

Final
**Environmental Assessment
for BRAC 95 Realignment of
Detroit Arsenal, Warren, Michigan**



Prepared for
US Army Materiel Command

by
**US Army Corps of Engineers
Mobile District**

with Technical Assistance from
**Tetra Tech, Inc.
Fairfax, VA 22030
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ENVIRONMENTAL ASSESSMENT ORGANIZATION

This Environmental Assessment (EA) addresses the proposed action of realignment of Detroit Arsenal, Warren, Michigan. The EA provides analysis of the potential environmental and socioeconomic impacts as required by Army Regulation 200-2 and the National Environmental Policy Act.

An ***EXECUTIVE SUMMARY*** briefly describes the proposed action, environmental and socioeconomic consequences, and mitigation measures.

SECTION 1.0 PURPOSE AND NEED summarizes the purpose of and need for the proposed action and describes the scope of the environmental impact analysis process.

SECTION 2.0 DESCRIPTION OF THE PROPOSED ACTION describes the proposed action of realignment of Detroit Arsenal.

SECTION 3.0 ALTERNATIVES examines alternatives to implementing the proposed action.

SECTION 4.0 AFFECTED ENVIRONMENT describes the existing environmental and socioeconomic setting of Detroit Arsenal without the realignment action.

SECTION 5.0 ENVIRONMENTAL AND SOCIOECONOMIC CONSEQUENCES identifies potential environmental and socioeconomic effects of implementing the proposed action.

SECTION 6.0 FINDINGS AND CONCLUSIONS identifies potential impacts associated with the alternatives and draws a conclusion as to which alternative should be implemented.

SECTION 7.0 LIST OF PREPARERS identifies persons who prepared the document and their areas of expertise.

SECTION 8.0 DISTRIBUTION LIST indicates recipients of this EA.

SECTION 9.0 REFERENCES provides bibliographical information for cited sources.

SECTION 10.0 PERSONS CONSULTED provides a listing of persons and agencies consulted during preparation of this EA.

APPENDICES

- A*** Agency Consultation Letters
- B*** Record of Non-Applicability (RONA) Concerning the General Conformity Rule (40 CFR Part 93)
- C*** Economic Impact Forecast System (EIFS) Modeling Results

An ***ACRONYMS AND ABBREVIATIONS*** list (foldout) is provided immediately following the appendices.



**Finding of No Significant Impact (FNSI)
for the BRAC 1995 Realignment of the
Detroit Arsenal, Warren, Michigan**

1.0 PROPOSED ACTION

The proposed action is relocation of the Occupational Health Clinic; National Automotive Center; Tank-automotive and Armaments Command University; Raytheon shops; entomology services; ladder truck; Tank-automotive Research, Development, and Engineering Center laboratories; motor pool/wash rack; records storage; hazardous waste storage (90-day); and Defense Contract Management Command Office functions from Detroit Army Tank Plant (DATP) facilities to Detroit Arsenal. Due to a shortage of storage facilities to accommodate relocating warehouse functions, the Army also proposes to construct a 50,000-square-foot high-bay general-purpose warehouse on the west side of Detroit Arsenal. Upon disposal of DATP, Detroit Arsenal will consist of the western portion of the installation, plus Building 7 (research facility) and Building 8 (warehouse) located on the eastern portion.

2.0 ALTERNATIVES CONSIDERED

The No-Action Alternative. The Council on Environmental Quality (CEQ) regulations implementing the provisions of the National Environmental Policy Act of 1969 (NEPA) require Federal agencies to consider a "No-Action" alternative. These regulations define the "No-Action" alternative as the continuation of existing conditions and their effects on the environment, without implementation of, or in lieu of, a proposed action. Because of the compulsory nature of the 1995 BRAC Commission's recommendations once Congress has allowed them to become law, the Army may not select the No-Action alternative with respect to the relocation of functions from DATP facilities to Detroit Arsenal.

Alternatives to Construction and Renovation. Upon disposal of DATP and relocation of functions, there would be a shortfall of about 96,000 square feet of warehouse space at Detroit Arsenal. A survey by TACOM officials of all space owned by Detroit Arsenal revealed no suitable existing warehouse space that could be devoted to resolving the shortfall. The survey further indicated that there are no unused or underutilized facilities that could be converted from other use to warehouse use. TACOM review of leasing alternatives resulted in a finding that such means to accommodate warehouse requirements would not be cost-effective. Moreover, locating a part of the warehousing function off base in private-sector facilities could detract from operational efficiencies inherent in having all command assets in a single location. Leasing of off-site facilities would be contrary to the directive in the BRAC recommendation that realignment of functions, as necessary to close DATP, occur on Detroit Arsenal itself.

Renovation of Existing Facilities. Except for warehouse space, there are sufficient existing facilities on the west side of Detroit Arsenal to accommodate the personnel and workload to be realigned. Very minor renovations would be required to make the available space suitable for their use.

Construction of New Facilities. New construction is needed to accommodate relocating warehouse functions from DATP. Review of potential building sites on the arsenal for the new warehouse revealed three locations large enough to accommodate the proposed structure and its associated parking and perimeter security requirements. Application of general and specific site selection criteria eliminated two of the locations due

to incompatible land use and encroachment of the supply and storage function into areas presently designated for use for administrative purposes and as open space. A site along the northern boundary of the arsenal is the proposed location for the new warehouse.

3.0 FACTORS CONSIDERED IN DETERMINING THAT NO ENVIRONMENTAL IMPACT STATEMENT IS REQUIRED

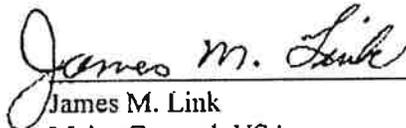
Implementation of the proposed action would result in either no impacts or impacts that are not significant. The various resource areas and areas of environmental concern evaluated include land use, climate, air quality, geology, water resources, infrastructure, hazardous and toxic materials, permits and regulatory authorizations, biological resources and ecosystems, cultural resources, economic development, sociological environment, quality of life, and installation agreements. Mitigation to avoid or reduce minor impacts would be achieved through the use of best management practices and other identified mitigation measures.

4.0 CONCLUSION

Based on the environmental impact analyses found in the Environmental Assessment, which is hereby incorporated into this FNSI, it has been determined that implementation of the proposed action would not have a significant direct impact on the quality of the natural or the human environment. Because no significant environmental impacts would result from implementation of the proposed action, an Environmental Impact Statement is not required and will not be prepared.

AMC plans to initiate this proposed action 30 days from the date of execution of this Finding of No Significant Impact. Copies of the EA may be obtained by contacting the U.S. Army Corps of Engineers, Mobile District, ATTN: CESAM-PD, Mr. Joe Hand, P.O. Box 2288, Mobile, Alabama 36628-0001, (334) 694-3881.

Date: 5 FEB 1998

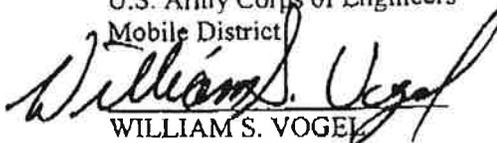


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ENVIRONMENTAL ASSESSMENT
REALIGNMENT
DETROIT ARSENAL

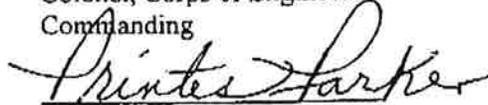
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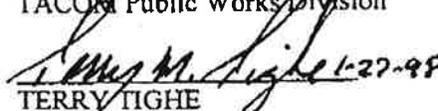
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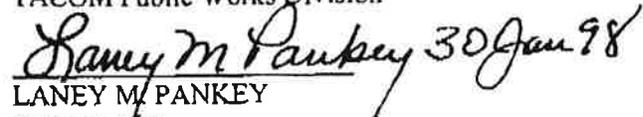


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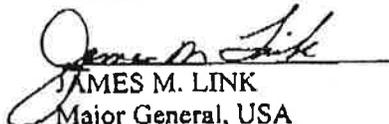
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ENVIRONMENTAL ASSESSMENT

LEAD AGENCY: U.S. Army Materiel Command (AMC)

TITLE OF PROPOSED ACTION: Environmental Assessment for BRAC 95 Realignment of Detroit Arsenal, Warren, Michigan

AFFECTED JURISDICTION: Macomb, Oakland, and Wayne counties, Michigan

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ABSTRACT: This Environmental Assessment addresses the realignment of Detroit Arsenal, Warren, Michigan, an action directed by the 1995 Defense Base Closure and Realignment Commission. The proposed action is presented and evaluated in this environmental analysis, as well as the no action alternative. Other alternatives are discussed but not analyzed because they were considered unreasonable. The effects of the proposed action on the environment and on social and economic systems are analyzed in the document. No significant adverse environmental or socioeconomic impacts have been identified. Therefore, preparation of an Environmental Impact Statement is not required and a Finding of No Significant Impact will be published.

REVIEW COMMENT DEADLINE: Comments may be provided to Mr. Joe Hand at the Corps of Engineers, Mobile District (ATTN: CESAM-PD-EC), 109 St. Joseph Street, Mobile, Alabama 36628-0001, or by facsimile at (334) 690-2721. Comments on this Environmental Assessment must be received within 30 days of the date of publication.

EXECUTIVE SUMMARY

INTRODUCTION

In 1995, the Base Closure and Realignment Commission recommended realignment of Detroit Arsenal and closure of Detroit Army Tank Plant (DATP). Closure of DATP must occur not later than July 2001. This Environmental Assessment analyzes the effects of the relocation of Detroit Arsenal functions from DATP facilities to the western portion of the installation.

BACKGROUND

The 342-acre Detroit Arsenal is located in Warren, Michigan, about 3 miles north of the Detroit city limits. DATP occupies 153 acres of the eastern portion of Detroit Arsenal. With the exception of Buildings 7 and 8, the entire DATP parcel and its improvements have been identified through the BRAC process as excess to the Army's needs and will be disposed of. Detroit Arsenal functions that use DATP spaces include the Occupational Health Clinic; National Automotive Center; Tank-automotive and Armaments Command (TACOM) University; Raytheon shops; entomology services; ladder truck; Tank-automotive Research, Development, and Engineering Center (TARDEC) laboratories; motor pool/wash rack; records storage; hazardous waste storage (90-day); and Defense Contract Management Command. These functions will be realigned to the west side of Detroit Arsenal, which is devoted to administrative and research activities. Upon disposal of DATP, Detroit Arsenal will consist of the western portion, plus Building 7 (research facility) and Building 8 (warehouse) located in the eastern portion.

PROPOSED ACTION

The Army's proposed action is the relocation of a variety of Detroit Arsenal functions from DATP facilities to the western portion of the installation as mandated by the 1995 BRAC Commission recommendation. Also, due to the shortage of storage facilities to accommodate warehouse functions, the Army would construct a 50,000-square-foot high-bay general-purpose warehouse on the west side of Detroit Arsenal. The new building would include a small administrative area and information support systems.

ALTERNATIVES

Alternatives for relocation of functions are not warranted due to the availability of existing facilities and, in limited instances, the potential for minor renovations of existing facilities. Alternatives for construction are not warranted due to the lack of existing warehouse space, the lack of facilities that could be converted from another use to warehouse use, and the inefficiency of having command assets located off base. Review of potential building sites for the new warehouse revealed three locations large enough to accommodate the proposed structure and its associated parking and perimeter security requirements. Application of general and specific site selection criteria eliminates two of the locations due to incompatible land use and encroachment of the supply and storage function into areas presently designated for use for administrative purposes and as open space. A location along the northern boundary of the arsenal is the proposed location for the new warehouse.

This document defines the continuation of existing environmental and socioeconomic conditions without implementation of the proposed action as the no action alternative. Inclusion of the no action alternative is prescribed by Council on Environmental Quality regulations as the benchmark against which federal actions are to be evaluated. Although the no action alternative is not feasible because action has been directed by the 1995 BRAC Commission, it is useful for comparison to the proposed action.

ENVIRONMENTAL CONSEQUENCES

Resource areas evaluated include land use, climate, air quality, noise, water resources, geology, infrastructure, hazardous and toxic materials, permits and regulatory authorizations, biological resources, cultural resources, economic development, sociological environment, and quality of life.

No Action. The baseline established to evaluate the environmental and socioeconomic effects of receiving the new activities is the condition and workforce levels at Detroit Arsenal at the time of the 1995 BRAC Commission's decision concerning the missions and functions to be relocated. The no action alternative represents no change from the baseline conditions, and therefore no impacts would be expected.

Proposed Action. The evaluation of the proposed action (preferred alternative) indicates that direct short-term minor adverse effects on air quality, noise, soil, and water resources would be expected as a result of construction and renovation activities. Direct long-term minor adverse effects would also be expected for soil resources as a result of permanent alteration of the soils in the area of the proposed construction. Direct long-term minor beneficial effects on air quality would be expected as a result of reduced installation emissions due to the closure of Building 5 (central heating plant). Direct and indirect short-term minor beneficial effects on economic development would be expected as a result of the construction and renovation activities.

Cumulative effects would include long-term minor adverse effects and long-term minor beneficial effects. The realignment of functions from DATP to the west side of Detroit Arsenal, coupled with the addition of several large businesses in the local area, would have an adverse cumulative effect on local traffic circulation, particularly during rush hours. Traffic circulation should be addressed by the Macomb County Road Commission to ensure adequate transportation corridors surrounding the arsenal. Economic stimulation through job creation and the input of millions of dollars of funds associated with the planned reuse of the eastern portion of the installation and the planned construction on the western portion of the installation, along with the planned new businesses in the area, would be a beneficial contribution to the city of Warren and the region of influence.

Table ES-1 summarizes the potential environmental and socioeconomic effects on the resources of Detroit Arsenal.

**Table ES-1
Summary of Effects for the Proposed Action**

Resource Area	Direct	Indirect
Land Use	No effect	No effect
Climate	No effect	No effect
Air Quality	A-	No effect
Noise	A-	No effect
Geology	A-	No effect
Water Resources	A-	No effect
Infrastructure	No effect	No effect
Hazardous and Toxic Materials	No effect	No effect
Permits and Regulatory Authorizations	No effect	No effect
Biological Resources	No effect	No effect
Cultural Resources	No effect	No effect
Economic Development	B-	B-
Socioeconomic Environment	No effect	No effect
Quality of Life	No effect	No effect
Installation Agreements	No effect	No effect
Cumulative Effects	A-/B-	A-/B-

A- Minor adverse effect
B- Minor beneficial effect

CONCLUSIONS

Analyses in the EA reveal that implementation of the proposed action would not result in significant environmental or socioeconomic effects. Issuance of a Finding of No Significant Impact would be appropriate, and preparation of an Environmental Impact Statement is not required prior to implementation of the proposed action.

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SECTION 1.0: PURPOSE, NEED, AND SCOPE

1.1 PURPOSE AND NEED

The 1995 Defense Base Closure and Realignment Commission (1995 BRAC Commission) recommended certain realignment and closure actions for military installations on July 1, 1995. These actions were approved by the President on July 13, 1995, and forwarded to the United States Congress. Subsequent review by the Congress did not alter any of the BRAC 95 Commission recommendations, which now must be executed under the provisions of the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510), as amended. This Environmental Assessment (EA) addresses the BRAC 95 Commission recommendations associated with the realignment of missions/functions from Detroit Army Tank Plant (DATP), Warren, Michigan, to Detroit Arsenal,¹ Warren, Michigan (see Figure 1-1).

1.2 SCOPE

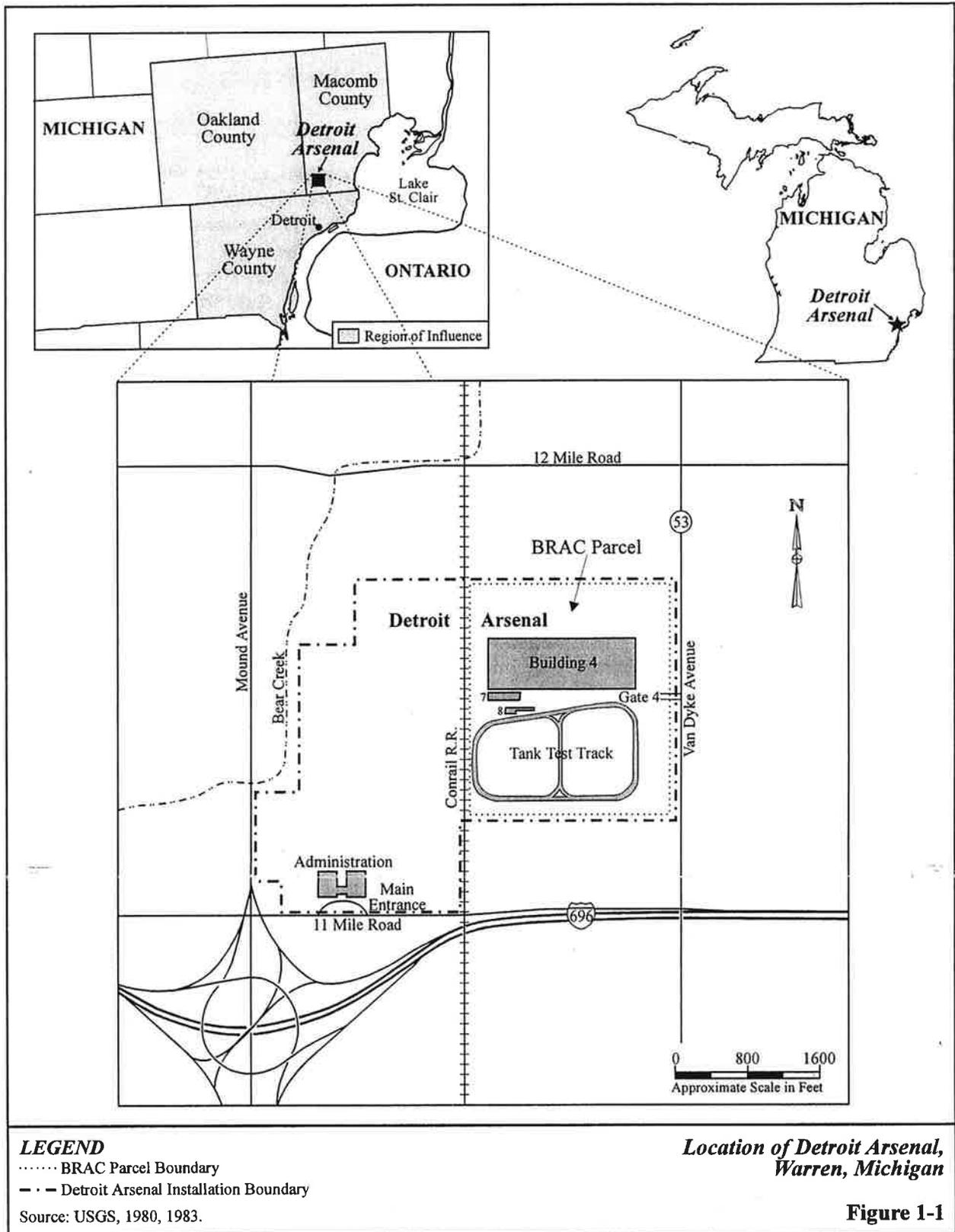
This EA analyzes and documents the environmental and socioeconomic effects associated with the realignment of personnel and functions from DATP to Detroit Arsenal. The Defense Base Closure and Realignment Act specifies that for BRAC actions, the National Environmental Policy Act (NEPA) does not apply to actions of the President, the Defense Base Closure and Realignment Commission, or the Department of Defense, except

(i) during the process of property disposal, and ... (ii) during the process of relocating functions from a military installation being closed or realigned to another military installation after the receiving installation has been selected but before the functions are relocated.

The act further specifies that in applying the provisions of NEPA to the process, the Secretary of Defense and the secretaries of the military departments concerned do not have to consider

(i) the need for closing or realigning the military installation which has been recommended for closure or realignment by the Commission, (ii) the need for transferring functions to any military installation which has been selected as the receiving installation, or (iii) military installations alternative to those recommended or selected.

¹ The Army is preparing a separate document, *Environmental Assessment for BRAC 95 Disposal and Reuse of the Detroit Army Tank Plant, Warren, Michigan*, to evaluate potential environmental effects related to the DATP action. That analysis is expected to conclude in 1997. A related BRAC Commission recommendation affected the Aviation-Troop Command (ATCOM) in St. Louis, Missouri, resulting in the relocation of 153 personnel from St. Louis to the Tank-automotive and Armaments Command at Detroit Arsenal and other locations. On July 24, 1996, the Army prepared a Record of Environmental Consideration related to the relocation of those 153 ATCOM personnel.



This EA includes the appropriate NEPA analysis for the Commission-directed action and addresses the cumulative effects of this action and other reasonably foreseeable future actions—federal and nonfederal—planned for Detroit Arsenal and the region of influence (ROI).

The study area for this EA includes Detroit Arsenal and its ROI, which consists of Macomb, Oakland, and Wayne counties, Michigan.

1.3 IMPACT ANALYSIS

This EA identifies and analyzes the relevant environmental and socioeconomic effects of the proposed action, as described in Section 2.0, Proposed Action, on the existing resources at Detroit Arsenal and within the ROI. An interdisciplinary team of engineers, biologists, archeologists, historians, and military experts has analyzed the proposed action against the baseline conditions described in Section 4.0, Affected Environment. Section 5.0, Environmental and Socioeconomic Consequences, identifies any effects and planned mitigation measures. Section 6.0, Findings and Conclusions, presents the results of the environmental impact analysis process.

