on tropospheric or ground level ozone. As with the setting and implementation of virtually all health-based environmental standards, there remain scientific uncertainties associated with the effects of ozone and the means of reducing them. The EPA has participated in an inter-governmental public/private partnership called the North American Research Strategy for Tropospheric Ozone (NARSTO) that involves a coordinated effort to identify and address key issues in the emissions, transport, and mitigation of photochemical pollutants. Further, with the completion of the ozone Criteria Document, the EPA has reassessed the uncertainties and research needs on the health and ecological effects of ozone at workshops held in March and May 1997, respectively. The EPA is currently developing a health and ecological effects research needs document for ozone, which will be submitted for review by CASAC.

In addition, the EPA will continue broader efforts to coordinate Federal research on tropospheric ozone. The public/private NARSTO partnership is a model cooperative effort already begun in the area of atmospheric processes and risk management. NARSTO's membership spans government, utilities and other industries, and the academic community -- all following a single national research agenda. The EPA will also work in partnership with other Federal agencies to address research needs on ozone health and ecological effects. For example, the Department of Health and Human Services is conducting research on respiratory disease and could undertake surveillance of ozone-related health effects. These research efforts will be coordinated to ensure research activities are focused on high-priority topics and that the research carried out by various agencies is complementary. Significant emphasis will be placed on coordinating both health effects, monitoring, source-receptor, and control technologies for ozone with corresponding research on particulate matter and other related pollutants subject to significant regional transport.

G.3 CALCULATIONS FOR MOBILE SOURCE EMISSIONS

The first nine pages of this subsection provide information concerning the development of the Mobile Source emission estimates that would occur under the three development alternatives. These results are based upon information that was available on August 14, 1997.

Calculation of Mobile Source Emissions are dependent upon a series of variables and the model applied. The mobile source emission calculations for this EIS were based upon the use of the USEPA's Mobile 5a and Mobile 5b model emission factors. Supporting information that was used in the development of the calculations includes the following:

- Estimated traffic origins and destinations projected for the reuse of Fort McClellan based upon information provided by the FMRRA;

- a five-page Technical Memorandum dated 12 May 1997 that includes seven pages of supporting calculations and climatic data;

- a one-page Technical Memorandum dated 11 August 1997 that provides clarifying information concerning the average vehicle speed used in the Mobile 5a and 5b modeling for Fort McClellan.

G.4 CALCULATIONS FOR FUGITIVE PM-10 EMISSIONS FROM CONSTRUCTION ACTIVITIES

The first page of this subsection provides information concerning fugitive PM-10 emissions that would be anticipated as a result of construction activities. As noted on analysis, these results are based upon information that was available on August 14, 1997 and assumed:

- acres disturbed do not include “Active Recreation or Wetlands/Passive Recreation” areas;
- construction would occur over a 20-year period;
- an average of 230 working days per year would be available to complete construction activities, and that half of those days (155 days total) would be used for site preparation;
- four days of disturbance will occur per acre;
- the emission factor for uncontrolled fugitive dust emissions from ground-disturbing activities will be approximately 1.2 tons per acre per month as delineated in AP-42, Fifth Edition, Section 13.2.3; and that
- PM10 will represent approximately 24 percent of TSP.

Also provided in this subsection is the supporting information used in the development of the various reuse plan multipliers for the three implementation alternatives.

G.5 CALCULATIONS FOR CONSTRUCTION EQUIPMENT EMISSIONS

Specific information describing the project duration, daily hours of operation, or specific usage of heavy construction equipment varies from project to project. For purposes of analysis, the type of construction equipment and the hours of operation anticipated during the proposed construction projects were estimated using industry standard building construction cost estimating methodologies (Means, 1997). The following were used as a basis of analysis.

Assumptions:

1. Disturbed area = total area - active and passive recreation areas for the three proposed plans.

2. Surface topography assumed at 2 percent slope for cut and fill operations (impervious areas only).

3. Site clearing and grading would occur on the entire disturbed area.

4. 10 percent of impervious area less building area would be covered with 4 inch portland cement concrete.

5. 90 percent of impervious area less building area would be covered with 4 inch asphaltic concrete.

6. Emissions from asphalt paving would be from the operation of a hot mix asphalt batching plant. This was assumed because emissions from asphalt batching (either on-post or off-post) would be within the geographic boundary of the Air Quality Control Region.

7. Unit weight of asphalt is estimated as 130 pounds per cubic foot.

8. 60 days would be required for site clean-up.

Combustive emissions from construction equipment exhaust were estimated from USEPA approved emissions factors for heavy-duty diesel-powered construction equipment (USEPA 1985b). The following represents sample calculations for estimating annual carbon monoxide (CO) emissions from bulldozer operations and hot mix asphalt batching plant operations used in MHIR, respectively.