The socioeconomic effects of the proposed action were assessed using the Economic Impact Forecast System (EIFS) developed by the U.S. Army Construction Engineering Research Laboratories. The ROI for socioeconomic effects associated with relocations to and construction at Detroit Arsenal is the standard metropolitan statistical area (shown in Figure 1-1).

1.4 AGENCY AND PUBLIC INVOLVEMENT

The Army provides for full public participation in the NEPA process to promote open communication and better decision making. Public participation is invited throughout the process.

Public opportunities to comment include the Notice of Intent (NOI) and consideration of public comments received during a 30-day waiting period after publication of the final EA. The NOI declaring the Army's intent to prepare an EA for the realignment of the Detroit Arsenal was published in the *Federal Register* on September 22, 1995.

The public and concerned organizations, including minority and low-income, disadvantaged, and Native American groups, will be notified of the findings and conclusions of the EA by publishing a Notice of Availability (NOA) in the local newspaper and placing the Finding of No Significant Impact (FNSI) in the *Federal Register*. The EA will be made available for public review 30 days prior to initiating actions. The Detroit Arsenal Public Affairs Office will keep the public informed on the status and progress of the proposed action.

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SECTION 2.0: DESCRIPTION OF THE PROPOSED ACTION

In response to national security changes, the Army plans to streamline its structure to enhance productivity and efficiency. Realignment of activities such as those which are the subject of this analysis helps to achieve greater productivity and efficiency. "Realignment" in this sense means the relocation of personnel and functions from DATP on the east side of Detroit Arsenal to the west side of Detroit Arsenal. The proposed action evaluated in this EA is the realignment of Detroit Arsenal as directed by the BRAC 95 Commission and physical modifications to Detroit Arsenal to accommodate the additional functions to be based there. Functions planned for relocation within Detroit Arsenal would be combined with similar functions already present to achieve maximum efficiency.

2.1 INTRODUCTION

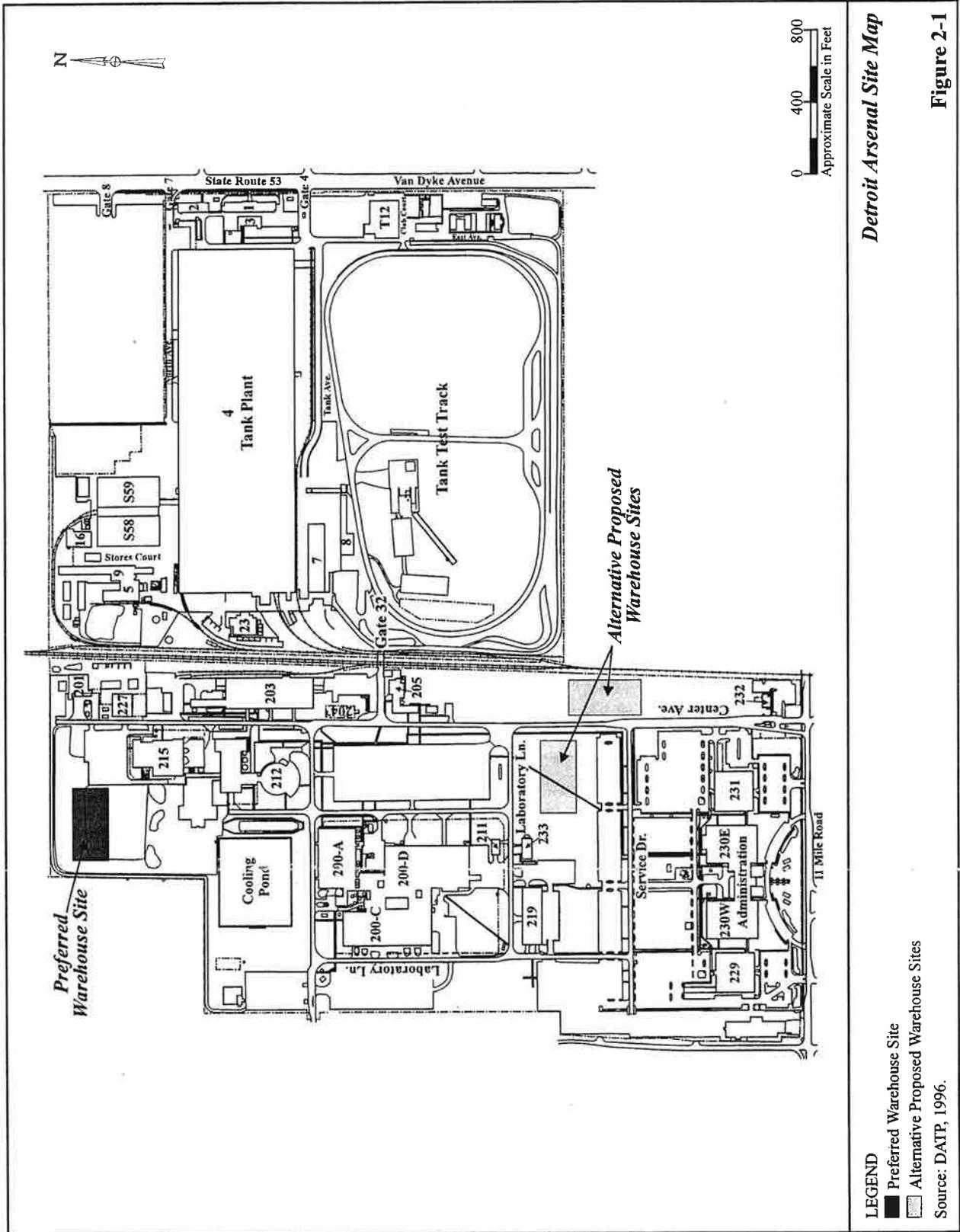
Detroit Arsenal is in Warren, Michigan, approximately 3 miles north of the Detroit city limits. The installation is situated in an industrialized and commercialized area dominated by the automotive industry. Residential areas lie to the west and southeast of the installation. A general site map is provided in Figure 2-1.

Occupying about 342 acres, Detroit Arsenal serves as the headquarters of the Tank-automotive and Armaments Command (TACOM). The primary mission of TACOM is the development, fielding, and sustainment of combat and tactical vehicles. Historically, Detroit Arsenal has served primarily as a production facility for tank components and a research and development test facility for tank-automotive vehicles. The Detroit Arsenal property is bisected by Conrail railroad tracks. The 153-acre DATP is on the east side, fronting Van Dyke Avenue, and is used for industrial activities. The 195-acre western portion of the installation is devoted to administrative and research activities. The 1995 BRAC Commission recommended the closure and disposal of the DATP. Upon disposal of DATP, the Army may convey Building 7 (research and development) and Building 8 (warehouse) within the DATP area on the east side of the Arsenal and take back a leasehold in those facilities in order to continue their use. Thus, following DATP disposal, the Detroit Arsenal will consist of the western portion of the present installation and Buildings 7 and 8.

2.2 REALIGNMENT OF FUNCTIONS

Closure and disposal of DATP necessitates the relocation of Detroit Arsenal functions from DATP facilities to facilities west of the Conrail railroad tracks. Detroit Arsenal functions and personnel that would be affected by the proposed relocations are described below.

- *Occupational Health Clinic.* The Occupational Health Clinic would move from Building 2 to the site of a previous health clinic in the northwest portion of Building 230W. The new location would provide facilities for the services of a physician, industrial hygienist, and assistant, as well as housing their equipment. The relocation action would require minor renovation, primarily involving the restoration of previous clinic fixtures, a minor expansion of the former health clinic spaces, and installation of medical facility-grade utilities and flooring. Three people would be involved.



Detroit Arsenal Site Map

Figure 2-1

LEGEND
 ■ Preferred Warehouse Site
 ■ Alternative Proposed Warehouse Sites
 Source: DATP, 1996.

- *National Automotive Center (NAC)*. The NAC, requiring 8,000 square feet of space, would move from its present location in Building 2 to the former library site in Building 200A. Interior renovation would entail installation of a new ceiling and lighting fixtures, and minor expansion. Twelve people would be involved.
- *TACOM University*. TACOM University, requiring 5,000 square feet of space for training and engineering functions, would move from Building 3 to vacant space in Building 200B. Five people would be involved.
- *Raytheon Shops*. The Raytheon function provides plumbing, electrical, and painting services. It would realign from Buildings 9 and 56 to become consolidated with similar upkeep functions currently housed in Building 203. Twenty-five people would be involved.
- *Motor Pool/Wash Rack*. The motor pool/wash rack function would move from Buildings 9 and T-57 to Building 203. The move would involve installation of an oil/water separator at the new site. Six people would be involved.
- *Entomology Services*. Currently located in Building T-72, Entomology Services (involved with application of herbicides and pesticides) would realign to a building on the east side of Detroit Arsenal. One person would be involved.
- *Tank-Automotive Research, Development, and Engineering Center (TARDEC) Total Armor Integration Laboratory (TAIL), and Meteorology and Calibration Laboratory*. These laboratories would move from Buildings 4A and S-58 to Buildings 212 and 200D, respectively. Nineteen people would be involved.
- *Hazardous Waste Storage*. This mission would be realigned from Building S-58 to a new warehouse proposed for construction (see Section 2.3) that would be suitable for storage of hazardous wastes for up to 90 days. One person would be involved.
- *Records Storage*. This function, requiring about 4,000 square feet of space for storage of temperature- and humidity-sensitive items and documents, would move from Building S-59 to the Building 224. One person would be involved.
- *Ladder Truck Bay Addition*. The ladder truck would be realigned from Building 203 (making way for incoming functions) to Building 205. This would colocate it with Fire Department assets. Building 205 would be expanded by construction of a storage bay to provide storage space for the ladder truck. Five people would be involved.
- *Defense Contract Management Command Personnel*. Elements of the Defense Contract Management Command (DCMC) would be relocated from Building 4, DATP to Building 231 on the west side of Detroit Arsenal to effect the plant clearance (closure) activity. Seventeen people would be involved.

Table 2-1 summarizes each of the functions proposed for relocation. For each function, the table shows the number of personnel involved, their present and proposed locations, and whether renovation would accompany their move.

**Table 2-1
Relocation of Functions**

Function	Personnel	Present Location	Proposed Location	Renovations
Occupational Health Clinic	3	Bldg 2	Bldg 230W	Yes
National Automotive Center	12	Bldg 2	Bldg 200A	Yes
TACOM University	5	Bldg 3	Bldg 200B	No
Raytheon Shops	25	Bldgs 9 & 56	Bldg 203	No
Motor Pool/Wash Rack	6	Bldgs 9 & T-57	Bldg 203	OWS ¹
Entomology Services	1	Bldg T-72	Bldg w/o Number ²	No
TARDEC, TAIL, & Calibration Labs	19	Bldgs 4A & S-58	Bldgs 212 & 200D	No
Hazardous Waste Storage	1	Bldg S-58	New Warehouse	No
Records Storage	1	Bldg S-59	Bldg 225	No
Ladder Truck	5	Bldg 203	Bldg 205	Yes
DCMC	17	Bldg 4	Bldg 231	No

¹ An oil/water separator would be installed.

² The structure to which Entomology Services is being realigned is located on the east side of Detroit Arsenal, but does not have an assigned building number (Tighe, personal communication, 1997).

2.3 CONSTRUCTION

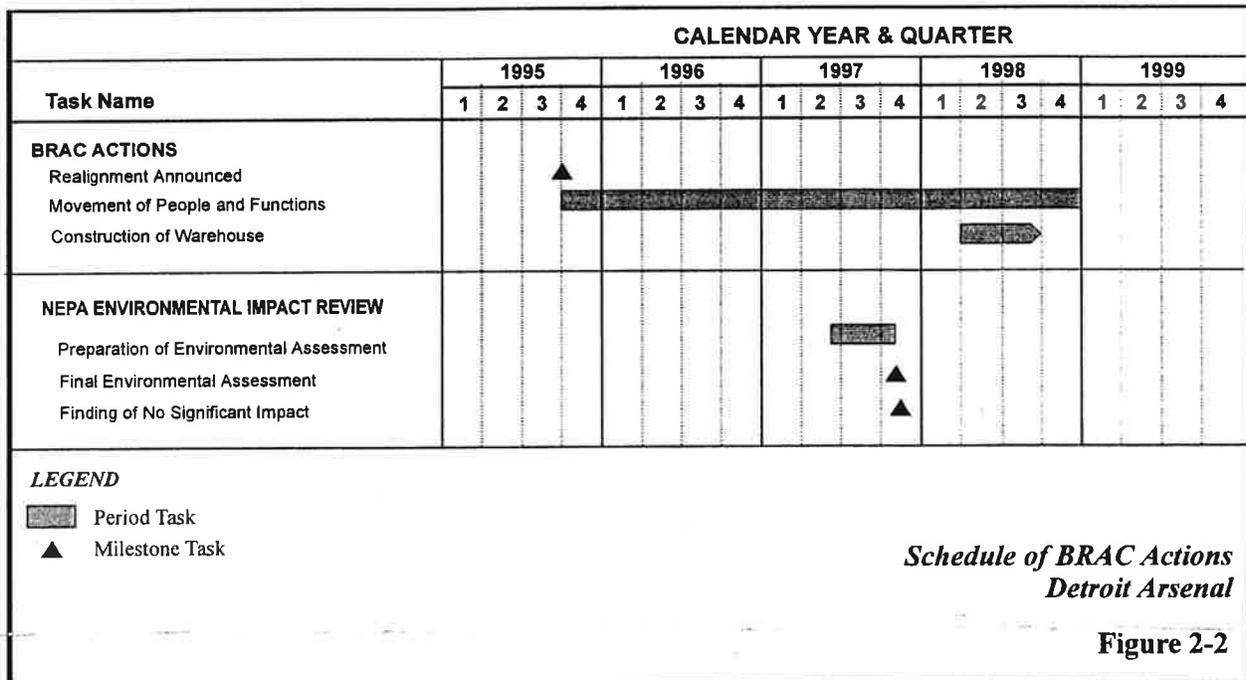
Disposal of DATP would reduce warehouse space available for Detroit Arsenal functions from 118,585 square feet to 22,194 square feet. About 96,000 square feet of the storage space has been in six warehouses located within the area occupied by DATP. These six warehouses have provided for storage of a wide variety of material used by the arsenal. Facilities also have been used to unpack shipments, organize disbursement, store supplies and equipment, and pack and load outgoing shipments. The closure of DATP results in a Detroit Arsenal shortfall of storage space required for installation equipment, supplies, furniture, machinery, and various types of testing equipment.

In light of the shortage of storage facilities to accommodate relocating and continuing functions, the Army would construct a 50,000-square-foot high-bay general-purpose warehouse on the west side of Detroit Arsenal. The new building would include a small administrative area and information support systems. Supporting facilities for the new warehouse would include necessary utilities, electrical service, security lighting, fire protection, storm and sanitary sewers, paving, walkways, and perimeter fencing. Air compressors, dryers, and natural gas distribution lines would be included as part of the construction project. The warehouse would have its own heat source and would not be connected to the installation's steam line. The exterior of the building would have a "split block" appearance (concrete along the ground level, with metal facade above) to match nearby Building 210. Upon completion, the facility would be staffed by one manager, one assistant manager, three clerks,

and 10 laborers. The proposed site for the warehouse is at the far northern end of the installation, as shown in Figure 2-1.

2.4 SCHEDULE

The proposed relocation of functions is intended to minimize the disruption of mission activities. Winding down of mission activities at DATP has commenced in anticipation of closure. (See Figure 2-2.) Personnel and functions located in the DATP portion of Detroit Arsenal would move onto remaining Detroit Arsenal property as facilities on the west side were readied to house them.



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SECTION 3.0: ALTERNATIVES

3.1 INTRODUCTION

Alternatives to the proposed action have been developed according to three variables—means to physically accommodate the realigned functions, siting of new construction, if required, and schedule. This section presents the Army's development of alternatives and addresses alternatives available for the proposed relocations. The section also addresses the no action alternative.

The Army's preferred alternative is implementation of the proposed action as described in Section 2.0.

3.2 DEVELOPMENT OF ALTERNATIVES

3.2.1 Means to Accommodate Realigned Functions

Relocation of functions involves ensuring that the receiving location has adequate physical accommodations for personnel, workload, and material. The Army considers four means of meeting increased space requirements:

- Use of existing facilities
- Modernization or renovation of existing facilities
- Leasing of off-base facilities
- Construction of new facilities

Army Regulation 210-20, *Master Planning for Army Installations*, establishes Army policy to maximize use of existing facilities. The regulation directs that installation commanders will not propose new construction in a Real Property Master Plan, and new construction will not be authorized to meet a mission that can be supported by existing underutilized adequate facilities, provided that the use of such facilities does not degrade operational efficiency. Under this policy, selection and use of facilities to support mission requirements adheres to the foregoing four choices in the order in which they are listed. That is, if there are adequate existing facilities to accommodate requirements, and absent other overriding considerations, further examination of renovation, construction, or leasing alternatives is not required. Similarly, if a combination of use of existing facilities and renovation satisfies the Army's needs, leasing or new construction need not be addressed.

3.2.2 Siting of New Construction

The Army considers new construction of facilities when use of existing facilities, renovation or modernization, and leasing would fail to provide for adequate accommodations of realigned functions. The Army considers both general and specific siting criteria for new construction to house facilities to support mission requirements.

General siting criteria include consideration of compatibility between the functions to be performed and the installation land use designation for the site, adequacy of the site for the function required, proximity to related activities, distance from incompatible activities, availability and capacity of roads, efficient use of property, and special site characteristics, including environmental incompatibilities.

Specific siting criteria include consideration of location of the workforce and efficient, streamlined management of operations. Collocation of similar types of functions, as opposed to dispersion, permits more efficient use of tools as well as easier inventory control of equipment and vehicles.

3.2.3 Schedule

Alternatives for scheduling of proposed relocations are principally affected by three factors: (1) the availability of facilities to house realigned functions, (2) efforts to minimize potential disruption of mission activities based on the number of personnel involved in the relocation or the amount of work to be performed, and (3) early realization of benefits to be gained by completion of the relocation. In most cases, minor shifts in schedules would not produce different environmental effects.

3.3 ALTERNATIVES FOR RELOCATION OF FUNCTIONS

The proposed action involves the relocation of personnel and workload related to 12 functions and construction of a warehouse to house material used in Detroit Arsenal operations. The functions subject to relocation include the Occupational Health Clinic, National Automotive Center, TACOM University, Raytheon shops, motor pool and wash rack, Entomology Services, TARDEC Total Armor Integration Laboratory, and Meteorology and Calibration Laboratory, hazardous waste storage, records storage, ladder truck, and Defense Contract Management Command personnel.

Except for warehouse space, there are sufficient existing facilities on the west side of Detroit Arsenal to accommodate the personnel and workload to be realigned. Very minor renovations would be required to make the available space suitable for their use. Use of leasing or new construction to provide space for DATP functions would be contrary to the hierarchy of means for satisfying space requirements described in Section 3.2.1. Off-site leasing would also be contrary to the directive in the BRAC recommendation that realignment of functions, as necessary to close DATP, occur on Detroit Arsenal itself. Due to the availability of existing facilities and—in limited instances—the potential for minor renovations of existing facilities, further consideration of alternatives based on leasing or new construction is unreasonable, infeasible, and otherwise not warranted. Therefore, they are not further examined in this EA.

3.4 ALTERNATIVES FOR CONSTRUCTION

3.4.1 Non-Construction Alternatives

Upon disposal of DATP and relocation of functions, there would be a shortfall of about 96,000 square feet of warehouse space at Detroit Arsenal. A survey by TACOM officials of all space owned by Detroit Arsenal revealed no suitable existing warehouse space that could be devoted to resolving the shortfall. The survey further indicated that there are no unused or underutilized facilities that could be converted from other use to warehouse use. TACOM review of leasing alternatives resulted in a finding that such means to accommodate warehouse requirements would not be cost-effective. Moreover, locating a part of the warehousing function off base in private-sector facilities could detract from operational efficiencies inherent in having all command assets in a single location. Leasing of off-site facilities would be contrary to the directive in the BRAC recommendation that realignment of functions, as necessary to close DATP, occur on Detroit Arsenal itself. For these reasons, alternatives involving use of existing facilities, renovation or conversion of existing facilities, and

leasing of off-base facilities to support Detroit Arsenal's warehouse requirements are not reasonable and, therefore, are not considered further.

3.4.2 Siting of New Construction

Evaluation of potential alternative sites for the new warehouse depends on consideration of matters such as the general and specific siting criteria listed in Section 3.2.2. In weighing potential sites, the Army also considers master plan land use categories and the level and types of development that already characterize an installation.

The west side of the Detroit Arsenal installation is moderately to highly developed. Approximately 75 percent of the installation's grounds are developed. Land use categories in use at the installation include administration, maintenance, industrial, supply and storage, and open space.

Review of potential building sites revealed three locations large enough to accommodate the proposed structure and its associated parking and perimeter security requirements. One site lies to the west of Center Avenue, north of Building 231 (Logistics and Operations) and north of the east wing of Building 230 (Headquarters). This site is bounded on the north by Laboratory Lane and on the south by Service Drive. A second site lies east of Center Avenue, along the Conrail tracks north of Building 232 (Main Gate Security Office). A third site lies in the western part of the northern extremity of the installation, northwest of Buildings 210 and 215 (Laboratories). These three locations are shown in Figure 2-1.

Application of the general and specific site selection criteria listed in Section 3.2.2 eliminates from further consideration the two potential building sites along Center Avenue. Siting of the warehouse in either of those locations would result in incompatible land use and encroachment of the supply and storage function into areas presently designated for use for administrative purposes and as open space. Location of the warehouse along Center Avenue could impede traffic along that main arterial street due to deceleration, slow acceleration, and turns of delivery trucks and semitrailers entering and departing the facility. Use of the northern building site would avoid this traffic safety issue. Vehicles would transit directly along Center Avenue, and their terminal activities would occur well out of the main traffic pattern. Use of either of the two southern sites would substantially reduce future siting options for all types of construction. In light of the pending disposal of DATP, retention of scarce buildable sites in the reconfigured installation and flexibility to accommodate future needs rise in importance as planning elements. For these reasons, use of either of the sites along Center Avenue is not reasonable and not further evaluated in this document.

3.5 SCHEDULE

Earlier relocations of functions from DATP to the west side of Detroit Arsenal would not be feasible because facilities required to support the functions would not be ready. Transfers of functions later than set forth in Section 2.4 would unnecessarily delay realization of benefits to be gained through realignment. Since a delay is avoidable and unnecessary, alternative schedules are not further analyzed.

3.6 *NO ACTION ALTERNATIVE*

The baseline established to evaluate the environmental and socioeconomic effects of receiving the new activities is the condition of Detroit Arsenal and the workforce levels at the arsenal at the time of the 1995 BRAC Commission's decision. The baseline is described in Section 4.0, Affected Environment. This document refers to the continuation of existing conditions of the affected environment without the implementation of the proposed action as the no action alternative. Inclusion of the no action alternative is prescribed by Council on Environmental Quality regulations. The no action alternative also serves as a benchmark against which the proposed action and alternatives can be evaluated.

SECTION 4.0: AFFECTED ENVIRONMENT

4.1 INTRODUCTION

This section describes the environmental and socioeconomic conditions at Detroit Arsenal, Warren, Michigan. It provides information to serve as a baseline from which to identify and evaluate environmental and socioeconomic changes resulting from implementation of the proposed action—realignment of Detroit Arsenal functions from facilities on the east side of the arsenal to facilities on the west side of the arsenal. The baseline conditions at Detroit Arsenal are those conditions present when the installation was recommended for realignment (July 1995). Two resource and topical areas commonly found in Army BRAC NEPA documents, Training Areas¹ and Legacy Resources,² were excluded from this EA because there were none present on Detroit Arsenal. The environmental and socioeconomic effects of the proposed action and alternatives, including the no action alternative, on the baseline conditions are described in Section 5.0. For purposes of this EA, the focus of the analysis is the western side of Detroit Arsenal, for which realignment of functions is anticipated.

4.2 LAND AND AIRSPACE USE

4.2.1 Regional Geographic Setting and Location

Detroit Arsenal lies 3 miles north of Detroit and Wayne County in the city of Warren, Macomb County, Michigan, in the southeastern part of the state. The installation is approximately 8 miles west of Lake St. Clair. Consisting of 342 acres, the installation is north of Interstate 696 and fronts on 11 Mile Road (running east-west). Detroit Army Tank Plant (DATP) occupies the eastern portion of Detroit Arsenal between a Conrail railroad line and Van Dyke Avenue, also designated as State Route 53 (running north-south). (See Figure 1-1.)

4.2.2 Existing Land Use

Principal portions of the arsenal are used for TACOM activities related to combat vehicle research and development, manufacturing, and production. Such activities are consistent with the city's zoning classification³. Other land uses at Detroit Arsenal include administrative and support services. The Army's *Land Use Plan for Detroit Arsenal, 1988* shows that the west side of the arsenal consists of administrative, research and development, testing, recreational, supply and storage, and utility uses (Harland Bartholomew & Associates, 1988).

The west side of the arsenal is characterized as being predominantly devoted to research and development and administrative use. The northwest corner of the arsenal, which is the preferred

¹ Training areas are portions of installations on which field training exercises or maneuvers take place. Detroit Arsenal has no areas devoted to field training.

² Legacy resources are resources managed with funds provided, beyond the necessity of compliance, to enhance efforts to preserve natural and cultural resources on specific installations. The Legacy Program is funded and managed by the U.S. Army Environmental Center. No legacy funding has been provided for Detroit Arsenal.

³ Land use classifications under the local municipal zoning ordinance reflect land uses in the area of Detroit Arsenal. They are not binding on the federal installation.

location for construction of the new warehouse, is identified by the installation master plan as a recreational area. The recreational area includes a softball field west of Building 215 and a tennis court, swimming pool, bath house, and picnic area just north of Arsenal Avenue near Gate 36. The softball field lies within the footprint of the proposed warehouse. Detroit Arsenal has not used the softball field for many years. In addition, the cooling pond in the northwest corner of the arsenal provides noncontact cooling water for the dynamometer laboratory. A vehicle fording pit lies between the cooling pond and Building 212.

4.2.3 Surrounding Land Use

Warren's zoning classification for the area surrounding much of Detroit Arsenal is Industrial (Medium-Heavy). All of the area surrounding Detroit Arsenal is heavily urbanized and consists of a mix of industrial, commercial, and residential uses. North of the arsenal, land is used primarily for industrial purposes, many of which are related to the automotive industry. There is a heavy concentration of commercial strip development along the Van Dyke Avenue/Mound Road corridor in the vicinity of Detroit Arsenal. The southern portion of the installation is bordered by 11 Mile Road. Adjoining this area are single-family homes (the closest of which are within 200 feet of the test track), industrial uses, and a small mobile home park. The western limit of Detroit Arsenal is bounded by Mound Road, along which there is a mix of industrial, commercial, and residential uses.

4.2.4 Airspace Use

Airspace use within this immediate area is influenced by the proximity of several airports, flight paths, and controlled and restricted airspace, as depicted on the *Detroit Sectional Aeronautical Chart*, dated October 10, 1996 (U.S. DOC, NOAA, 1996). Selfridge Air National Guard Airfield; Detroit Metro Wayne County, Willow Run, Big Beaver, Oakland/Troy, Berz-Macomb, Marine City, Canton-Plymouth-Mettetal, Oakland International, Windsor, Romeo, and Detroit City Airports; and several unnamed airports are located in the area. Detroit Arsenal lies within controlled airspace associated with airport-related traffic. Several flight paths traverse the airspace area. In terms of military airspace, restricted area R-5502 lies directly south of the arsenal and Steelhead, Pike East, and Pike West Military Operations Areas lie directly north of the installation. In addition, Canadian advisory areas CYA 519 and 529 are located southeast and northeast of the arsenal, respectively.

4.2.5 Future Land Use

The city of Warren is one of 27 cities, villages, and townships within Macomb County. With a land mass of 482 square miles, the county ranks third in both population and state-equalized valuation among the state's 83 counties. Warren is the state's third most populous city.

Less than half of Macomb County's land is fully developed. Most of the property available for development lies in the northern portion and the eastern portion of the county near Lake St. Clair.

Current and proposed land uses reflect the county's current economic growth. As of February 1997, 63 major economic development initiatives were planned to occur or just getting under way in Macomb County (Morandini, personal communication, 1997). Six of these would be located within Warren:

- *Chrysler Corporation:* A \$193 million investment/purchase of new equipment and machinery at the Dodge City Complex (retention of 2,700 jobs).
- *SMW Automotive Corporation:* A \$3 million investment/lease of an 80,000-square-foot manufacturing facility (creation of 50 jobs).
- *The Becker Group:* A \$3 million investment/construction of a 38,000-square-foot manufacturing facility (creation of 75 jobs).
- *Elias Brothers/Marriott Distribution Services:* A \$5 million investment/construction of a 104,000-square-foot food manufacturing and distribution facility (creation of 20 jobs).
- *Iroquois Die and Manufacture:* A \$2 million investment/construction of a 42,000-square-foot addition to an existing manufacturing facility (creation of 20 jobs).
- *Warren Schools Credit Union:* A \$4.75 million investment/construction of a new 28,000-square-foot headquarters and customer service facility (retention of 70 jobs and creation of 12 jobs).

Other notable development actions pending within the county include the following:

- *Chrysler Corporation:* A \$178 million investment/construction project (retention of 3,420 jobs).
- *The Shops at Sterling Ponds:* A \$100 million investment/K-Mart Super Store and 10 other retail facilities (creation of 1,000 jobs).
- *Ford Motor Company:* A \$156 million investment/purchase of new equipment and machinery (retention of 360 jobs).

Transportation improvements are designed to keep pace with Macomb County's economic development. In February 1997, the Macomb County Road Commission submitted its long-term plans for road improvements to the Southeast Michigan Council of Governments. To address projected congestion, the approved plans call for development of five-lane roads all across the county by the year 2020.

4.3 CLIMATE

The climate in the Detroit area is characterized by warm summers, cold winters, and occasional wide variations in temperature. Annual temperatures average from 25 degrees Fahrenheit (°F) in the winter to 74 °F in the summer. The average annual precipitation is 32 inches. The prevailing winds are from the southwest throughout the year, at an average wind speed of 10 miles per hour. (JAYCOR Environmental, 1993).

4.4 AIR QUALITY

4.4.1 General Air Quality Conditions

Air quality is regulated at the national level through regulations promulgated under the Clean Air Act (CAA) of 1970 and its subsequent amendments. The act directed the United States Environmental

Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) for air pollutants that endanger public health. USEPA subsequently adopted air quality standards for six of these "criteria pollutants": ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), inhalable particulate matter (PM₁₀), and lead (Pb) particles. The Clean Air Act requires state or local governments to monitor ambient levels of these pollutants and to develop air quality management plans to ensure compliance with the standards. Areas that violate these standards are designated "nonattainment" areas for the relevant pollutants.

To evaluate compliance with the NAAQS, USEPA has divided the country into geographical regions known as air quality control regions (AQCRs). Many AQCRs have air monitoring stations to sample ambient air quality levels of the criteria pollutants. Detroit Arsenal is located in the Metropolitan Detroit-Port Huron Intrastate AQCR. Two air quality monitoring stations within the AQCR are located near the arsenal in Macomb County. One station is in Warren, Michigan, and the other is in New Haven, Michigan. The Warren station measures O₃, SO₂, and CO; the New Haven station measures only O₃ (HQDA, 1991). The Metropolitan Detroit-Port Huron Intrastate AQCR has been designated as an attainment area for all criteria pollutants except CO, which is in nonattainment (Maupin, 1997).

4.4.2 On-Site Air Pollutant Emissions

There are 12 air emission source categories on the west side of the arsenal. Of these, nine are stationary point sources and three are stationary fugitive sources or sources whose emissions cannot reasonably pass through a vent, stack, or functionally equivalent opening. Fugitive emission sources at Detroit Arsenal include pesticide applications and miscellaneous chemical usage. There are two permitted air sources on the west side of the arsenal (see Section 4.10.1). The permitted point sources pertain to engine test cell exhaust originating from Building 212 and vents from a carpenter shop located in Building 203. The relevant air pollutants are nitrogen oxide (NO_x) and CO, and airborne particulate matter, respectively. Other sources of air emissions (which do not have to be permitted) include the degreasing operations in Buildings 200D, 203, 212, 215, and 219; one diesel generator housed in Building 200; two diesel generators housed in Building 205; one diesel generator housed in Building 232; surface coating operations housed in Buildings 200D and 203; abrasive blasting operations in Buildings 200D and 212; and degreasing operations in the various maintenance areas (EARTH TECH, 1996).

An air emissions inventory of Detroit Arsenal was completed in January 1996. The inventory found that *potential* emissions from stationary sources at Detroit Arsenal would exceed the major source thresholds for CO, NO_x, SO₂, and PM₁₀. The most significant source category at Detroit Arsenal causing potential emissions to exceed major source thresholds are the natural gas and bituminous coal boilers in Building 5 of DATP. The coal boilers are used to meet the winter steam requirements and have historically had problems with complying with CAA restrictions on smoke opacity. To bring Building 5 into compliance with CAA, Title V, a Renewal Operating Permit would have to be submitted, natural gas monitoring meters added to each of the gas-fired boilers, and stack monitoring conducted on both of the stacks on site. Building 5 will be disposed of along with DATP as part of the 1995 BRAC Commission recommendations (Parker, personal communication, 1997b).

In terms of *actual* emissions, the emissions inventory found that emissions from stationary sources at Detroit Arsenal in 1994 were below the major source thresholds for CAA-regulated pollutants. Table 4-1 presents the 1994 actual criteria and hazardous air pollutant (HAP) emissions⁴ from stationary sources at the installation (EARTH TECH, 1996). Detroit Arsenal has no active outstanding noncompliance air issues (Parker, personal communication, 1997c).

4.4.3 Off-Site Air Pollutant Emissions

There are approximately 160 major sources of emissions within the air quality region, each of which produces more than 100 tons per year of emissions (McLemore, personal communication, 1996). In addition, many more minor emission sources within the region contribute air pollutants. Due to the nonattainment status for carbon monoxide within the region, pollutants from automobiles are of particular interest. Given the high traffic volume on roadways adjacent to Detroit Arsenal (Mound Road, Van Dyke Avenue, and 12 Mile Road convey on average 158,000 vehicles per day) and high-congestion traffic conditions reported on these roadways, there is a potential for localized air quality problems. These problems (e.g., undesirable levels of carbon monoxide at a congested intersection) are relatively independent of the approximately 4,000 commuting vehicles used by employees of the arsenal under baseline conditions.

4.5 NOISE

Army Regulation 200-1, *Environmental Protection and Enhancement*, requires Army installations to control environmental noise to protect the health and welfare of people on and off the installation and

Table 4-1
1994 Actual Criteria Pollutant Emissions from Stationary Sources at
Detroit Arsenal

Pollutant	Tons/Year	Applicable <i>De Minimis</i> Threshold Tons/Year
TSP ¹	4.28	N/A ²
PM ₁₀	3.30	70
CO	14.63	100
SO ₂	54.81	100
NO _x	46.20	100
VOCs ³	8.64	50
Pb	.01	25
1995 total criteria pollutant emissions = 131.87 tons/year		

¹ Total suspended particulates.

² Not applicable.

³ Volatile organic compounds.

Source: EARTH TECH, 1996.

⁴ Potential emissions are compared to the major source thresholds to determine whether a source is major. However, potential emissions data for Detroit Arsenal are unavailable.

reduce community annoyance to the extent feasible, consistent with Army training and materiel testing activities.

As part of the Environmental Noise Management Program (ENMP), the Department of the Army monitors the noise environment to continually evaluate the impact of noise produced by ongoing and proposed Army actions/activities and to minimize impacts and annoyance to the greatest extent practicable. The ENMP is intended to prevent future land use conflicts by working with communities to limit encroachment. Army policy defines three noise zones as land use determinants for ENMP investigations—Zone I (considered acceptable for all land uses), Zone II (normally unacceptable for sensitive land uses⁵), and Zone III (unacceptable for sensitive land uses). (See Table 4-2.) The most significant generator of noise on Detroit Arsenal is the Tank Test Track, located in the southeastern portion of the arsenal (on the BRAC parcel). The noise associated with tank testing caused complaints from residents of the neighborhood located approximately 200 feet from the test track. In 1977, the Army responded by constructing a 5½-foot-high, acoustically designed sound barrier along the south and east sides of the test track. In addition, DATP began to limit the use of the test track to 7:00 a.m. to 6:00 p.m. (HQDA, 1991).

In 1988 and 1992, the Army conducted noise analyses consistent with ENMP standards to further investigate the noise environments around the installation. The analysis determined that neither Zone III nor Zone II noise zones are produced as a result of Army actions/activities on Detroit Arsenal.

Since the construction of the noise barrier, Detroit Arsenal has not received any noise complaints. In addition, in 1991 assembly of the M1A1 Main Battle Tank was terminated. As a result, tanks are no longer test-driven on the track on a consistent basis. With the impending closure of DATP, all manufacturing of tracked vehicles has stopped and noise levels have remained at acceptable levels on and off the installation (DATP, 1992).

4.6 GEOLOGY

4.6.1 Physiography and Topography

Detroit Arsenal is located in the southeastern part of Michigan's southern peninsula within the lake section of the Central Lowlands physiographic province. The area is characterized by a broad, flat to very gently sloping plain formed by glacial lakes during the Quaternary Period (2 million years ago to present). The area consists of interbedded glacial clays, silts, sands, and gravel that were laid down in glacial lake beds, or in end moraines or outwash areas.

4.6.2 Structure and Stratigraphy

In Macomb County, bedrock occurs at about 140 to 180 feet below the ground surface. The bedrock consists of thick sequences of consolidated sedimentary rocks including primarily sandstones,

⁵ Sensitive land uses include general housing, medical facilities, and schools.

Table 4-2
Noise Zones

Noise Zones	Percent of Population Highly Annoyed	Noise Limits, ADNL, ¹ dBA ²
I	Less than 15	Less than 65
II	15-39	65-75
III	Greater than 39	Greater than 75

¹ ADNL = A-scale day-night level.

² dBA = A-weighted decibels.

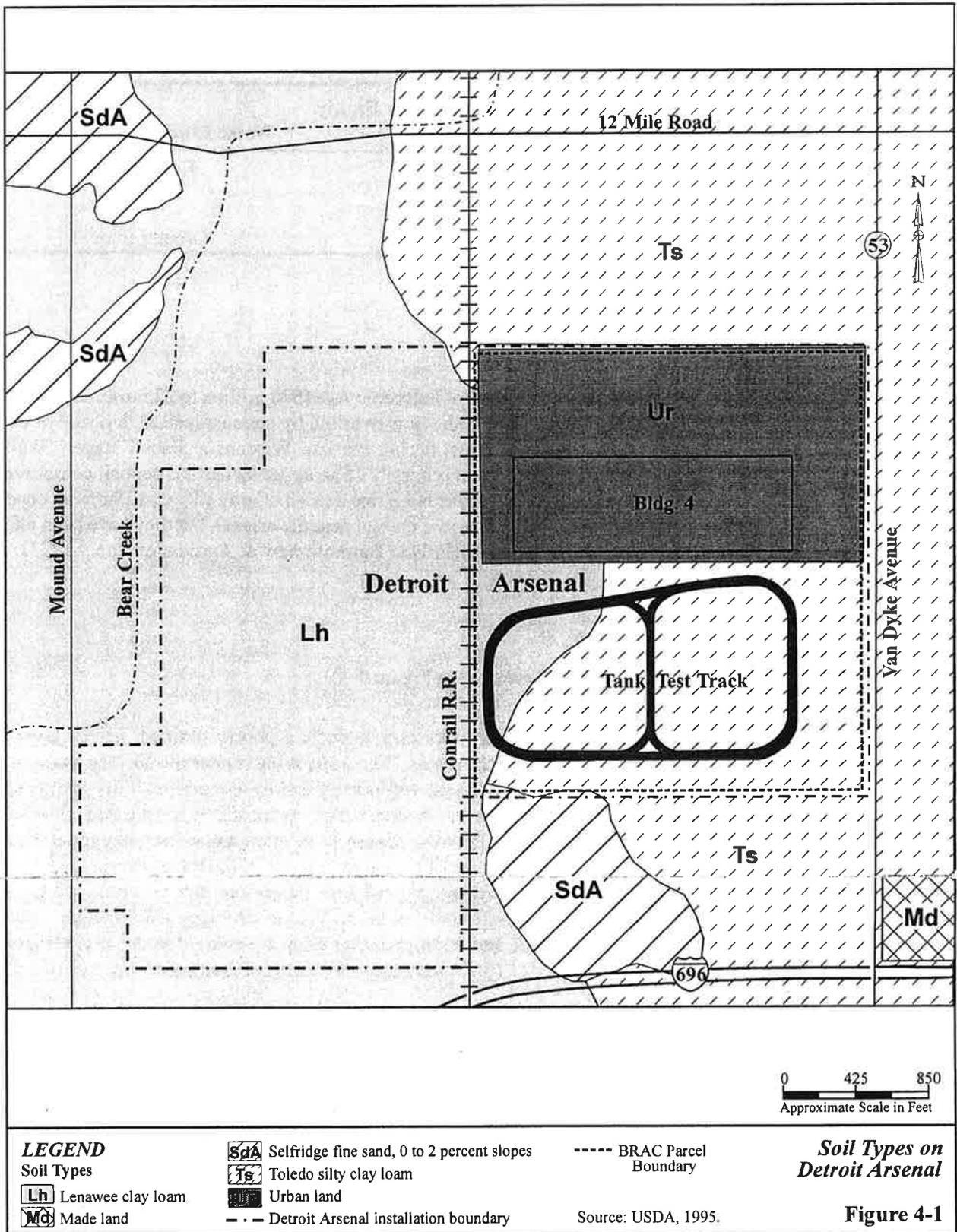
Source: DATP, 1992.

limestones, dolomites, shale, and evaporates of Paleozoic Age (570 million to 225 million years ago) (USGS, 1975, cited in SAIC, 1996). The bedrock is overlain by unconsolidated deposits of clays, silts, sands, and gravel that were laid down during the late Wisconsin glacial stage. Shallow unconsolidated deposits at the arsenal consist primarily of an upper lacustrine deposit composed of brown silty to sandy clay, which overlies a lower lacustrine deposit of gray silty clay. Surficial deposits such as glacial moraines and outwash features are present near the arsenal, but they have been altered by grading and fill activities at the arsenal (Harland Bartholomew & Associates, Inc., 1995).