Dozer Operations:

From USEPA, 1985: Table II-7.1; CO emission factor for a heavy-duty diesel powered bulldozer = 1.794 pounds per hour (lbs/hr)

CO Emissions = (1.794 lbs/hr)*(16,472.5 hrs/yr)*(1 ton/2,000 lbs)

CO Emissions = 14.8 tons per year (tpy)

Asphalt Batching Operations:

From USEPA, 1995: Table 11.1-2; CO emission factor for a hot mix asphalt batching plant = 0.34 pounds per ton asphalt (lbs/ton)

CO Emissions = (0.34 lbs/ton)*(535,135 ft3/yr)*(130 lbs/ft3))*(1 ton/2,000 lbs)^2

CO Emissions = 5.91 tpy

The emissions factors used to calculate air pollutant emissions from the operation of heavy-duty diesel-powered construction equipment and a batch mix hot mix asphalt plant are provided below in the following table:

Heavy-Duty Diesel-Powered Construction Equipment
USEPA, 1985: Table II-7.1

Equipment	Emission Factors (pounds per hour)				
	CO	VOC	NO_x	SO_x	PM_{10}
Backhoe	1.794	0.304	1.260	0.137	0.112
Blower	12.100	0.410	0.320	0.017	0.021
Bulldozer	1.257	0.425	3.840	0.463	0.406
Concrete Truck	1.794	0.304	4.166	0.454	0.256
Crane	0.675	0.018	1.691	0.143	0.139
Dump Truck	1.794	0.304	4.166	0.454	0.256
Front-End Loader	0.572	0.291	1.890	0.182	0.172
Paver	0.675	0.183	1.691	0.143	0.139
Roller	0.030	0.083	0.962	0.067	0.050
Scraper	1.257	0.052	0.713	0.086	0.061
Striper	12.100	0.410	0.320	0.017	0.021
18-Wheel Truck	1.794	0.304	4.166	0.454	0.256

Batch Mix Hot Mix Asphalt Plan
USEPA, 1995: Table 11.1-2 and Table 11.1-7

Operation	Emission Factors (pounds per ton of asphalt)				
	CO	VOC	NO_x	SO_x	PM_{10}
Asphalt Batching Plant	0.340	0.017	0.025	0.005	0.020
	Assumed Unit Weight of Asphalt = 130.0 pounds per cubic-foot				

The annual construction equipment operating hours and the construction equipment exhaust emissions anticipated from the proposed construction activities associated with the proposed action and alternatives are provided below in the following tables:

Construction Equipment	Annual Construction Equipment Operating Hours		
	MHIR	MIR	MLIR
Backhoe	4.5	3.6	3.0
Blower	12.8	12.8	12.8
Bulldozer	16,472.5	15,178.7	14,412.2
Concrete Truck	1,342.9	1,260.9	1,218.3
Crane	0.0	0.0	0.0
Dump Truck	16,802.0	15,469.7	14,693.4
Front-End Loader	16,478.2	15,165.6	14,399.6
Paver	23.8	22.3	21.6

Roller	71.1	66.7	64.5
Scraper	14.3	13.4	12.9
Striper	12.8	12.8	12.8
18-Wheel Truck	185.3	164.6	159.0

	Proposed Construction Equipment Emissions - Tons Per Year (tpy)		
	MHIR	**MIR**	**MLIR**
CO Equipment Emissions (tpy)	31.69	29.22	27.77
CO Asphalt Emissions (tpy)	5.91	5.55	5.36
Total CO Emissions (tpy)	**37.61**	**34.77**	**33.14**
VOC Equipment Emissions (tpy)	8.70	8.01	7.61
VOC Asphalt Emissions (tpy)	0.30	0.28	0.27
Total VOC Emissions (tpy)	**8.99**	**8.29**	**7.88**
NO_x Equipment Emissions (tpy)	85.44	78.73	74.81
NO_x Asphalt Emissions (tpy)	0.43	0.41	0.39
Total NO_x Emissions (tpy)	**85.88**	**79.13**	**75.21**
SO_x Equipment Emissions (tpy)	9.48	8.73	8.30
SO_x Asphalt Emissions (tpy)	0.09	0.08	0.08
Total SO_x Emissions (tpy)	**9.57**	**8.82**	**8.64**
PM_{10} Equipment Emissions (tpy)	7.11	6.55	6.23
PM_{10} Asphalt Emissions (tpy)	0.35	0.33	0.32
Total PM_{10} Emissions (tpy)	**7.46**	**6.88**	**6.54**

G.6 CALCULATIONS FOR PRESCRIBED BURNING EMISSIONS REDUCTION

This subsection of the Air Quality Supporting Documentation includes information used in the calculation of prescribed burning emission reductions that would likely occur under the reuse alternatives. Included in the is subsection are the following materials:

- Contact Memorandum number 25 dated May 9, 1997 concerning Air Emission Reductions at FMC;
- pages 2-26 and 2-27 of the 1994 & 1995 Air Emission Inventory for the US Army Chemical and Military Police Centers and Fort McClellan dated May 1997;
- Table A-22 which captures emissions from prescribed burning for Fort McClellan, AL; and

- three pages of hand calculations for prescribed burning at FMC.