4.6.3 Soils

Three soil types occur on Detroit Arsenal (see Figure 4-1).

- *Toledo silty clay loam.* The Toledo silty clay loam is a poorly drained, nearly level and depressional soil that occurs on the lake plains. The water table is near the surface much of the year unless the soils are artificially drained. Infiltration is slow and permeability is very slow. The Toledo silty clay loam is designated as hydric, which means that it is saturated, flooded, or ponded for long enough during the growing season to develop anaerobic (oxygen-deficient) conditions in its upper part. The presence of hydric soils is one of the three criteria (hydric soils, hydrophytic vegetation, wetland hydrology) used to determine the presence of USACE jurisdictional wetlands. Shrink-swell potential in the Toledo silty clay loam is high. Surface cracks that are 1 to 2 inches wide and 10 to 15 inches deep are evident in dry periods and are closed by swelling in wet periods. The Toledo silty clay loam is prevalent on the east side of the arsenal (USDA, 1995).
- *Urban land.* The Urban land soil mapping unit consists of areas that are so altered or obscured by urban works that identification of soils is not feasible. Recommendations for use and management in areas mapped as Urban land require on-site investigations. Urban land is prevalent on the east side of the arsenal (USDA, 1995).
- *Lenawee clay loam.* The Lenawee clay loam consists of level and nearly level, poorly drained, moderately fine textured soils that formed in calcareous clay loam and silty clay loam lacustrine material on the lake plains. The Lenawee clay loam is designated as hydric. Limitations of the



Lenawee clay loam are seasonal high water tables, moderately slow permeabilities, and moderate to high shrink-swell potential. Lenawee clay loam covers most of the western side of the arsenal (USDA, 1995).

4.7 WATER RESOURCES

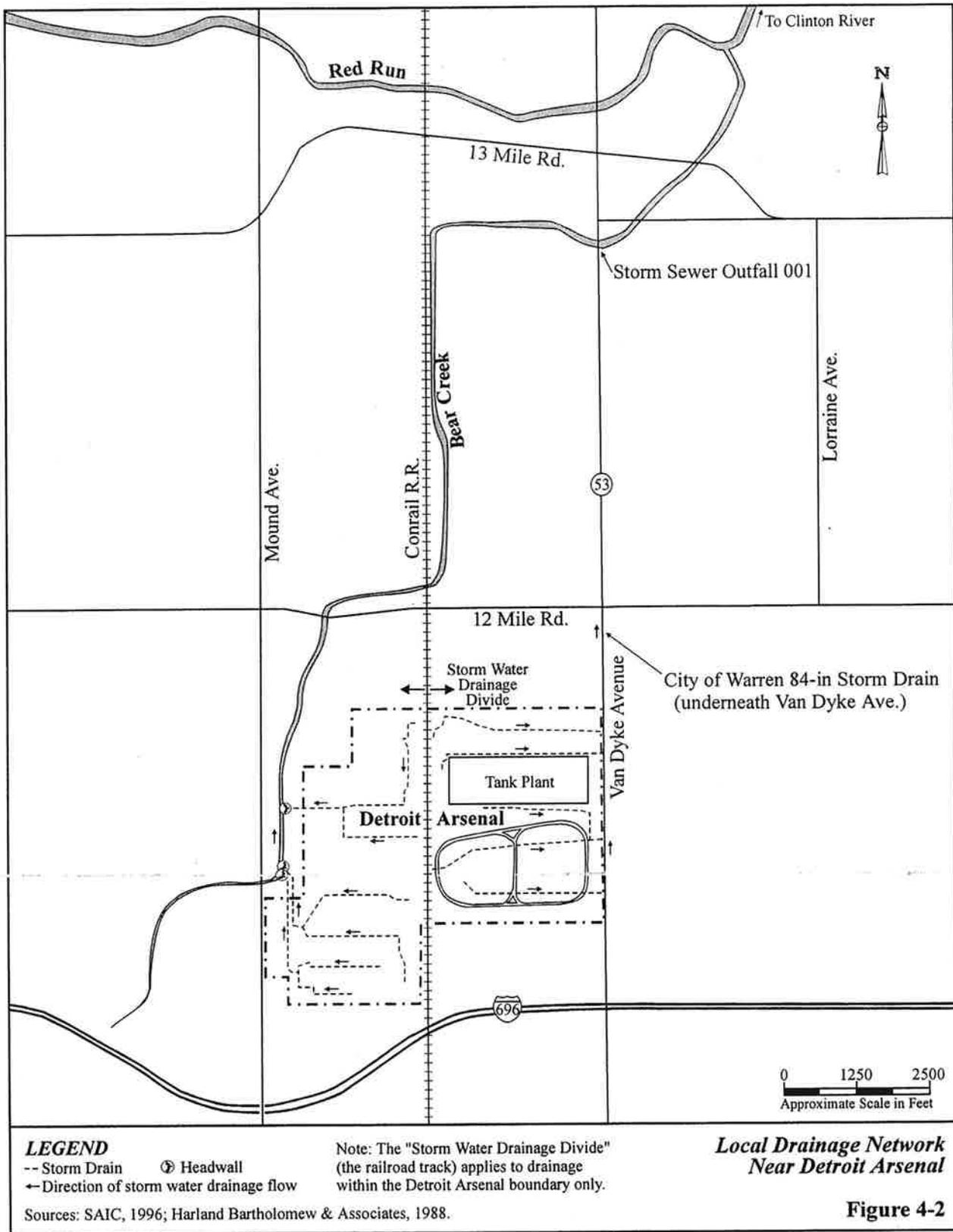
4.7.1 Surface Water

Detroit Arsenal is located within the Clinton River Drainage Basin. The drainage basin includes the Red Run River, Bear Creek, Paint Creek, West Brook, Stony Creek, Deer Creek, the Detroit River, the Plum River, and the Clinton River. Bear Creek, which is the only major surface water resource near the arsenal, is approximately 4.5 miles long and drains an area of 17.3 square miles. It flows in a northward direction along the western boundary of Detroit Arsenal and discharges directly into the Red Run River about 2 miles north-northeast of the installation. The Red Run River eventually empties into the Clinton River approximately 7 miles northeast of the installation. The Clinton River, which originates about 12 miles northwest of the installation, flows in an easterly direction and eventually empties into Lake St. Clair at L'Anse Creuse Bay just north of St. Clair Shores (HQDA, 1991).

Natural drainage on Detroit Arsenal occurs along broad, flat to gently sloping topography and is collected by Bear Creek (see Figure 4-2). The natural drainage patterns on the installation have been altered by construction of an extensive storm sewer system and the Conrail railroad track. The railroad track, which is aligned in a north-south direction, forms a divide for surface water runoff separating the Detroit Arsenal into two main drainage areas. The storm drainage system on the west side leaves the arsenal at three locations along the western boundary. Two of the three stormwater outfalls discharge directly into Bear Creek. The third outfall discharges into the City of Warren 54" main. Storm water from the BRAC property on the eastern side of the installation is collected by five storm water catch basins and discharged into the 84-inch-diameter city sewer main underlying Van Dyke Avenue. Water flows along the sewer main in a northward direction and discharges into Bear Creek at outfall 001 approximately 1.5 miles north of the installation (SAIC, 1996). Discharges from Detroit Arsenal to Bear Creek include storm water and noncontact cooling water from the air-conditioning units located within DATP. Both discharges are authorized under NPDES permits (see Section 4.10.2) and are monitored weekly for pH, flow, temperature, and observable characteristics (SAIC, 1996).

Storm water system inspections by federal and state personnel have not resulted in any notices of violation (Hamor, 1995 cited in SAIC, 1996). The latest inspection by USEPA Region 5 personnel on September 26, 1988, noted no deficiencies. Inspections by city personnel have not detected any storm water problems with the arsenal (JAYCOR, 1995, cited in SAIC, 1996).

The surface water quality of the Red Run River and Bear Creek, which receive the discharges from Detroit Arsenal, is considered to be poor but does not violate state water quality standards. Most portions of Bear Creek have been channelized to accommodate urbanization (HQDA, 1991).



4.7.2 Hydrogeology/Groundwater

Detroit Arsenal is underlain by a sequence of shale, limestone, dolomite, and sandstone deposited during the Mississippian and Devonian Periods. Typically, the depth to bedrock in Macomb County is 140 to 180 feet. The bedrock is overlain by a thick glacial drift unit deposited 10,000 to 3 million years ago during the Pleistocene Age. Both the bedrock and unconsolidated drift strata can act as an aquifer and allow groundwater to pass through the pore spaces (JAYCOR Environmental, 1993, cited in SAIC, 1996).

Groundwater below the arsenal is separated into an upper shallow aquifer and a deeper water supply aquifer (see Figure 4-3). The upper aquifer, the Glacio-Lacustrine Aquifer, is USEPA Class III and is not a potential source of drinking water. This aquifer consists of glacial drift (clay, sand, and gravel lenses), and groundwater flows are toward the north to northeast. The low hydraulic conductivity of the aquifer (10^{-6} feet per day to 1 foot per day) reduces its susceptibility to widespread groundwater contamination and migration (JAYCOR Environmental, 1993, cited in SAIC, 1996). Historically, the upper aquifer was typically less than 6 feet below ground surface in the Detroit Arsenal area; however, because of significant disturbances such as the construction of Interstate 696, the groundwater table is often more than 20 feet below the surface (HQDA, 1994).

The lower aquifer, the Paleo Beach Sand Aquifer, is a USEPA Class II aquifer. It is less vulnerable than a Class I aquifer because it is semiconfined by overlying glacio-lacustrine silty to sandy clays. The lower aquifer lies below bedrock at 148 feet below surface and is used for potable water supply with wells furnished in sand at depths of 100 to 110 feet (HQDA, 1994; Parker, personal communication, 1997a).

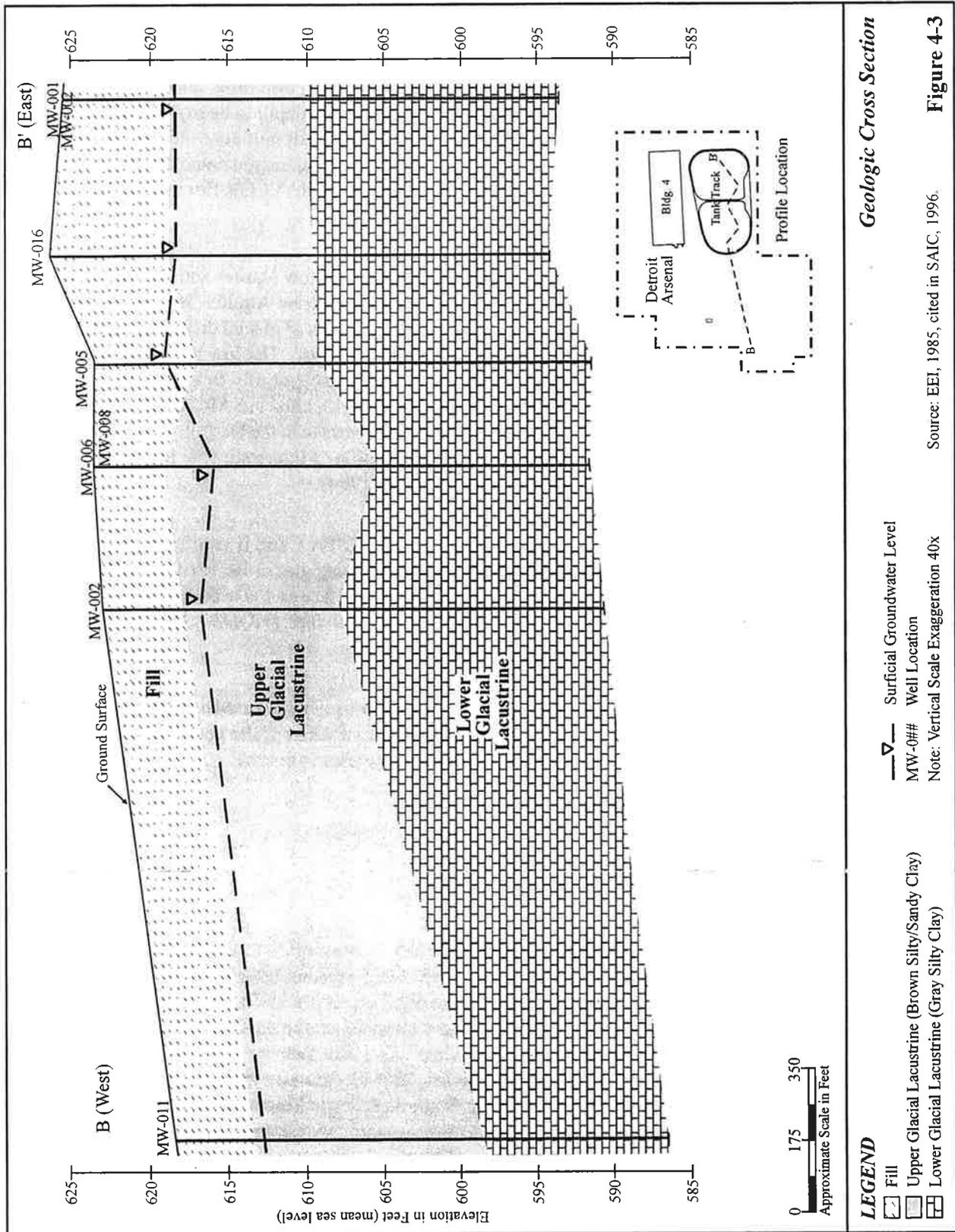
There are no known or confirmed groundwater contamination issues associated with the west side of Detroit Arsenal. However, potential groundwater contamination of the upper aquifer in the vicinity of Building 200C (heat treatment area) is suspected (Parker, personal communication, 1997c).

4.8 INFRASTRUCTURE

4.8.1 Potable Water Supply

Approximately 74 million gallons of potable water⁶ was supplied to Detroit Arsenal by the city of Warren municipal system in 1995, down from 235.6 million gallons in 1985 (Parker, personal communication, 1996a). The water supply system at Detroit is a unified system that includes both the east and west sides of the arsenal. No limits are imposed on the amount of water purchased by the arsenal since the city has an adequate water supply and adequate service connections to the arsenal (HQDA, 1991; Parker, personal communication, 1996c). The city of Warren purchases its potable water from the city of Detroit. The Detroit Water and Sewer Department withdraws potable water from the Detroit River and Lake Huron at an average daily withdrawal rate of 590 million gallons per day (mgd) during the winter months and has historically increased to over 1 billion gallons per day (bgd) during the summer months.

⁶ Includes Powerhouse potable water consumption.



The water supply system at Detroit Arsenal is in excellent condition, although some parts of the system date back to 1941. The water system mains are constructed of cast iron and ductile iron. Smaller service lines (1 inch or less in diameter) are constructed of copper with solder joints. Some PVC piping has also been incorporated into the system in recent years (Parker, personal communication, 1996c).

4.8.2 Wastewater Treatment

The Detroit Arsenal sewer system consists of a gravity collection system, two industrial pretreatment systems, and two discharge points to the city of Warren's collection system, which ultimately channels to the publicly owned treatment works for treatment of all the arsenal's wastewater (Parker, personal communication, 1997b). The arsenal uses sewage pretreatment facilities at two locations to keep its effluent in compliance with standards set by the city of Warren. The larger facility is located in Building 23 on the east side of the arsenal. It provides processes to remove electroplating wastes, degreaser wash water, and reclaimed machine coolants. The other pretreatment facility is located at the coal storage yard (Building T-87 on the east side of the arsenal) to treat runoff from the coal pile (HQDA, 1991).

The arsenal's entire sanitary sewer system discharges to the city of Warren's sewage treatment plant. The treatment plant has a design capacity of 50 mgd and discharges into the Red Run River drainage system. The arsenal's 1988 *Master Plan Report* stated that total flows from the arsenal would be accepted by the city of Warren as long as pretreatment of effluent continues to meet city standards.

4.8.3 Solid Waste Disposal

The solid waste generated at the arsenal consists of wood, paper, scrap metal, general refuse from cafeterias, and fly-ash from coal-fired boilers. Cutting oils from machining operations are picked up and recycled by a local vendor. The solid wastes are collected and transported to an approved landfill by a licensed contractor in compliance with applicable criteria in Michigan Public Act 64. In 1995, approximately 54,184 cubic yards of solid waste was generated by Detroit Arsenal operations and was disposed of by City Waste Systems, Inc. at the Auburn Hills facility (Harland Bartholomew & Associates, 1988; Parker, personal communication, 1997c). At current fill rates, the Auburn Hills facility is expected to operate as a landfill until 2005.

4.8.4 Traffic and Transportation

Roadways. Detroit Arsenal is served by the same major transportation network that serves the Detroit metropolitan area. Access is provided by Interstate 75 and Interstate 96; State Routes 53, 59, and 102; and U.S. Highway 12. The arsenal is served directly by one freeway, Interstate 696; two adjacent arterials, Van Dyke Avenue (State Route 53) and 12 Mile Road; and two adjacent major collectors, Mound Road and 11 Mile Road (the service road for Interstate 96).

Primary on-post routes include Center Avenue (north-south) and three east-west roads, Arsenal Avenue, Tank Avenue, and North Avenue. Traffic is controlled by several gates including one internal gate.

Existing Traffic Conditions. In 1994, average daily traffic volumes around Detroit Arsenal were estimated for Van Dyke Avenue, Mound Road, 11 Mile Road, and 12 Mile Road to be about 73,000, 58,000, 18,000, and 27,000 vehicles, respectively (MCRC, 1994). A 1991 traffic study conducted in association with partial closure of DATP found traffic volumes in the area, with the exception of Van Dyke Avenue, to be slightly lower (65,000, 45,000, and 43,000 vehicles on Van Dyke Avenue, Mound Road, and 12 Mile Road, respectively) than the 1994 levels. In the 1991 study, Van Dyke Avenue was ranked as having level of service (LOS) F (representing extremely slow traffic speeds), and Mound and 12 Mile Roads were each ranked as having LOS E (representing significant traffic delays and slow speeds). More recent LOS information for the roads and intersections near Detroit Arsenal is not available.

Parking. There is a large parking lot adjacent to the Building 200 complex for automobile parking. In addition, there are medium-sized parking areas located north of Building 215, east of Gate 36, and north of Buildings 229, 230, and 231, as well as several small parking areas spread out across the west side of the arsenal.

Railways. Both Conrail and Grand Trunk Western Line provide rail service to the arsenal. A main Conrail line runs north-south through the center of the arsenal, splitting it into east and west sections. This line continues north to Utica, serving as the primary industrial corridor for Macomb County. The privately operated Conrail line is fully functional and operates approximately 10 trains per day. The east side of the arsenal is connected to the Conrail line by a spur. Current rail use by the arsenal is rare—coal shipments every other year and approximately 275 railcar-carried equipment shipments over the past 3 years (Szymanski, personal communication, 1996). The Grand Trunk Western Line rail passes to the east of the arsenal and connects Detroit to Port Huron-Sarnia. Occasionally, Detroit Arsenal rail service is connected to the National Rail Grid as well as major shipping ports in the cities of Detroit and Port Huron, both of which are situated on shipping channels of the Great Lakes or their tributaries (Parker, personal communication, 1996c).

Public Transportation. The Southeastern Michigan Transportation Authority (SEMTA) provides public transportation service along most major roads in the area. In addition, the Suburban Mobility Authority for Regional Transportation (SMART), Detroit Office of Transportation, and commercial cabs will provide service upon customer request. A SMART bus stop is at the 11 Mile Road security gate, Gate 38. This SMART connector serves the areas to the south side of Administration Buildings 229, 230, and 231. There is, however, no formal agreement in place for this service.

Shipping. Water terminals for ocean shipping are located on the Detroit River, approximately 15 miles southeast of the arsenal. The terminals are approximately 10 miles southwest of Lake St. Clair, which is connected to the St. Lawrence River and eventually flows into the Atlantic, allowing for ocean shipping if needed.

4.8.5 Energy

Electricity. The electrical system at Detroit Arsenal consists of incoming Detroit Edison supply lines, a Detroit Edison-owned electrical substation, Army-owned switch gear, and an underground distribution system. All of the electrical switch gear, the primary transformers, and the substation are located on the east side, but the system services both the east side and the west side of the arsenal.

Electric power is provided via three service lines. Service to the main substation is provided by two 40,000-volt lines coming from the Red Run generating station. The two primary transformers used are rated at 7,500 kilovolt-amperes (kVA) each. Service to the area south of Gate 4 and adjacent to Van Dyke Avenue is provided by one line operated at a rated voltage of 4,800 volts (Giffels Associates, 1997). The existing Detroit Edison electrical substation serving the installation is operating near capacity (3,000 kVA) (HQDA, 1994). In the event of a failure in either of the incoming power lines or transformers, the entire load could be carried on one transformer on an emergency basis. A proposal exists at Detroit Arsenal to upgrade the Detroit Edison electrical substation now serving the installation (Parker, personal communication, 1996b). Prior to disposal of the BRAC parcel, the Army would arrange for construction of a new electrical substation and distribution system for the western portion of the arsenal.

Detroit Arsenal has no continuous electrical generating capabilities, but several emergency generators are on site to protect against loss of external power sources. The major consumers on the arsenal are DATP (accounting for 50 percent of the arsenal's total electrical power consumption) and the propulsion systems laboratory (using 30 percent). Electrical power consumption for the west side of Detroit Arsenal in 1995 was 39,931 megawatt-hours (Parker, personal communication, 1997c).

Coal. The central heating plant (located in the far northwest corner of the BRAC parcel) has five boilers, three coal-fired and two gas-fired. Historically, coal supply for the central heating plant was purchased under Department of Defense (DoD) contract and shipped to the arsenal by rail. Coal use for 1995 was 3,812 tons, down from 11,318 tons in 1985 (Parker, 1996a).

Natural Gas. Natural gas is provided by Consumers Power Company of Warren and purchased through the Defense Fuel Supply Center. A 6-inch-diameter, 45-pounds per square inch (psi) feed line supplies both the west and east sides of the arsenal. A contract limit of 275 million cubic feet per year exists on an uninterruptible basis (Harland Bartholomew & Associates, 1988). Natural gas usage by the west side of Detroit Arsenal for calendar year 1995 was 131 million cubic feet (Parker, personal communication, 1997c). The east side of Detroit Arsenal used natural gas primarily to operate two of the boilers at Building 5.

Steam. The arsenal is heated entirely with steam heat generated by Building 5, the central heating plant, on the east side of the arsenal. A 1985 reliability survey concluded that the heating plant could not be relied on to serve the needs of the arsenal over the next 30 years. In addition, the steam distribution system was found to be in a poor state of repair (Harland Bartholomew & Associates, 1988). Building 5 has been upgraded since 1988 and is in "good" working condition (Parker, personal communication, 1996c). Boilers 1, 2, 3, and 5 are rated at 60,000 pounds of steam per hour at 200 psi pressure; boiler 4 is rated at 75,000 pounds of steam per hour at 200 psi pressure. The total steam use by the west side of Detroit Arsenal in 1995 was 186.6 million pounds. After the BRAC disposal action and closure of the central heating plant, steam will be provided to the west side of Detroit Arsenal by RDA Engineering, Inc. RDA is under contract to provide Detroit Arsenal with a volume of 130,000 pounds per hour (lb/hr) (Parker, personal communication, 1996a). The arsenal will continue to use the central heating plant until RDA Engineering begins to provide steam or until the final deed disposal of Building 5 as part of the BRAC disposal action (whichever occurs first).

4.9 HAZARDOUS AND TOXIC MATERIALS

4.9.1 Generation, Storage, and Disposal

Hazardous waste is generated from painting, degreasing, maintenance activities, and various other operations or processes on the arsenal. Generated wastes include paint-related material, effluent wastewater, waste oil, and miscellaneous hazardous wastes (SAIC, 1996). To ensure efficient handling of hazardous materials, there are seven satellite accumulation points (SAPs) located throughout Detroit Arsenal. Four SAPs are located in Building 200, the central research and development facility; one is located in Building 220; one is located in Building 203; and one is located in Building 215.

Detroit Arsenal is a Resource Conservation and Recovery Act (RCRA) large quantity generator because more than 1,000 kilograms of hazardous waste are generated at the installation each month. Because there is no on-site treatment or disposal of hazardous waste, Detroit Arsenal transports its waste off-site under the USEPA identification number MI5210022781. In 1995, Detroit Arsenal generated 148,788 pounds of hazardous waste.

Hazardous waste is managed in drums. Temporary storage for the waste materials occurs in various locations throughout Detroit Arsenal. On the west side of the arsenal, used oil, waste antifreeze, and paint-related waste drums are stored in five sheds. One shed is located south of Building 219, one east of Building 212, and three east of Building 224. Waste paint and miscellaneous waste from research and development operations are located in two storage sheds west of Building 211. Detroit Arsenal is classified as a 90-day generator, which means hazardous waste cannot be stored on site longer than 90 days (JAYCOR Environmental, 1993, cited in SAIC, 1996; Moore, personal communication, 1997).

Hazardous waste with no salvage value is removed by the Defense Reutilization and Marketing Office or a contractor (Bentley Environmental Services since 1980 for waste paint, contaminated oils, corrosives, and hazardous waste, and American Waste Technology for used filter cakes) and taken to an approved landfill (SAIC, 1996).

4.9.2 Site Contamination

In June 1993, Detroit Arsenal developed a Spill Prevention, Control and Countermeasures Plan and an Installation Spill Contingency Plan. These plans provide a listing of all potential spill sites including all sites that store hazardous substances in reportable quantities as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as well as all oil storage sites in excess of one 55-gallon container. Twenty of these sites are on the west side of the arsenal⁷ (Table 4-3) (Harland Bartholomew & Associates, 1995).

⁷ The Spill Prevention, Control, and Countermeasures Plan is being updated. Various functions have changed locations and new functions have been added. In addition, all PCB transformers have been removed except one in Building 3 on the BRAC parcel (Tighe, personal communication, 1997).

**Table 4-3
Potential Spill Sites at Detroit Arsenal**

Location	Hazardous Material
Building 200A	Graphic art supplies, ammonia
Building 200C	Graphic art supplies, ammonia
Building 200C	Battery acid, halon, radioactive material
Building 200C	Oils, thinners, ketone, other
Building 200D	Metal, paint, oil, solvents
Building 201	Hazardous waste temporary storage, six cells
Building 203	Cleaning supplies, paints, etc. for facility maintenance
Building 203	Any material that comes through shipping
Building 204	Fuel tank storage: diesel, JP-4, gasoline
Building 209	Compressed gas-flammable
Building 211	Oils, solvents, etc.
Building 212	Motor oil, grease, gasoline, kerosene, degreaser
Building 215	Ink solutions, dispersants, hydraulic oil
Building 215	PCB transformers
Building 216	Compressed gas (flammable)
Building 219	PCB transfer
Building 219	Oils, transmission fluid, paints, degreasers
Building 227	Preservation oils, degreasers, polyether
Building 230	Transformers containing PCBs
Building 231	Printer chemicals

Source: TACOM, 1993.

Detroit Arsenal was proposed to be listed on Michigan's State Priorities List (SPL) due to contamination issues associated with DATP. Currently, the site is listed as a Category 3 site for "cleanup actions taken or in progress" (SAIC, 1996). Detroit Arsenal has installed groundwater monitoring wells on location and has performed annual groundwater monitoring at prescribed well points to help alleviate the problem. In addition, TACOM contracted Sverdrup Inc. to prepare a Remedial Action Plan (RAP) for the test track area, the primary area of concern. Sverdrup's summary recommendation was for no further action due to low migration rates and groundwater sampling results showing only trace levels of contaminants (Parker, personal communication, 1997b).

4.9.3 Other Hazardous or Toxic Substances

Other toxic or hazardous substances identified at the arsenal include asbestos, lead, polychlorinated biphenyls (PCBs), radon, radionuclides, and pesticides.

Asbestos. Excluding Building 212, a thorough series of asbestos surveys has been conducted at the arsenal over the last 10 years. Several buildings containing friable asbestos-containing material (ACM) were identified, but any identifiable ACM was remediated (Parker, personal communication, 1997c).

The installation has an Asbestos Management and Control Program to monitor ACM found in buildings. The base service contractor, Raytheon, is using this plan as part of its contract maintenance requirements to monitor, abate, and remove asbestos for the west side of the arsenal (JAYCOR Environmental, 1993, cited in SAIC, 1996).

Lead. Surveys have confirmed the presence of lead-based paint (LBP) at Detroit Arsenal. With the exception of newly constructed Buildings 210 and 234 and the Mound Road guard shack, LBP was positively identified in all buildings surveyed. Investigation and abatement are conducted on a case-by-case basis as maintenance or refurbishment work requires the removal of paint. In addition, lead-based paint is not currently stored on site (Parker, personal communication, 1997c).

Polychlorinated Biphenyls (PCBs). There is no equipment that contains PCBs on the west side of Detroit Arsenal.

Radon. In 1989 and 1990, an extensive radon survey was performed at Detroit Arsenal. Radon detection data indicated that all buildings have levels that average below the USEPA permissible average, 4 picocuries per liter (pCi/L) (HQDA, 1992, cited in SAIC 1996; Parker, personal communication, 1996c).

Radionuclides. The amount of radioactive materials on the west side of the arsenal has decreased in recent years due to cleanup efforts in Building 200C and the Room 1042B Rad Lab, and due to radioactive waste shipments to disposal sites. Radioactive sources have been identified on the west side of the arsenal—one wooden box containing three radioactive check sources located in Building 200A, and a radioactive storage area storing an M1 Tank Muzzle Reference Sensor in Building 201. In addition, there are tritium (radioactive) components in the exit light fixtures located in Building 4 and 23. Historically (on the east side of the arsenal), General Dynamics Land Systems (GDLS) managed the radioactive materials on the completed tanks in storage under Army permit P21-212106801-DATP (expiration January 31, 2000) and Nuclear Regulatory Commission (NRC) license 21-21068-01 (expiration March 31, 2000). These radioactive materials include tritium, thorium, cesium, nickel, and depleted uranium sources (SAIC, 1996). GDLS also managed radioactive components not on completed tanks, as long as they were under their control.

Building 200C is currently under a research and development (R&D) Nuclear Regulatory Commission (NRC) permit that allows for a broad spectrum of radioactive materials. This area is

currently being phased out. All of the radioactive materials have been removed, and the contaminated areas have been fully decontaminated. The license for Building 200C and Building 5 (on the east side of the arsenal) is 21-01222-02, and it has an expiration date of July 31, 2005. In any other areas that might have had licenses/permits, such licenses/permits have been terminated and the areas released for unrestricted use (Parker, personal communication, 1997c).

Unexploded Ordnance (UXO). There is no known UXO on Detroit Arsenal (Parker, personal communication, 1997c).

Pesticides. Pesticides are used in small quantities throughout Detroit Arsenal. They are applied by DoD-certified applicators working for the base support contractor, Raytheon Services Corporation. The types used are organophosphates, botanicals, herbicides, carbamates, and *Bacillus thuringiensis*; the forms used are granular, solid, and liquid. Approximately 90 percent of pesticides used in 1995 were spot-applied to cracks and crevices (Parker, personal communication, 1997c).

Aboveground and Underground Storage Tanks. A total of 14 existing underground storage tanks (USTs) and aboveground storage tanks (ASTs) from both sides of Detroit Arsenal are currently registered with the Michigan Department of Environmental Quality (MDEQ). There are three USTs on the west side of Detroit Arsenal (see Table 4-4), and three more USTs will be installed to replace storage capacity for the fuel farm previously located on the DATP parcel. As of June 1997, there were four aboveground storage tanks located in Buildings 232N, 205S, 212N, and 229 on the west side of the arsenal. All ASTs are reported to be in excellent condition. Two new ASTs are planned to be installed to support fuel requirements for the tactical fleet, as well as vehicles and equipment that do not operate off the installation.

4.10 PERMITS AND REGULATORY AUTHORIZATIONS

Permits, licenses, and authorizations currently in effect at the arsenal cover a wide range of operations. All environmental permits are registered to TACOM.

Table 4-4
Existing Underground Storage Tanks

Location	Tank Number	Capacity	Contents	Date of Installation
Building 215	215	2,000	Used hydraulic oil	1986
Building 212	212N	1,000	Water and used oil	1990
Building 212	212S	500	Waste and used oil	1957

Source: Harland Bartholomew & Associates, 1995.

4.10.1 Air

There are two permitted air sources on the west side of the arsenal. The permitted point sources pertain to engine test cell exhaust in Building 212 and a carpenter shop in Building 203. The relevant air pollutants are NO_x and CO, and airborne particulate matter, respectively. Table 4-5 contains the locations, related operations, control equipment, and pollutants generated from the current permitted sources.

Detroit Arsenal is preparing a Federally Enforceable State Operating Permit application for submission to MDEQ. Approval of the application will qualify the arsenal as a synthetic minor source.⁸ Detroit Arsenal should be eligible for this designation due to its current plans to obtain heat off site from RDA Engineering, Inc. RDA is under contract to provide Detroit Arsenal with a volume of 130,000 lb/hr (Parker, personal communication, 1997c).

4.10.2 Water

Detroit Arsenal holds National Pollutant Discharge Elimination System (NPDES) permits for the discharge of wastewater for storm water and noncontact cooling water and an industrial wastewater pretreatment permit.

NPDES general permit MIG250000 is for the air-conditioning condensate being discharged from Building 4 (east side of the arsenal); the frequency for monitoring remained as established in the previous individual NPDES permit, MI0041661. This permit was issued by MDEQ on August 23, 1994, and will expire on October 1, 1998. Detroit Arsenal received authorization to discharge under permit MIG250000 with the approval of Certificate of Coverage MIG250053 on February 5, 1996. Under Certificate of Coverage MIG250053, Detroit Arsenal is authorized to discharge 0.7 mgd of noncontact cooling water to Bear Creek. In addition, Detroit Arsenal must adhere to monitoring requirements previously approved under NPDES permit MI0041661 (City of Warren, 1994).

Table 4-5
Permitted Air Sources

Location	Source	Control Equipment	Target Pollutant
Building 203	Carpenter shop	Cyclone collector	Airborne particulate
Building 212	Engine test cell exhaust	None	NO _x , CO

Source: JAYCOR Environmental, 1993, cited in SAIC, 1996.

⁸ A Synthetic Minor Permit entails restrictions on operations such that an otherwise major stationary emission source is permitted as a minor emission source. A minor source does not have to undergo an extensive permitting process to obtain a permit to operate.

Detroit Arsenal also has an NPDES storm water general permit, MIR000000 (Certificate of Coverage MIR11D027), for storm water discharges to Bear Creek/Red Run River/Clinton River. The permit was issued by MDEQ on March 22, 1995, and requires the arsenal to have a storm water certified operator by March 22, 1996, and a Storm Water Pollution Prevention Plan by September 22, 1996. In addition, Detroit Arsenal had to complete implementation of the nonstructural provisions of the storm water plan by March 1997. In consultation with state regulators, the arsenal is taking action to come into compliance with these regulations. The storm water permit expires on January 31, 1999 (City of Warren, 1994).

The arsenal's sanitary sewer system discharges to the city of Warren sewage treatment plant are regulated under Industrial User Discharge Permit 401204. The permit was approved in 1994 for significant industrial users from the city of Warren and covers categorical discharges based on the permit limits for pollutants such as hexavalent chromium (0.5 milligrams per liter [mg/L]), oil and grease (100 mg/L), and pH (above 5.0). The permit was renewed in June 1997 and is scheduled to expire on April 15, 1999 (City of Warren, 1994, 1997).

4.10.3 Hazardous Waste

Hazardous wastes on the installation are disposed of using the USEPA identification number MI5210022781. The eastern and western portions of the arsenal share the same USEPA ID number.

4.10.4 Underground Storage Tanks

A total of 24 USTs from both sides of Detroit Arsenal have been registered with MDEQ. Eleven of the USTs are located on the west side of the arsenal. They are being used to store water, used oil, and used hydraulic oil. The USTs are registered with the Hazardous Materials Section/Fire Marshal Division of MDEQ under Facility No. 0-021669 (SAIC, 1996).

4.11 BIOLOGICAL RESOURCES AND ECOSYSTEMS

The U.S. Fish and Wildlife Service (USFWS) and the Michigan Department of Natural Resources (MDNR) were consulted regarding sensitive species and habitat issues. Neither agency reported the presence of threatened or endangered species or sensitive habitat on Detroit Arsenal. Copies of the response letters are provided in Appendix A.

4.11.1 Vegetation

Most of Detroit Arsenal is highly urbanized, leaving little room for vegetation. A few undeveloped areas on the installation contain grasses such as Kentucky bluegrass (*Poa pratensis*), fine fescue (*Festuca* sp.), and rye (*Secale* sp.). Some trees and shrubs are scattered along the perimeter of the arsenal. These tree species include Norway maple (*Acer platanoides*), red maple (*Acer rubrum*), ash (*Fraxinus* sp.), Norway spruce (*Picea abies*), Colorado blue spruce (*Picea pungens*), Scotch pine (*Pinus australis*), Austrian pine (*Pinus nigra*), crabapple (*Pyrus baccata*), pin oak (*Quercus palustris*),

and cedar (*Cedrus* sp.). Ground cover at the proposed location for construction of the warehouse is a mixture of grass and weeds that is mowed periodically.

4.11.2 *Wildlife*

Given the developed nature of the arsenal, almost no wildlife is found except for species common to residential and urban areas. These species include rabbits (*Sylvilagus* sp.), ducks (*Anas* sp.), geese (*Branta* sp.), and sea gulls (*Larus* sp.).

4.11.3 *Sensitive Species*

Records from both the USFWS and MDNR indicate that there are no known occurrences of federally or state-listed species, natural plant communities, or natural features on the arsenal (Eitniear, personal communication, 1997; Sargent, personal communication, 1997).

4.11.4 *Wetlands*

Although it has been identified that slow drainage exists on the installation, no areas have been classified as wetlands (Harland Bartholomew & Associates, 1995; USACE, 1994).

4.12 *CULTURAL RESOURCES*

4.12.1 *Background*

Prehistory. The region of Michigan in which Detroit Arsenal is located is known to have been inhabited by various Native American cultures for more than 13,000 years. Cultural stages and periods for the lower peninsula of Michigan are Paleo-Indian (11,000 to 8000 B.C.), Archaic (8000 to 1000 B.C.), Woodland (1000 B.C. to 1600 A.D.), and Protohistoric/Contact (1600 to 1700 A.D.). The various Native American cultures in Michigan can be identified by changes in projectile point types, pottery, subsistence patterns, housing, and ceremonial artifacts and places. Prehistoric settlement and subsistence patterns for this area were determined largely by changing water levels initially as a result of the retreat of the glacial ice sheet at the end of the Pleistocene period and later as a result of the stabilization of water levels in riverine and lacustrine environments. The stabilization of the water levels coincides with a change from predominantly hunting and gathering societies to predominantly horticultural societies during the Woodland Period (Weitze, 1996).

History. European contact in the Great Lakes region was initiated by French explorers and fur traders during the 17th century. Southeastern Michigan appears to have been largely abandoned by the Indians between 1450 and 1700, possibly due to the creation of the Iroquois Confederacy, but it was resettled after the founding of French trading posts at Port Huron (Fitch and Glover, 1989, cited in Weitze, 1996). Detroit was founded in 1701, but European settlement in the region remained limited. In the Treaty of Detroit signed in 1807, Native Americans gave up their claims to most of the region and Euro-American settlement began in earnest (Weitze, 1996). Various Native American groups,

including the Chippewa, Ottawa, Wyandot, Potawatomi, and Kickapoo, had occupied the region before complete Euro-American settlement (Center for American Archeology, 1985).

The built environment of Detroit Arsenal is composed of buildings and structures that span the World War II era (1941 to 1945) and the Cold War era (post-1945). Military operations at the arsenal began in August 1942 when the tank plant was built on the east side by the Chrysler Corporation to produce tanks for the war effort (Weitze, 1996). Before construction of the facility, Detroit Arsenal was agricultural land. The initial development of the west side of the arsenal, where the BRAC action is to occur, was begun in the early to mid-1950s. The west side of Detroit Arsenal is devoted to research and development activities associated with the Army's work on tank and automotive materiel (Weitze, 1996).

4.12.2 Previous Historic Resource Investigations/Section 106 Consultations

Historic Architectural Investigations. In 1984 an inventory/assessment of architectural resources was conducted by Building Technology, Inc. The resulting report made a number of recommendations concerning the eligibility of Detroit Arsenal buildings for the National Register of Historic Places. A later study conducted in 1992 by the U.S. Army Corps of Engineers, Fort Worth District, recommended that several buildings on the east side (BRAC disposal parcel) were eligible for the National Register. A concurrence determination for eligibility for the National Register was received for Buildings 1, 2, 3, 4, 5, 7, 8, and the Tank Test Track Bridge from the Michigan State Historic Preservation Officer (SHPO) on March 11, 1997. The Army is currently in consultation with the SHPO and Advisory Council on Historic Preservation (ACHP) for final disposition of the BRAC disposal parcel and its eligible structures (Austin, personal communication, 1997a).

Only one structure on the west side of the arsenal, Building 212, is considered eligible for the National Register based on a 1994 finding by the U.S. Army Corps of Engineers. The Michigan SHPO has concurred that the structure is National Register-eligible (Austin, personal communication, 1997b).

Archeological Investigations. There are no known archeological sites on Detroit Arsenal. A 1985 reconnaissance of the arsenal indicated that the overall potential for intact archeological resources within the boundaries of the facility was low. Construction activities since 1940, including both the disturbance of upper soil layers and the addition of areas of fill, are the primary basis for the interpretation (Weitze, 1996).

Historical maps from 1875 and 1895 record six farmsteads within the west side of Detroit Arsenal's boundaries. Detroit Arsenal property acquisition maps from 1950 further record two of these farming complexes, inclusive of outbuildings, in detail along 11 Mile Road on the south side of the installation. Preservation for the farmstead sites is considered to be minimal due to ground disturbance caused by construction of the arsenal (Weitze, 1996).

The Army has determined that the proposed construction site for the warehouse has been too badly disturbed by past construction activities to possess intact archeological remains. A determination that the proposed warehouse construction site has no archeological potential is being coordinated with the Michigan SHPO's office.

4.13 ECONOMIC DEVELOPMENT

This section describes the contribution of Detroit Arsenal to the economy and sociological environment in the region. The socioeconomic indicators used for this study include population, regional economic activity, housing, and schools. In addition, recreational and community facilities, and public and social services are discussed. These indicators characterize the region of influence (ROI).

An ROI is a geographic area selected as a basis on which social and economic impacts of project alternatives are analyzed. The criteria used to determine the ROI are the residency distribution of Detroit Arsenal employees, commuting distances and times, and the location of businesses providing goods and services to Detroit Arsenal, its personnel, and their dependents. Based on these criteria, the ROI for the social and economic environment is defined as Macomb, Oakland, and Wayne counties in Michigan. The ROI covers an area of 1,967 square miles and includes much of the Detroit metropolitan area.

The baseline year for socioeconomic data is 1995, the year of the BRAC Commission's announcement of the Detroit Arsenal realignment. This base year represents the most recent fiscal year in which Detroit Arsenal staffing and operations were conducted under "normal" conditions. Where 1995 data are not available, the most recent data available are presented.

4.13.1 Regional Economic Activity

The Detroit area has been called the "automotive capital of the world," and automotive and automobile-related manufacturing is an important part of the regional economy. The three largest employers in the ROI are automobile manufacturers (Table 4-6). However, the economy has shifted away from its traditional dependence on manufacturing, and the service industry is the largest source of jobs in the region (Table 4-7).

In 1994, the service sector provided 31.3 percent of the jobs in the area, while manufacturing accounted for 19.3 percent. Retail and wholesale trade and government were also important sources of employment, accounting for 22.6 percent and 10.3 percent of jobs, respectively.

The ROI labor force totaled 1,941,354 in 1995, and the unemployment rate was 4.6 percent. This was a marked improvement from the 7.4 percent unemployment in the region in 1990.

Per capita income in the region increased by more than 20 percent between 1990 and 1994, reaching \$25,109 in the latter year. The average per capita income in the United States was \$21,969 in 1994, an increase of 16.2 percent since 1990.

Table 4-6
Major Employers in the ROI

Employer	Number of Employees
GM Corporation	60,058
Ford Motor Company	37,819
Chrysler Corporation	26,110
Michigan Department of Military Affairs	8,542
St. John Health System	7,500
William Beaumont Hospital	7,500
Northwest Airlines, Inc.	7,200
Comerica Bank	5,708
City of Detroit Police Department	4,700
American Axle & Manufacturing	4,400

Source: Greater Detroit Chamber of Commerce, 1996.

Table 4-7
ROI Employment by Industry

Employment Sector	1990 ROI Employment (Percent of Total Employment)	1994 ROI Employment (Percent of Total Employment)
Services	613,232 (29.0)	676,613 (31.3)
Wholesale and Retail Trade	487,795 (23.1)	488,125 (22.6)
Manufacturing	421,698 (20.0)	417,819 (19.3)
Finance Insurance and Real Estate	167,755 (7.9)	165,019 (7.6)
Transportation and Public Utilities	90,808 (4.3)	89,683 (4.2)
Construction	80,513 (3.8)	82,550 (3.8)
Other Nonfarm Private Sector	13,615 (0.6)	15,732 (0.6)
Government and Government Enterprises	235,381 (11.1)	222,073 (10.3)
Total Nonfarm Employment	2,110,797	2,157,614
Farm Employment	2,787	2,752
Total Employment	2,113,584	2,160,366

Source: U.S. DOC, BEA, 1996.

4.13.2 Installation Contribution, Local Expenditures

Detroit Arsenal's estimated local nonsalary (operational) expenditures are more than \$500 million per year. This figure reflects expenditures for utilities, services, supplies, construction, and operations but does not include expenditures for technical procurements (Parker, personal communication, 1997d).

4.13.3 Installation Workforce Structure and Salaries

Detroit Arsenal employed 4,194 persons in 1995. Average annual salaries of military and civilian personnel total approximately \$181 million. Salary information specific to personnel levels is not available (Parker, personal communication, 1997d).

4.14 SOCIOLOGICAL ENVIRONMENT

4.14.1 Demographics

Population characteristics in the ROI are provided for the baseline year of 1995 or the most recent year for which data are available. Table 4-8 presents the population changes within the ROI between 1980 and 1995, as well as projections through 2010.

In 1995, the ROI population totaled 3,942,568, an increase of less than 1 percent since 1990. The ROI population decreased 3.5 percent between 1980 and 1990, as a result of declining population in Wayne County. Although the population of Wayne County is expected to continue to decline, the ROI

Table 4-8
ROI Population Trends

	Population 1980	Population 1990	Population 1995	Population 2000 (projected)	Population 2005 (projected)	Population 2010 (projected)
Macomb County	694,600	718,611	733,607	776,600	802,800	832,800
Oakland County	1,011,793	1,086,695	1,153,461	1,192,400	1,232,500	1,272,600
Wayne County	2,337,843	2,108,969	2,055,500	2,053,100	2,019,000	1,990,800
Total ROI	4,044,236	3,914,275	3,942,568	4,022,100	4,054,300	4,096,200

Source: Greater Detroit Chamber of Commerce, 1996; U.S. DOC, Census, 1994, 1996.

population as a whole is projected to increase slowly as a result of growth in Oakland and Macomb counties.

4.14.2 Housing

On-Base Housing. There is no on-base housing currently in use at Detroit Arsenal.

Off-Base Housing. There were approximately 1,540,000 housing units in the ROI in 1990, 95 percent of which were occupied, as shown in Table 4-9.

4.14.3 Public Services

Law Enforcement Services. Security for Detroit Arsenal is provided by a DoD police department. Fourteen police officers and eighteen guards provide guard service, personnel security, vehicle registration and safety, traffic control, and visitor control (Thorne, 1996).

Fire Protection Services. Fire protection for Detroit Arsenal is provided by a DoD fire department. Sixteen fire department personnel provide standard fire protection services. The fire department is part of the South Macomb Incident Response Team (SMIRT), which responds to hazardous materials incidents. Mutual aid is provided through the Macomb County Mutual Aid agreement. It includes all fire departments throughout Macomb County. Mutual aid fire departments include Warren, Harper Woods, East Pointe, Roseville, and St. Claire Shores (Tighe, personal communication, 1997).

Medical Services. A clinic with a staff of three is located on the installation. A total of 48 hospitals in the ROI provide more than 14,500 beds (Greater Detroit Chamber of Commerce, 1996). In

Table 4-9
ROI Housing Quantity and Quality

	Macomb County	Oakland County	Wayne County	ROI
<i>Quantity</i>				
Total housing units	274,843	432,684	832,710	1,540,237
Occupied housing units	264,991	410,488	780,535	1,456,014
Owner-occupied	204,609	298,377	798,682	1,001,668
Renter-occupied	60,382	112,111	281,853	454,346
Vacant housing units	9,852	22,196	52,175	84,223
<i>Quality</i>				
Homeowner vacancy rate	1.1%	1.4%	1.0%	1.1%
Rental vacancy rate	7.1%	7.6%	7.5%	7.5%
Lacking complete plumbing facilities	0.2%	0.3%	0.6%	0.4%
Lacking complete kitchen facilities	0.4%	0.3%	1.0%	0.7%

Source: U.S. DOC, Census, 1992.

No changes to air quality would be expected as a result of the use of employee vehicles (primarily consisting of commuting to and from work), but overall air quality around the arsenal would be expected to improve due to the closure of the east side of the installation. Although total personnel levels would remain the same and require the same amount of vehicle trips, closure of Buildings 4 and 5 on the east side of the arsenal will reduce airborne contaminants originating at the arsenal.

A Record of Non-Applicability (Appendix B) demonstrates that emissions of carbon monoxide would be below threshold levels requiring an air quality conformity determination.

No indirect effects would be expected.

5.5 **NOISE**

Direct short-term minor adverse effects would be expected. Noise generated during construction/renovation activities would be temporary and intermittent and would likely affect only employees working in facilities adjacent to construction areas. Construction activities would be limited to daylight hours when they would be least likely to affect neighboring residential areas. Activities being realigned to the arsenal would not produce noise. The combination of heavy and light-duty delivery vehicles that previously transited Central Avenue and entered DATP at Gate 31 while en route to delivery destination points at DATP would travel the full length of Central Avenue to the new warehouse. Vehicle noise associated with deliveries of supplies and materiel would change from DATP to the northern portion of the west side of Detroit Arsenal. This noise associated with truck traffic in the northwest corner of the arsenal would not have any adverse impact to off-site residents based on the commercial and light industrial nature of the area. Altogether, no appreciable increase in traffic-related noise at Detroit Arsenal would be expected. No indirect effects would be expected.

5.6 **GEOLOGY**

No direct or indirect effects on structure, stratigraphy, or topography are expected from the proposed action. Direct short-term and long-term minor adverse effects on soils would be expected. Soils in the immediate vicinity of the renovation and construction projects would be disturbed through excavation, grading, and removal. Clearing of vegetation prior to construction would also expose soils to potential erosion. However, the use of best management practices during and after construction, such as installing sediment and erosion fences, would reduce the potential for soil loss.

The Toledo silty clay loam and the Lenawee clay loam have moderate to high limitations for building development due to the presence of shrink-swell clays. Construction associated with the proposed action in areas where shrink-swell clays occur would require special geotechnical engineering. Because the nature of the soils is uncertain due to past drainage, excavation, and filling, site-specific characterization of soils should be conducted before construction. The removal of shrink-swell soils and their replacement with fill might be required before construction could occur, resulting in minor adverse environmental effects on natural soil conditions in these areas.

The Toledo silty clay loam and the Lenawee clay loam also have limitations associated with high water tables and poor stability. Before building on these soils, special geotechnical engineering would be required in areas not previously drained. Artificial drainage would be necessary under certain

construction scenarios. Drainage of soils prior to construction would have long-term minor adverse environmental effects on the natural hydrologic and structural characteristics of the soils and would adversely affect vegetation associated with the soils.

No indirect effects on soils would be expected.

5.7 **WATER RESOURCES**

Direct long-term minor adverse effects would be expected. Construction of the proposed 50,000-square-foot warehouse would affect surface water due to an increase of impervious surfaces and associated runoff. Relative to the moderate degree of development along Bear Creek, the principal recipient of Detroit Arsenal surface water runoff, the incremental amount of impervious surface runoff contributed by the proposed construction would be minor. Use of erosion and sediment controls during construction would substantially reduce or avoid short-term minor adverse effects on surface waters.

No indirect effects would be expected.

5.8 **INFRASTRUCTURE**

Potable Water Supply. No direct or indirect effects on potable water supply would be anticipated as a result of the proposed action. Overall, the amount of potable water supplied to the arsenal is expected to decrease due to the closure of the east side of the installation. Since there would be no net increase in personnel, the current demand for potable water would be expected to remain the same. The existing water supply is in good condition and is sufficient for maintaining the water supply demand at the arsenal.

Wastewater Treatment. No direct or indirect effects on wastewater treatment would be expected as a result of the proposed action. Overall, wastewater levels at the arsenal are expected to decrease due to the closure of the east side of the installation. The arsenal's sewer system is in good condition and would continue to discharge to the city of Warren, which would continue to treat the arsenal's wastewater.

Solid Waste Disposal. No direct or indirect effects on solid waste disposal would be expected as a result of the proposed action. There would be no change in the types of solid waste generated by the proposed action. Overall, solid waste levels at the arsenal are expected to decrease due to the closure of the east side of the installation.

Traffic and Transportation. No direct or indirect effects on traffic or transportation would be expected as a result of the proposed action. New roadways would not be required for the proposed action. Renovation activities and construction of the new facilities would cause a temporary minor increase in the volume of truck traffic. The increase in truck traffic would be negligible compared to the existing volumes in the area.

No changes in daily traffic volume would be expected as a result of the proposed action. Since there would be no net increase in personnel, the current traffic volume would be expected to remain the same.

No changes in rail traffic would be expected as a result of the proposed action.

Energy. No direct or indirect effects on energy resources would be expected as a result of the proposed action. A slight increase in electrical consumption would be anticipated for the west side of the arsenal, but overall electrical consumption at the arsenal would be expected to decrease due to the closure of the east side of the installation.

No additional coal would be required by the arsenal. Coal supplies were used solely by the east side of the installation.

A negligible increase in natural gas consumption on the west side of the arsenal would be expected as a result of the proposed action. Overall, natural gas consumption at the arsenal would be expected to decrease due to the closure of the east side of the installation.

No adverse effects on steam supplies would be anticipated as a result of the proposed action. Steam would be provided by the new RDA Engineering facility located adjacent to the arsenal property. This facility would provide a volume of 130,000 lb/hr of steam to the arsenal, which is enough steam to support all activities on the west side of the arsenal.

5.9 **HAZARDOUS MATERIALS AND HAZARDOUS WASTES**

Permanent increases in the amount of hazardous and toxic waste generated at Detroit Arsenal due to the proposed action would not be expected. Hazardous and toxic material generation at the arsenal would be expected to decrease as a whole due to the closure of DATP. Procedures for the disposal of hazardous wastes generated at Detroit Arsenal would not be affected by the proposed action. No underground storage tanks are located near the proposed construction site.

If any asbestos, LBP, or PCBs were encountered during construction or renovation activities, appropriate steps would be taken to ensure safe handling, removal, and disposal of the substance.

Asbestos. No direct or indirect effects would be expected. Asbestos would continue to be subject to management by Detroit Arsenal personnel to ensure that damaged or deteriorated ACM would be removed or encapsulated in a timely manner. Should any material containing friable asbestos be encountered during renovation activities, appropriate steps would be taken to ensure the safe handling, removal and disposal, or encapsulation of the substance.

Radon. No direct or indirect effects would be expected.

Lead-based Paint. No direct or indirect effects would be expected. Previous surveys for LBP indicate that it occurs in most of the buildings on the west side of the arsenal. To reduce the chance of increased exposure to LBP as a result of renovation activities, construction personnel would be provided with appropriate respiratory equipment and would follow all state and federal procedures for handling LBP.

Polychlorinated Biphenyls. No direct or indirect effects on or from PCB-containing materials would occur as a result of the proposed action.

Potential Spill Sites. Six of the facilities to which personnel and functions would relocate (Buildings 200A, 200D, 203, 212, 230, and 231) are listed in the *Spill Prevention Control and Countermeasures Plan and Installation Spill Contingency Plan for Detroit Arsenal* (June 1993) as potential hazardous materials spill sites. Hazardous materials which the personnel could encounter in the facilities to which they would relocate are listed in Table 4-4. In accordance with the June 1993 plan, all employees who are assigned to work at any of these potential spill sites are required to attend annual installation spill contingency plan briefings. The briefings emphasize that the initial response action to any spill situation is to protect personnel from harm. Moreover, personnel are instructed to stop the flow of material if protected from harm, to contain the spill if feasible, and to notify appropriate individuals as detailed in the plan.

5.10 PERMITS AND REGULATORY AUTHORIZATIONS

No direct or indirect effects would be expected. Existing operating permits and authorizations for activities on Detroit Arsenal would continue. Operations would likely continue below the limits of the permits due to the closure of DATP and the subsequent disposal of the eastern portion of the installation. Existing permitting and enforcement mechanisms of federal, state, and local agencies would provide assurance against contamination of environmental media and would be protective of human health and the environment.

5.11 BIOLOGICAL RESOURCES

No direct or indirect effects would be expected. Virtually no wildlife habitat occurs on Detroit Arsenal, and proposed construction or renovation activities would have a negligible effect on the urban-adapted species now present. The proposed action would result in permanent removal of grass and weeds for the construction of the 50,000-square-foot warehouse facility; however, this loss would not be considered adverse because the vegetation is already highly disturbed.

5.12 CULTURAL RESOURCES

No direct or indirect effects on cultural resources would be expected as a result of proposed BRAC 95 construction and renovation projects. It has been determined that the site of the proposed warehouse was previously disturbed and does not have the potential to possess intact archeological resources. The Michigan SHPO concurred with this determination (see Appendix A).

Although Building 212 has been determined to be eligible for the National Register of Historic Places, the proposed realignment of the TARDEC Meteorology and Calibration Laboratory into the building would have no effect on this architectural resource since no renovations are planned for the building. New personnel would occupy existing spaces within Building 212.

5.13 ECONOMIC DEVELOPMENT

Methodology. Socioeconomic effects of the implementation of the preferred alternative were estimated using the Economic Impact Forecast System (EIFS) model (USACERL, 1994). The EIFS model is a computer-based economic tool that calculates multipliers to estimate the direct and indirect effects of the action, and any effects of construction. Based on the input data and calculated multipliers, the model estimates ROI changes in sales volume, employment, income, population,

housing, and school enrollments, accounting for the direct and indirect effects of the action. Appendix C describes the EIFS model in more detail and presents the model input and output tables.

The analysis uses the social and economic indicators presented in Sections 4.12 through 4.14. The EIFS model outputs represent net changes in sales volume, employment, income, population, housing, and schools.

For purposes of this analysis, a change could be considered significant if it falls outside the normal range of ROI economic variation. To determine historical variability, the EIFS model calculates a rational threshold value (RTV) profile for the ROI. This analytical process uses historical data for the ROI and calculates fluctuations in sales volume, employment, income, and population patterns. The historical extremes for the ROI become the threshold of significance for social and economic change. If the estimated effect of a scenario falls outside the RTVs, the effect is considered significant. Appendix C discusses this methodology in more detail and presents the model output tables developed for this analysis.

Direct short-term minor beneficial effects would be expected from construction. A total of 22 direct jobs would be created, generating \$458,000 in additional income in the ROI. The sales volume in the ROI would increase by \$3,660,000 as a result of direct spending (Table 5-1). These increases would be temporary as a result of the short-term nature of construction.

There would be no operational effects. Because all employees would be relocated from DATP, they are included in the Detroit Arsenal baseline employment.

Indirect short-term minor beneficial effects would also be expected from construction. Total employment (direct and indirect) would increase by 106 jobs, while the total income of the ROI would increase by \$2,935,000. Total sales volume would increase by \$11,108,000 as a result of direct and indirect spending associated with construction, and net government revenues would increase by \$80,000. These temporary increases would fall within historical fluctuations and be considered minor.

5.14 *SOCIOLOGICAL ENVIRONMENT (Including Environmental Justice and Protection of Children)*

No direct or indirect effects would be expected. There would be no change in population, and therefore no change to the housing market. All public services provided at the Detroit Arsenal would remain at the same level. There would be no disproportionate effects on minority populations, low-income populations, or children.

Table 5-1
EIFS Construction Model Output for the Detroit Arsenal Realignment

Indicator	Projected Change	Percentage Change	RTV Range
Direct Sales Volume	\$3,660,000	N/A	N/A
Total Sales Volume	\$11,108,000	0.008	-9.464% to 8.414%
Direct Employment	22	N/A	N/A
Total Employment	106	0.005	-4.762% to 5.611%
Direct Income	\$458,000	N/A	N/A
Total Income	\$2,935,000	0.003	-5.469% to 7.683%
Local Population	0	0	-0.536% to 0.656%
Local Off-base Population	0	N/A	N/A
Number of School Children	0	N/A	N/A
Demand for Housing		N/A	N/A
Rental	0	N/A	N/A
Owner-Occupied	0	N/A	N/A
Total Housing Demand Increase	0	N/A	N/A
Government Expenditures	\$160,000	N/A	N/A
Government Revenues	\$240,000	N/A	N/A
Net Government Revenues	\$80,000	N/A	N/A
Civilian Employees Expected to Relocate	0	N/A	N/A
Military Employees Expected to Relocate	0	N/A	N/A

Note: N/A = not applicable.

Source: EIFS model.

5.15 **QUALITY OF LIFE**

No direct or indirect effects would be expected. Construction of a 50,000-square-foot warehouse would not be expected to affect visual and aesthetic values. The construction would be in accordance with the installation design guide used by Detroit Arsenal to obtain consistent architectural style and appearance among the buildings on the installation. To the north of the installation are commercial

properties. The addition of the warehouse at the proposed site, visible from off the installation, would not be inconsistent with the visual and aesthetic qualities of the immediate area.

5.16 INSTALLATION AGREEMENTS

No direct or indirect effects would be expected. Installation agreements would not require additions or modifications as a result of implementation of the proposed action.

5.17 CUMULATIVE EFFECTS

A cumulative effect is an effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions, regardless of the agencies or parties involved. Cumulative effects can result from individually minor but collectively substantial factors taking place over time as they relate to the entire installation and ROI.

Past BRAC actions have affected the Detroit Arsenal. Recommendations of the 1993 BRAC Commission resulted in disestablishment of the Belvoir Research, Development, and Engineering Center and relocation of several of its functions to Detroit Arsenal. To support that action, Detroit Arsenal constructed a 38,000-square-foot Mobility Center Laboratory to house personnel and functions relocated from Fort Belvoir. Recommendations of the 1995 BRAC Commission resulted in the disestablishment of the Aviation-Troop Command in St. Louis, Missouri, and relocation of that organization's automotive materiel management function to Detroit Arsenal to align with the Tank-automotive and Armaments Command. These relocations have increased by approximately 300 the number of personnel assigned to Detroit Arsenal.

In addition to the past actions, there are two potential sources of factors that would contribute to cumulative effects in relationship to the proposed action. The first of these sources relates to the disposal and reuse of DATP. As shown in the community's reuse planning for DATP, there would be substantial redevelopment at DATP following disposal. The community's preferred alternative for reuse involves the demolition of all structures and improvements, new construction of primarily mixed commercial facilities, and new construction of roadways and access on and into the 153-acre site. Over a build-out period of as long as 20 years, the DATP site could be redeveloped to achieve a workforce estimated at 6,400 employees.

The second potential source of cumulative effects relates to presently known development projects in Warren and Macomb County. The principal projects among the 63 known are identified in Section 4.2.5. These projects represent the investment of several hundred millions of dollars and the retention and creation of jobs. They also represent numerous additional demands on environmental resources and outputs affecting environmental resources areas such as noise, air quality, and water quality.

There are few connections (proponents, time frames for execution of projects, or locations) between the proposed action and those described in Section 4.2.5. Their similarity lies in the retention of jobs within the ROI. The combination of the proposed action, redevelopment of DATP, and the other development projects would be anticipated to result in minor adverse effects due to greater overall mobile source air emissions and slightly increased demands on energy and water. Transportation could also be somewhat adversely affected in the vicinity of the Detroit Arsenal in a cumulative sense due, primarily, to the concentration of new employment opportunities at the DATP site. The planned

efforts on the part of the Macomb County Road Commission and Southeast Michigan Council of Governments to alleviate traffic congestion through efficient and effective project planning and construction programs would be expected to occur throughout the duration of all the expected actions, resulting in minimization of potential adverse effects (see Section 4.2.5). In the immediate vicinity of the Detroit Arsenal, there could be slightly increased noise levels, especially along the Van Dyke Avenue transportation corridor. Increased noise levels, which would be expected to arise over the course of redevelopment of the DATP site, would be only negligibly related to traffic and transportation-related noise at Detroit Arsenal.

5.18 MITIGATION SUMMARY

Mitigation actions associated with the construction of the new warehouse facility and the renovation of several existing buildings would accompany the proposed action. Appropriate erosion and sediment control measures would be taken during construction and renovation activities. Disturbed soil would be compacted and seeded to prevent erosion, and gravel and concrete would be replaced. Disturbance of highly erodible soils would be avoided wherever possible. The removal of shrink-swell soils and their replacement with fill might be required before construction could occur. Stormwater runoff from soils exposed during construction, renovation, and/or utility installation would be contained and/or diverted to prevent surface water quality degradation as well. This could be accomplished through the construction of desilting basins, sediment traps, silt fences, straw barriers, and other erosion control measures.

None of the other resource areas analyzed in this environmental assessment would require mitigation measures.

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SECTION 6.0

FINDINGS AND CONCLUSIONS

6.1 INTRODUCTION

This environmental assessment has been prepared to evaluate the potential effects on the natural and human environment from the proposed action of realigning Detroit Arsenal by transferring functions from DATP facilities to the western portion of the installation and the construction of a new 50,000-square-foot warehouse facility to accommodate those functions. The EA has examined a no action alternative and a preferred alternative. The no action alternative is prescribed by CEQ regulations to serve as the baseline against which the proposed action and alternatives are analyzed.

6.2 FINDINGS

The following subsections provide summaries of the potential effects on the human and natural environment that would result from implementation of the proposed action. Table 6-1 summarizes the level of environmental effect on each resource area that would result from the implementation of the proposed action, as well as cumulative effects associated with the proposed action. For a more detailed discussion of the analyses, refer to the appropriate subsections in Section 5.0, Environmental and Socioeconomic Consequences.

The evaluation of the proposed action identified as the Army's preferred alternative indicates that the physical and socioeconomic environments at Detroit Arsenal and in the ROI would not be significantly affected by proceeding with the relocation of Detroit Arsenal functions and associated construction and renovation activities. Implementation of the preferred alternative would not substantially alter baseline environmental conditions.

Direct short-term minor adverse effects on air quality, noise, soils, and water resources as a result of construction and renovation activities would be expected. Direct long-term minor adverse effects would also be expected for soil resources as a result of permanent alteration of soils in the area of the proposed construction. Direct long-term minor beneficial effects would be expected for air quality as a result of reduced emissions from the installation due to the closure of Building 4 and Building 5. Direct and indirect short-term minor beneficial effects on economic development would be expected as a result of construction and renovation activities.

Cumulative effects would include both long-term minor adverse effects and long-term minor beneficial effects. The realignment of functions from DATP to the west side of Detroit Arsenal, coupled with the anticipated addition of several large businesses to the local area, would have an adverse cumulative effect on local traffic circulation, particularly during rush hours. Traffic circulation should be addressed by the Macomb County Road Commission to ensure adequate transportation corridors are maintained around the arsenal. Economic stimulation through job creation and the input of millions of dollars associated with the planned reuse of the eastern portion of the installation and the planned construction on the western portion of the installation, along with the planned new businesses in the area, would be a beneficial contribution to the city of Warren and the ROI.

**Table 6-1
Summary of Effects for the Proposed Action**

Resource Area	Direct	Indirect
Land Use	No effect	No effect
Climate	No effect	No effect
Air Quality	A-	No effect
Noise	A-	No effect
Geology	A-	No effect
Water Resources	A-	No effect
Infrastructure	No effect	No effect
Hazardous and Toxic Materials	No effect	No effect
Permits and Regulatory Authorizations	No effect	No effect
Biological Resources	No effect	No effect
Cultural Resources	No effect	No effect
Economic Development	B-	B-
Socioeconomic Environment	No effect	No effect
Quality of Life	No effect	No effect
Installation Agreements	No effect	No effect
Cumulative Effects	A-/B-	A-/B-

A- Minor adverse effect
B- Minor beneficial effect

6.3 CONCLUSIONS

Based on the analysis performed in this EA, implementation of the Army's preferred alternative would have no significant direct, indirect, or cumulative impacts on the quality of the natural or human environment. Therefore, preparation of an Environmental Impact Statement is not required and a Finding of No Significant Impact will be prepared.

SECTION 7.0:
LIST OF PREPARERS

Susan Bartow

M.E.M., Water Resource Ecology, Duke University
B.A., Biology, Ithaca College
Years of Experience: 6

Wendy Brown

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B.S., Biology, Bucknell University
Years of Experience: 5

Shannon Cauley

B.S., Geology, Riker College
Years of Experience: 13

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B.S., Biology, Fairmont State College
B.S., Mathematics, Fairmont State College
Years of Experience: 10

Tom Magness

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B.S., Engineering, United States Military Academy
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Years of Experience: 2

Brian Pederson

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B.S., Business Administration, Mary Washington College
Years of Experience: 1

Kathy Rogovin

M.S., Toxicology, University of Washington
B.A., Zoology, Miami University
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Kristin Shields

B.A., Environmental Science, Sweet Briar College
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M.S., Geography, University of Tennessee
B.A., Geography, Geneseo State University
Years of Experience: 3

John Swanson

M.S., Environmental Engineering, The Pennsylvania State University
B.S., Environmental Engineering, The Pennsylvania State University
Assoc., Biology, Dutchess Community College
Years of Experience: 10

Paul Wilbur

J.D., Wayne State University Law School
B.A., English, University of Michigan
Years of Experience: 27

**SECTION 8:
DISTRIBUTION LIST**

The Honorable Spencer Abraham (Michigan Senator)
United States Senate
Dirksen Building, Room 241
Washington, DC 20510

The Honorable Carl Levin (Michigan Senator)
United States Senate
Russell Building, Room 459
Washington, DC 20510

The Honorable Sander M. Levin (Michigan Congressional Representative)
United States House of Representatives
2230 Rayburn House Office Building
Washington, DC 20515

The Honorable John Engler (Michigan Governor)
Capitol Building
Lansing, MI 48933

The Honorable Mark A. Steenburgh
Mayor of Warren
29500 Van Dyke Avenue
Warren, MI 48093

Warren Chamber of Commerce
30500 Van Dyke Avenue
Warren, MI 48093

Sterling Heights Chamber of Commerce
12900 Hall Road, Suite 110
Sterling Heights, MI 48313

Oakland County Chamber of Commerce
1760 South Telegraph Road, Suite 207
Bloomfield, MI 48302

Greater Detroit Chamber of Commerce
600 West Lafayette Blvd.
Detroit, MI 48226

Warren Public Library, Central Services
5951 Beebe
Warren, MI 48092

Macomb County Library
16480 Hall Road
Clinton Township, MI 48038

Troy Public Library
510 West Big Beaver
Troy, MI 48084

Detroit Main Library
5201 Woodward Avenue
Detroit, MI 48202

Mr. Charles Wooley
U.S. Fish and Wildlife Service
East Lansing Field Office
2651 Coolidge Road
East Lansing, MI 48823

Mr. Tom Weise
Michigan Department of Natural Resources
Wildlife Division
P.O. Box 30444
Lansing, MI 48909

Ms. Kathryn B. Echert
State Historic Preservation Office
Michigan Historical Center
717 W. Allegan Street
Lansing, MI 48918-1800

Mr. Alan K. Williams
District Manager
U.S. Army Corps of Engineers
600 Martin Luther King, Jr. Pl.
P.O. Box 59
Louisville, KY 40201-0059

Mr. Steve Morris, President (Local Reuse Committee Co-Chair)
Warren Chamber of Commerce
30500 Van Dyke Avenue, Suite 118
Warren, MI 48093-2178

Mr. Steven Payok (RAB Co-Chair)
27327 James
Warren, MI 48092

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**SECTION 9.0:
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SECTION 10.0:
PERSONS CONSULTED

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Wooley, Charles. U.S. Fish and Wildlife Service. September 1996.

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Appendix A
Agency Consultation Letters



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

East Lansing Field Office (ES)
2651 Coolidge Road
East Lansing, Michigan 48823

July 16, 1997

Susan Bartow
Tetra Tech, Inc.
10306 Eaton Pl.
Suite 340
Fairfax, VA 22030

Re: Endangered Species List Request, Detroit Arsenal, Warren, Michigan

Dear Ms. Bartow:

This letter is in response to your request of July 9, 1997, for information on listed and proposed endangered and threatened species and critical habitat which may be present within the area of the proposed project site. Your request and this response are made pursuant to Section 7(c) of the Endangered Species Act of 1973 (the Act), as amended.

Based on information presently available to the Fish and Wildlife Service, there are no listed or proposed species occurring within the area of the subject project. This presently precludes the need for further action on this project as required under Section 7 of the Act.

The Service advises, however, that should a species become officially listed or proposed before completion of this project, the Federal action agency for the work would be required to reevaluate its responsibilities under the Act. Further, should new information become available that indicates listed or proposed species may be present and/or affected, consultation should be initiated with the Service.

Since threatened and endangered species data is continually updated, new information pertaining to this project may become available which may modify these recommendations. Therefore, the Fish and Wildlife Service recommends your agency annually request updates to this list.

We appreciate your concern for endangered species and look forward to continued coordination with your agency. Any questions can be directed to Tom Eitniewski of this office at (517) 351-6283.

Sincerely,


for Charles M. Wooley
Field Supervisor

cc: Michigan Department of Natural Resources, Wildlife Division,
Lansing, MI (Attn: Tom Weise)

STATE OF MICHIGAN



**NATURAL RESOURCES
COMMISSION**

JERRY C. BARTNIK
KEITH J. CHARTERS
NANCY A. DOUGLAS
L. THORNTON EDWARDS, JR.
PAUL EISELE
WILLIAM U. PARFET
LLOYD F. WEEKS

JOHN ENGLER, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, PO BOX 30028, LANSING MI 48909-7528

K. L. COOL, Director

REPLY TO:
NATURAL HERITAGE
P.O. BOX 30180
LANSING MI 48909

July 30, 1997

Ms. Susan Bartow
Tetra Tech, Inc.
10306 Eaton Place, Suite 340
Fairfax, VA 22030

Dear Ms. Bartow:

Your request for information was checked against known localities for special natural features recorded in the Michigan Natural Features Inventory (MNFI) database, which is part of the Natural Heritage Program, Wildlife Division. The MNFI is an ongoing, continuously updated information base, which is the only statewide, comprehensive source of existing data on Michigan's endangered, threatened, or otherwise significant plant and animal species, natural plant communities, and other natural features.

Records in the MNFI database indicate that a qualified observer has documented the presence of special natural features at a site. The absence of records in the database for a particular site may mean that the site has not been surveyed. Records are not always up-to-date, and may require verification. In some cases, the only way to obtain a definitive statement on the status of natural features is to have a competent biologist perform a complete field survey.

The presence of listed species does not necessarily preclude development but may require alterations in the development plan. An endangered species permit will be required from the Department of Natural Resources, Wildlife Division, if any listed species would be taken or harmed.

If the project is located on or adjacent to wetlands, inland lakes, or streams, additional permits may be required. Contact the Michigan Department of Environmental Quality, Land and Water Management Division, P.O. Box 30473, Lansing, MI 48909 (517-373-1170).

The following is a summary of the results of the MNFI review of the site(s) in question:

There are no known occurrences of federal- or state-listed endangered, threatened, or otherwise significant species, natural plant communities, or natural features at the location(s) specified:
Macomb County, Detroit Arsenal, T1N R12E Section 16.

Thank you for your advance coordination in addressing the protection of Michigan's Natural Resource Heritage. If you have further questions, please call me at 517-373-1263.

Sincerely,

A handwritten signature in cursive script that reads "Lori G. Sargent".

Lori G. Sargent
Endangered Species Specialist
Wildlife Division

LGS:jao



DEPARTMENT OF THE ARMY
UNITED STATES ARMY TANK-AUTOMOTIVE AND ARMAMENTS COMMAND
WARREN, MICHIGAN 48397-5000

September 3, 1997

REPLY TO
 ATTENTION OF

Base Realignment and Closure Office

Bureau of History
 Michigan State Historic Preservation Officer
 Attention: Mr. John R. Halsey
 717 West Allegan
 Lansing, Michigan 48918-1800

Dear Mr. Halsey:

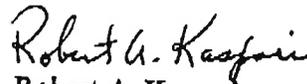
The Detroit Arsenal, located in the City of Warren, Michigan, is proposing to construct a warehouse structure near the northern boundary of the arsenal (see attached map). The warehouse consists of a 50,000 square feet of warehouse and administrative space serving the general storage needs of the Detroit Arsenal. All exterior and interior construction materials are selected based on durability and life cycle maintenance costs. The warehouse low exterior walls consist of integrally-colored smooth-faced and split-faced SMU veneer. Upper walls are insulation and finished system to match the cast-in-place concrete work at Building 210. Interior walls are painted CMU. The warehouse will be sited on a relatively flat and on open ground with a few trees. Access to the site is from the existing parking lot east of the site and from an existing unpaved road on the west and north sides of the site. We do not believe the proposed construction will have an impact on any cultural resources associated with the arsenal.

The Detroit Arsenal had a Cultural Resources Management Plan (CRMP) prepared in October of 1996 (Geo-Marine, Inc.) which identified areas of archeological sensitivity (Page II-3; Figure II-1). The CRMP does not indicate the potential for either prehistoric or historic archeological resources in the area of construction. Appendix G included with the CRMP identified one building on the Detroit Arsenal as potentially eligible for the National Register of Historic Places. Building 212, constructed in 1954, has been identified as the work of a master architect, Minoru Yamasaki, and has significant engineering and design features. The proposed construction will not impact Building 212 nor will it interfere with the viewshed of Building 212.

In consideration of the above, the Detroit Arsenal has applied the Criteria of Effect pursuant to 36 Code of Federal Regulations (CFR) 800.5(a) and 800.9(a) to the proposed construction parcel. The Detroit Arsenal has determined that the planned actions will have no effect on any potential historic property at the Detroit Arsenal and hereby provides notice to your office of such finding pursuant to 36 CFR 800.5(b). In addition, the Detroit Arsenal requests your concurrence with the finding of no effect. In the event that historic property is discovered during the implementation of the above referenced warehouse construction, the Detroit Arsenal will apply the provisions of 36 CFR 800.11 regarding the unanticipated discovery of unidentified historic properties.

For your convenience, if you concur with our determination, you may sign the signature block below and return a copy of this letter to our office. If we do not hear from you within 15 days of receipt of this letter, we will assume concurrence pursuant to 36 CFR 800.5 (b) and proceed accordingly. If you have any questions, please contact the undersigned at (810) 574-8026.

Sincerely,



Robert A. Kaspari
Chief, Base Realignment and Closure Office

Attachment

Concurrence:



Michigan State Historic Preservation Officer

Appendix B

Record of Non-Applicability (RONA) Concerning the General Conformity Rule (40 CFR Part 93)

**RECORD OF NON-APPLICABILITY CONCERNING THE
GENERAL CONFORMITY RULE (40 CFR PART 93)**

Detroit Arsenal, occupying approximately 342 acres in Warren, Michigan, serves as headquarters of the Tank-Automotive and Armaments Command. The primary mission of the command is the development, fielding, and sustainment of combat vehicles. Detroit Arsenal has served primarily as a production facility for tank components and a research and development test facility for tank-automotive vehicles. The 1995 Defense Base Closure and Realignment Commission recommended the realignment of Detroit Arsenal by closing and disposing of Detroit Army Tank Plant (DATP), which occupies 153 acres on the east side of the arsenal. Following the closure, the Army proposes to relocate personnel and functional elements previously located at DATP to remaining portions of Detroit Arsenal. The Army also proposes to construct on the Detroit Arsenal a 50,000 square foot high-bay general purpose warehouse to accommodate a portion of the functions being relocated from DATP and to perform minor interior modifications of existing structures to house personnel.

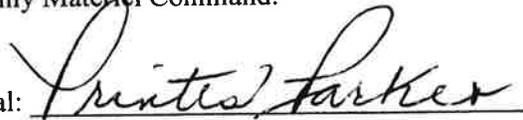
The proposed realignment is subject to the general conformity provision of Section 176(c) of the Clean Air Act Amendments of 1990 and the U.S. Environmental Protection Agency's implementing regulation, the General Conformity Rule (at 40 CFR Part 93). The General Conformity Rule provides that an action proposed to occur within a nonattainment area must, unless otherwise exempt, be accompanied by a Conformity Determination.

Detroit Arsenal is located within the Metropolitan Detroit-Port Huron Intrastate Air Quality Control Region. The air quality control region has been designated as an attainment area for all criteria pollutants except carbon monoxide, for which it is classified as being in nonattainment. The proposed action would involve emissions of carbon monoxide from vehicles used in construction of the general purpose warehouse and in modification of existing buildings. The proposed action would not affect carbon monoxide emissions from employees' vehicles as a result of their commuting to and from work since those employees are already assigned to the Detroit Arsenal. Warehouse construction site activities would involve site and foundation preparation and facility construction. Vehicles involved in the project would include a collection of wheeled tractors, scrapers, wheeled loaders, excavators and trenchers, pavers, and cranes and miscellaneous equipment over a period of three months. It is estimated that these vehicles would produce not more than four tons of carbon monoxide.

Actions that produce total emissions less than federal *de minimis* limits for criteria pollutants are exempt from the General Conformity Rule requirements. The threshold level for emissions of carbon monoxide is 100 tons per year in a nonattainment area. The estimated direct and indirect carbon monoxide emissions associated with the proposed action do not exceed the threshold level. Since the emissions are *de minimis*, the requirements of the General Conformity Rule are not applicable.

Proponent: U.S. Army Materiel Command.

Responsible Official:



Date:



Appendix C

Economic Impact Forecast System (EIFS) Modeling Results

Appendix C:
Economic Impact Forecast System (EIFS) Modeling Results

Socioeconomic Impact Assessment

Socioeconomic impacts are linked through cause-and-effect relationships. Military payrolls and local procurement contribute to the economic base for the region of influence (ROI). In this regard, the realignment of the Detroit Arsenal will have a multiplier effect on the local and regional economy. With the construction required for the preferred alternative, direct jobs will be created, generating new income and increasing personal spending. This spending typically creates secondary jobs, increases business volume, and increases revenues for schools and other social services.

The Economic Impact Forecast System

The U.S. Army, with the assistance of many academic and professional economists and regional scientists, developed the Economic Impact Forecast System (EIFS) to address the economic impacts of NEPA-requiring actions and to measure their significance. As a result of its designed applicability, and in the interest of uniformity, EIFS is mandated by ASA (IL&E) for use in NEPA assessment for base closure and realignment. The entire system is designed for the scrutiny of the populace affected by the actions being studied. The algorithms in EIFS are simple and easy to understand, but still have firm, defensible bases in regional economic theory.

EIFS is included as one of the tools of the Environmental Technical Information System (ETIS) and is implemented as an on-line system supported by the U.S. Army Construction Engineering Research Laboratories (USACERL) through the University of Illinois. The system is available to anyone with an approved login and password. It is available at all times through toll-free numbers, Telenet, and other commonly used communications. The ETIS Support Center at the university and the staff of USACERL are available to assist with the use of EIFS.

The databases in EIFS are national in scope and cover the approximately 3,700 counties, parishes, and independent cities that are recognized as reporting units by federal agencies. EIFS allows the user to "define" an economic region of influence (ROI) by simply identifying the counties to be analyzed. Once the ROI is defined, the system aggregates the data, calculates "multipliers" and other variables used in the various models in EIFS, and prompts the user for input data.

The EIFS Impact Models

The basis of the EIFS analytical capabilities is the calculation of multipliers that are used to estimate the impacts resulting from Army-related changes in local expenditures and/or employment. In calculating the multipliers, EIFS uses the economic base model approach, which relies on the ratio of total economic activity to "basic" economic activity. Basic, in this context, is defined as the production or employment engaged to supply goods and services outside the ROI or by federal activities (such as military installations and their employees). According to economic base theory, the ratio of total income to basic income is measurable (as the multiplier) and sufficiently stable so that future changes in economic activity can be forecast. This technique is especially appropriate for estimating "aggregate" impacts and makes the economic base model ideal for the EA/EIS process.

The multiplier is interpreted as the total impact on the economy of the region resulting from a unit change in its basic sector; for example, a dollar increase in local expenditures due to an expansion of its military installation. EIFS estimates its multipliers using a "location quotient" approach based on the concentration of industries within the region relative to the industrial concentrations for the nation.

The user selects a model to be used from a menu of options. EIFS has models for three basic military activity scenarios: standard, construction, and training. The user inputs into the selected model those data elements which describe the Army action: civilian and military to be moved and their salaries, and the local procurement associated with the activity being relocated. Once these are entered into the system, a projection of changes in the local economy is provided. These are projected changes in sales volume, employment, income, and population. These four "indicator" variables are used to measure and evaluate socioeconomic impacts.

The Significance of Socioeconomic Impacts

Once model projections are obtained, the Rational Threshold Value (RTV) profile allows the user to evaluate the "significance" of the impacts. This analytical tool reviews the historical trends for the defined region and develops measures of local historical fluctuations in sales volume, employment, income, and population. These evaluations identify the limits of the positive and negative changes within which a project can affect the local economy without creating a significant impact. The greatest historical changes define the boundaries that provide a basis for comparing an action's impact to the historical fluctuation in a particular area. Specifically, EIFS sets the boundaries by multiplying the maximum historical deviation of the following variables:

		<u>Increase</u>	<u>Decrease</u>
Business Volume	x	100%	75%
Personal Income	x	100%	67%
Total Employment	x	100%	67%
Total Population	x	100%	50%

These boundaries determine the amount of change that will affect an area. The percentage allowances are arbitrary, but sensible. The maximum positive historical value is allowed with expansion because economic growth is beneficial. While cases of damaging economic growth have been cited, and although the zero-growth concept is being accepted by many local planning groups, military base reductions and closures generally are more injurious to local economics than are expansions.

The major strengths of the RTV are its specificity to the region under analysis and its basis on actual historical data for the region. The EIFS impact models, in combination with the RTV, have proven successful in addressing perceived socioeconomic impacts. The EIFS model and the RTV technique for measuring the intensity of impacts have been reviewed by economic experts and have been deemed theoretically sound.

The following are the EIFS input and output data for construction, as well as the RTV values for the ROI. These data form the basis for the socioeconomic impact analysis presented in Section 5.0.

CONSTRUCTION

Project name: Detroit Arsenal Realignment

Default price deflators:

baseline year (ex. business volume) (CPI - 1987) = 100.0
output and incomes (ex b.v.) (CPI - 1993) = 126.3
baseline year (construction) (ENR-const - 1987) = 100.0
local expenditures for construction (ENR-const - 1993) = 118.2
output and incomes (construction) (ENR-const - 1993) = 118.2

If entering total expenditures, enter 1

local expenditures, enter 2 : 1

Dollar volume of construction project: \$6,400,000

Local expenditures of project: \$4,291,100.94 (calculated)

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) 0

***** CONSTRUCTION IMPACT FORECAST FOR Detroit Arsenal Realignment *****

Export income multiplier:	3.0348	
Change in local		
Sales volume	Direct: \$3,660,000	
	Induced: \$7,448,000	
	Total: \$11,108,000	(0.008%)
Employment	Direct: 22	
	Total: 106	(0.005%)
Income	Direct: \$458,000	
	Total (place of work): \$2,957,000	
	Total (place of residence): \$2,935,000	(0.003%)
Local population	0	(0.000%)
Local off-base population	0	
Number of school children	0	
Demand for housing	Rental: 0	
	Owner occupied: 0	
Government expenditures.....	\$160,000	
Government revenues	\$240,000	
Net Government revenues	\$80,000	
Civilian employees expected to relocate:	0	
Military employees expected to relocate:	0	

RATIONAL THRESHOLD VALUES

All dollar amounts are in thousands of dollars.
 Dollar adjustment based on Consumer Price Index (1987=100).

BUSINESS VOLUME (using Non-Farm Income)

YEAR	Non-Farm income	adjusted income	change	deviation	%deviation
1969	16,322,488	48,291,386	-2,394,139	-2,646,064	-5.479 %
1970	16,431,214	45,897,247	1,282,033	1,030,108	2.244 %
1971	17,597,871	47,179,280	3,608,199	3,356,273	7.114 %
1972	19,603,966	50,787,479	3,363,436	3,111,510	6.127 %
1973	22,201,875	54,150,915	-3,696,451	-3,948,376	-7.291 %
1974	22,956,781	50,454,464	-4,581,875	-4,833,800	-9.581 %
1975	22,798,677	45,872,589	4,111,489	3,859,564	8.414 %
1976	26,241,641	49,984,078	3,800,511	3,548,585	7.099 %
1977	30,065,586	53,784,589	2,250,484	1,998,558	3.716 %
1978	33,733,114	56,035,072	-1,772,626	-2,024,552	-3.613 %
1979	36,355,839	54,262,446	-6,595,118	-6,847,044	-12.618 %
1980	36,274,836	47,667,328	-3,200,390	-3,452,315	-7.243 %
1981	37,307,762	44,466,938	-3,284,558	-3,536,483	-7.953 %
1982	36,611,137	41,182,381	767,809	515,883	1.253 %
1983	38,426,373	41,950,190	3,624,023	3,372,098	8.038 %
1984	43,204,355	45,574,213	3,594,233	3,342,307	7.334 %
1985	48,234,244	49,168,445	4,303,455	4,051,530	8.240 %
1986	51,600,384	53,471,901	180,278	-71,647	-0.134 %
1987	53,652,179	53,652,179	1,453,859	1,201,934	2.240 %
1988	57,310,280	55,106,038	379,840	127,915	0.232 %
1989	60,479,608	55,485,879	-1,488,322	-1,740,248	-3.136 %
1990	61,935,196	51,969,586	-2,027,970	-2,279,896	-4.222 %
1991	62,051,687	54,085,672	2,116,086	1,864,160	3.587 %
1992	66,417,207				

average yearly change:	251,925
maximum historic positive deviation:	4,051,530
maximum historic negative deviation:	-6,847,044
maximum historic % positive deviation:	8.414 %
maximum historic % negative deviation:	-12.618 %
positive rtv:	8.414 %
negative rtv:	-9.464 %

PERSONAL INCOME

YEAR	Personal income	adjusted income	change	deviation	%deviation
1969	18,825,846	55,697,770			
1970	19,301,281	53,914,194	-1,783,577	-2,456,935	-4.411 %
1971	20,774,615	55,696,020	1,781,826	1,108,468	2.056 %
1972	22,983,825	59,543,590	3,847,571	3,174,212	5.699 %
1973	25,762,024	62,834,205	3,290,614	2,617,256	4.396 %
1974	27,279,542	59,955,037	-2,879,168	-3,552,526	-5.654 %
1975	28,132,630	56,604,888	-3,350,149	-4,023,507	-6.711 %
1976	31,720,621	60,420,230	3,815,342	3,141,984	5.551 %
1977	35,792,855	64,030,150	3,609,920	2,936,561	4.860 %
1978	39,857,961	66,209,237	2,179,086	1,505,728	2.352 %
1979	43,464,622	64,872,570	-1,336,667	-2,010,025	-3.036 %
1980	45,850,477	60,250,299	-4,622,271	-5,295,629	-8.163 %
1981	48,215,291	57,467,569	-2,782,731	-3,456,089	-5.736 %
1982	48,680,938	54,759,209	-2,708,359	-3,381,718	-5.885 %
1983	51,366,903	56,077,406	1,318,197	644,838	1.178 %
1984	57,108,209	60,240,725	4,163,319	3,489,960	6.223 %
1985	62,459,190	63,668,900	3,428,175	2,754,817	4.573 %
1986	66,810,833	69,234,024	5,565,124	4,891,765	7.683 %
1987	69,187,591	69,187,591	-46,433	-719,791	-1.040 %
1988	73,652,784	70,819,985	1,632,394	959,035	1.386 %
1989	78,339,885	71,871,454	1,051,470	378,111	0.534 %
1990	81,493,984	71,049,683	-821,771	-1,495,130	-2.080 %
1991	82,639,327	69,212,166	-1,837,517	-2,510,875	-3.534 %
1992	87,415,201	71,185,015	1,972,850	1,299,491	1.878 %

average yearly change:	673,358
maximum historic positive deviation:	4,891,765
maximum historic negative deviation:	-5,295,629
maximum historic % positive deviation:	7.683 %
maximum historic % negative deviation:	-8.163 %
positive rtv:	7.683 %
negative rtv:	-5.469 %

EMPLOYMENT

YEAR	Employment	change	deviation	%deviation
1969	1,795,035			
1970	1,751,248	-43,787	-55,770	-3.107 %
1971	1,734,522	-16,726	-28,709	-1.639 %
1972	1,782,209	47,687	35,704	2.058 %
1973	1,863,993	81,784	69,801	3.917 %
1974	1,850,558	-13,435	-25,418	-1.364 %
1975	1,731,008	-119,550	-131,533	-7.108 %
1976	1,795,333	64,325	52,342	3.024 %
1977	1,876,312	80,979	68,996	3.843 %
1978	1,953,887	77,575	65,592	3.496 %
1979	1,955,457	1,570	-10,413	-0.533 %
1980	1,833,432	-122,025	-134,008	-6.853 %
1981	1,790,368	-43,064	-55,047	-3.002 %
1982	1,710,569	-79,799	-91,782	-5.126 %
1983	1,726,132	15,563	3,580	0.209 %
1984	1,821,461	95,329	83,346	4.828 %
1985	1,935,643	114,182	102,199	5.611 %
1986	1,988,630	52,987	41,004	2.118 %
1987	2,019,153	30,523	18,540	0.932 %
1988	2,063,860	44,707	32,724	1.621 %
1989	2,111,341	47,481	35,498	1.720 %
1990	2,113,584	2,243	-9,740	-0.461 %
1991	2,058,041	-55,543	-67,526	-3.195 %
1992	2,070,644	12,603	620	0.030 %

average yearly change:	11,983
maximum historic positive deviation:	102,199
maximum historic negative deviation:	-134,008
maximum historic % positive deviation:	5.611 %
maximum historic % negative deviation:	-7.108 %
positive rtv:	5.611 %
negative rtv:	-4.762 %

POPULATION

YEAR	Population	change	deviation	%deviation
1969	4,191,000			
1970	4,207,000	16,000	26,783	0.639 %
1971	4,219,200	12,200	22,983	0.546 %
1972	4,207,300	-11,900	-1,117	-0.026 %
1973	4,180,200	-27,100	-16,317	-0.388 %
1974	4,157,500	-22,700	-11,917	-0.285 %
1975	4,124,700	-32,800	-22,017	-0.530 %
1976	4,086,000	-38,700	-27,917	-0.677 %
1977	4,068,000	-18,000	-7,217	-0.177 %
1978	4,062,000	-6,000	4,783	0.118 %
1979	4,052,200	-9,800	983	0.024 %
1980	4,034,800	-17,400	-6,617	-0.163 %
1981	3,993,900	-40,900	-30,117	-0.746 %
1982	3,940,300	-53,600	-42,817	-1.072 %
1983	3,902,100	-38,200	-27,417	-0.696 %
1984	3,897,200	-4,900	5,883	0.151 %
1985	3,907,000	9,800	20,583	0.528 %
1986	3,914,100	7,100	17,883	0.458 %
1987	3,926,400	12,300	23,083	0.590 %
1988	3,911,300	-15,100	-4,317	-0.110 %
1989	3,908,100	-3,200	7,583	0.194 %
1990	3,913,900	5,800	16,583	0.424 %
1991	3,928,000	14,100	24,883	0.636 %
1992	3,943,000	15,000	25,783	0.656 %

average yearly change:	-10,783
maximum historic positive deviation:	26,783
maximum historic negative deviation:	-42,817
maximum historic % positive deviation:	0.656 %
maximum historic % negative deviation:	-1.072 %
positive rtv:	0.656 %
negative rtv:	-0.536 %



ENVIRONMENTAL MANAGEMENT PROGRAM



Program Reference No.: EMP-02

Champion: Florence Trevino

Department/Area(s): Installation Wide

Product/Activity/Service: Installation Wide

Significant Aspect: Solid Wastes identified as significant

Target: Recycle greater than 40% waste (weight recycled/weight to landfill + weight recycled) by end of 4th quarter (per calendar year).
 -Reduce waste to landfill (not including C&D) by 5% from FY2005 baseline by end of fiscal year 2008.

Objective: Reduce Waste to Landfill

Program Plan: Prevention of Pollution through reuse, recovery, and recycling

- XX – USAG-M Activities
- XX – TARDEC Activities
- XX – USAG-M and TARDEC Activities

Task No.	Activity	Responsible Party	Schedule	Monitoring/ Tracking/ Reporting Requirements	Status / Comments
1	Identify recyclable waste streams and prioritize them	Florence Trevino	Annually and as new waste streams occur	Pollution Prevention Plan	Currently reviewing: Paper, Cardboard, plastics, antifreeze recycling
2	Review and update the Integrated Solid Waste Management Plan.	Florence Trevino	Annually	Integrated Solid Waste Management Plan Email	-Versar contracted to updated plan -5/31/06 – Funding suspended for all projects -Refer to P2 Plan for Documentation
3	Review the Pollution Prevention Plan for new P2 opportunities and update as necessary.	Florence Trevino	Annually	Pollution Prevention Plan Email	-Versar contracted to updated plan -5/31/06 – Funding suspended for all projects -Refer to P2 Plan for Documentation



ENVIRONMENTAL MANAGEMENT PROGRAM

Task No.	Activity	Responsible Party	Schedule	Monitoring/ Tracking/ Reporting Requirements	Status / Comments
4	Enter solid waste and recycled/diverted waste into SWARS database and Waste Diversion Tracking Matrix at least monthly.	Florence Trevino	Monthly	SWARS, Waste Diversion Tracking Matrix	See SWARS for current data
5	Evaluate success of recyclable/diverted wastes. (review all waste streams including solid waste, C&D waste, etc)	Florence Trevino	Annually	SWARS	Last completed September 2005.
6	Evaluate progress towards target utilizing SWARS database.	Florence Trevino	Quarterly	SWARS	Commander briefed quarterly.
7	Increase education about pollution prevention through the USAGM website.	P2 Committee	As Needed	USAGM Website Meeting Minutes	
7 a.	Produce educational logon screens about recycling (paper, cell-phones, computers, etc.)	P2 Committee	As needed Quarterly	Meeting Minutes Log on Screen	Occurred in May 2006 and First two weeks of June 2006
7 b.	Write various P2 facts in "Did You Know?" articles for Life Cycle Management Command Report	P2 Committee	Bi-Weekly	Intranet	Updated Bi-weekly
7 c.	Provide various information on the USAG-M website under the P2 Committee link.	P2 Committee	Ongoing	Intranet	Contains information on recycling, household wastes, etc.
8	Increase education about pollution prevention during designated Pollution Prevention week, America Recycles Day, and Earth Day.	Florence Trevino	Annually	Log On Screens Various P2 Articles Meeting Minutes	P2 week occurs every September
9	Evaluate plastic recycling program.	Florence Trevino	October 2005		
9 a.	P2 committee reviewed plastics recycling opportunities	P2 Committee	October 2005 COMPLETE	Meeting Minutes	



ENVIRONMENTAL MANAGEMENT PROGRAM

Task No.	Activity	Responsible Party	Schedule	Monitoring/ Tracking/ Reporting Requirements	Status / Comments
9 b.	A site was identified to send plastics for recycling. (jewel cases, cds, cassettes, vhs tapes and covers)	Florence Trevino	October 2005 COMPLETE	HSMS Newsletter	
9 c.	Ship plastics via US Mail for recycling.	Florence Trevino Jill Jebee	Ongoing	US Mail Internal Communication	
10	Collect toner cartridges, eye glasses, cell phones, and batteries for recycling	Florence Trevino	Ongoing	Waste Records	Collected materials donated to charitable causes. Recorded in SWARS.
11	Increase participation in cardboard and paper recycling program.	P2 Committee	Ongoing	Waste Records	
11 a.	Provide popup screens and "Did You Know?" articles to increase employee awareness.	P2 Committee	As necessary	Meeting Minutes Pop Up Screens Articles	
11 b.	Increase number of paper and cardboard bins available to B229 and B200 Cafeterias.	P2 Committee	April 2006 and ongoing	Emails	Provided more bins as requested.
11 c.	Increase the number of desktop recycling bins for paper as requested.	P2 Committee	As requested	Emails Phone Calls	Provided to personnel as requested
11 d.	Increase large blue paper bins for paper recycling as requested.	P2 Committee	As requested	Emails Phone Calls	Provided to personnel as requested
12	Environmental Quality Chaired Committee quarterly (or as needed) meetings to discuss environmental policies, plans, and procedures for waste minimization.	Environmental Quality Chaired Committee	As needed	Meeting Minutes	
13	Review needed additions to program based on data to meet target.	EMS Steering Committee	As needed	Meeting Minutes	Updated and reviewed in June 2006.
14	Investigate rechargeable alkaline battery use.	Florence Trevino	February 2006 COMPLETE	P2 Plan	Not Cost Effective.
15	Investigated and implemented lead acid battery recycling program.	Florence Trevino	Ongoing	Shipping Documents SWARS	Increased effectiveness by providing recycling bins in 1 st Quarter of 2006



ENVIRONMENTAL MANAGEMENT PROGRAM

Task No.	Activity	Responsible Party	Schedule	Monitoring/ Tracking/ Reporting Requirements	Status / Comments
16	Implemented used tire recycling program.	Solid Waste Program Manager	COMPLETED	Shipping Documents	
17	Investigated and implemented shop towel recycling program.	Florence Trevino	2004 COMPLETE	Internal communications	Not Cost effective. Not occurring anymore.
18	Investigating biodegradable plastic ware in the cafeteria.	P2 Committee	May 2006	Email	
19	Increase automatic hand dryers to reduce paper towel waste.	Florence Trevino	Ongoing	Spirit Checklist	Completed as funding becomes available.



ENVIRONMENTAL MANAGEMENT PROGRAM



Program Reference No.: EMP-01

Champion: Florence Trevino

Department/Area(s): Installation Wide

Product/Activity/Service: All electricity, natural gas, and steam usage

Significant Aspect: Electricity, Natural Gas, Steam

Target: Reduce Energy Consumption by 35% btu/gross sq ft from 1985 annual average for calendar year 2010

Objective: Reduce Energy Consumption

XX – USAG-M Activities
 XX – TARDEC Activities
 XX – USAG-M and TARDEC Activities

Program Plan: Energy Reduction Program

Task No.	Activity	Responsible Party	Schedule	Monitoring/ Tracking/ Reporting Requirements	Status / Comments
1	Establish baseline electricity and natural gas usage for 1985.	Florence Trevino	Completed	AWERS	Available upon request.
2	Monitor electricity, natural gas and steam usage.	Florence Trevino Maryanne Fourtne	Monthly	Utility Invoices AWERS Property Database	Obtain data from utility invoices. Set up graphs to track performance (performance metrics). Production normalized data based gross square footage.
3	Replace lights with T8 lights which are more energy efficient.	Mohammed Ikram	July 2006	ESPC Scheduling Plan	Stated to be completed July 2006
4	Replace chillers (Building 230) to be more energy (steam) efficient.	Mohammed Ikram	July 2006	Work orders	To be complete July 2006.



ENVIRONMENTAL MANAGEMENT PROGRAM

Task No.	Activity	Responsible Party	Schedule	Monitoring/ Tracking/ Reporting Requirements	Status / Comments
5	Implement Energy Management Control System – Building Shutdown Procedures	TECOM	January 2000 through January 2001 (Complete)	Reports/Graphs	Automated system to conserve heat, ventilation, lighting, air conditioning and other energy consuming equipment for most major buildings.
6	Install energy efficient steam traps throughout the base	Mohammed Ikram	May 2006 COMPLETE	Reports/Graphs Work Order	
7	For new construction contracts incorporate energy efficient equipment (e.g. heating and cooling systems, lights, appliances, etc.).	Florence Trevino	January 2005 and Ongoing	Meeting minutes Environmental Assessment Checklist	Per SPIRIT guidelines and Executive Order 13123
8	Install variable air volume controllers in the HVAC systems in B215 and B230.	Mohammed Ikram	Mid July 2006	Work Order	
9	Environmental Quality Chaired Committee quarterly (or as needed) meetings to discuss environmental policies, plans, and procedures for energy reduction.	Environmental Quality Chaired Committee	As needed	Meeting Minutes	
10	Evaluate progress towards target (normalized) utilizing performance matrices.	EMS Steering Committee/IMA	Semi-Annually	Meeting Minutes	
11	Evaluate effectiveness of initiatives and need for program adjustments to meet target. Report to Steering Committee, CFT, and Management.	Steering Committee, Management Team	Management Team/Annual Steering Committee/Quarterly	Meeting Minutes	



ENVIRONMENTAL MANAGEMENT PROGRAM

Task No.	Activity	Responsible Party	Schedule	Monitoring/ Tracking/ Reporting Requirements	Status / Comments
12	Provide "Did you Know?" Articles to educate employees and increase energy use awareness.	Florence Trevino	As needed	USAG-M Intranet	

