PROGRAMMATIC ENVIRONMENTAL ASSESSMENT FOR THE FABRICATION, ASSEMBLY AND MANUFACTURING OF WEAPON SYSTEMS PLATFORMS AT JOINT SYSTEMS MANUFACTURING CENTER-LIMA

Joint Systems Manufacturing Center – Lima, Ohio

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EXECUTIVE SUMMARY

ES.1 INTRODUCTION

This Programmatic Environmental Assessment (PEA) evaluates potential environmental effects resulting from the potential additional fabrication, assembly, manufacturing and testing (referred to hereafter as manufacturing operations) of weapons systems platforms at the Joint Systems Manufacturing Center- Lima (JSMC-Lima). The document is written to provide the leadership of JSMC-Lima information that can be used to make environmentally sound decisions regarding potential additional manufacturing operations.

ES.2 PROPOSED ACTION

The proposed action is for JSMC-Lima, in support of the Department of Defense, to modify existing processes and/or facilities to support new and/or additional fabrication and manufacturing activities. These processes and facilities are used for manufacturing operations of weapon systems, or fabricate and assemble major components for weapons systems or vehicles for assembly at other locations. JSMC-Lima will perform a risk assessment on the fabrication, assembly and testing requirements for proposed programs and identify required mitigation measures.

ES.3 ALTERNATIVES

ES.3.1 No Action Alternative.

The no action alternative provides an environmental baseline against which to compare the potential effects of the proposed action. Under the no action alternative JSMC-Lima will maintain the status quo for manufacturing operations for existing weapon system platforms, and maintain the current level of manufacturing operations.

ES.3.2 Preferred Alternative

Under this alternative, JSMC-Lima would modify existing processes and/or facilities to manufacturing operations of weapon systems, or fabricate major components for weapons systems or vehicles for assembly at other locations.

JSMC-Lima, in support of the DoD, would modify existing processes and/or facilities to support manufacturing operations, or fabricate and assemble major components for weapons systems or vehicles for assembly at other locations. JSMC-Lima would perform a risk assessment on the fabrication, assembly and testing requirements for proposed programs and identify required mitigation measures. This is the preferred alternative.

ES.4 ENVIRONMENTAL CONSEQUENCES

ES.4.1 No Action Alternative: Under this alternative, JSMC-Lima would maintain the status quo for manufacturing operations for existing weapon system platforms, and maintain the current level of manufacturing operations. JSMC-Lima would continue its current level of operations, and add additional manufacturing operations only when a current activity ends.

ES.4.2 Preferred Alternative: Under this alternative, JSMC-Lima would modify existing processes and/or facilities to manufacturing operations of weapon systems, or fabricate major components for weapons systems or vehicles for assembly at other locations.

Increased manufacturing operations could increase employment, and thus traffic volume on roads near, and leading to, JSMC-Lima. Increased manufacturing operations would also cause an increase in truck traffic. The total increase in traffic volume could affect level of service (LOS), though only two roads near JSMC-Lima have LOS below "C." Increased manufacturing operations would likely cause the generation of increased solid and hazardous waste. The JSMC-Lima is licensed by the Ohio Environmental Protection Agency (Ohio EPA) as a large-quantity generator of hazardous waste. JSMC-Lima has sound, well-established policies and procedures to effectively manage its solid and hazardous waste. Increased manufacturing operations at JSMC-Lima could involve fabricating a major component to be assembled elsewhere, or final production which may require use of the JSMC-Lima test track. This condition may require a noise level analysis of vehicle(s) operated on the test track, as well as an analysis of the capability of the test track to conduct needed operational tests. If noise levels from vehicle testing exceeds those from the M1 Abrams tank, JSMC-Lima may need to identify and implement mitigation measures to avoid objectionable levels of noise reaching local residents. Additional manufacturing operations at JSMC-Lima would have a positive effect on the local economy.

JSMC-Lima is considered a major source of air pollutants and is required to operate under the provisions of a Title V Permit issued by the Ohio EPA under the auspices of the Clean Air Act. As such, any new sources of air emissions or extensive modification of JSMC-Lima's existing processes would require an analysis of the effects such changes would have on the county's air quality. The level of detail and associated costs would be proportional to the proposed changes but the installation must be able to demonstrate to local, state, or federal regulators that the proposed process change would have no significant impact on air quality. When dealing with the Clean Air Act successful implementation of a proposed action will require careful preparation of all required documentation.

Cumulative impacts arising from increased manufacturing operations at JSMC-Lima, coupled with increased operations on industrially-zoned properties near JSMC-Lima could contribute to increased traffic and a reduced LOS on roads near JSMC-Lima. The Lima-Allen County Regional Planning Commission has identified two projects to improve roadways in the area which may mitigate some of the potential effects

associated with the increased traffic volume at JSMC-Lima. Increased industrial operations in the area could, along with JSMC-Lima affect the air quality of the region. Increased traffic volume, and potential emissions could affect air quality compliance in the Lima-Allen County area. However, additional industry located near JSMC-Lima would further contribute to and enhance the area's economy.

ES.5 Conclusions

Increasing manufacturing operations of weapons systems at JSMC-Lima within the confines of existing facilities would have minimal direct, indirect, or cumulative impacts on the environment and/or human health.

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SECTION 1.0: PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION AND METHODOLOGY

This Programmatic Environmental Assessment (PEA) evaluates potential direct, indirect, and cumulative effects of expanding capabilities at Joint Systems Manufacturing Center – Lima (JSMC-Lima) to fabricate, manufacture, assemble and test (hereafter referred to manufacturing operations) the full spectrum of armored combat vehicles and weapon systems platforms. A weapon system platform consists a weapon system (e.g., the 120 mm gun for the M1 Abrams Tank and associated computer control programs) and the platform from which it operates (e.g., the hull and turret of the M1). To insure proper utilization of this PEA, as well as compliance with the President's Council for Environmental Quality (CEQ) guidance and the Army's NEPA regulations (32 CFR Part 651), a specific Record of Environmental Consideration (REC) checklist is included that provides a framework for identifying potential NEPA requirements beyond the scope of this PEA. If the conditions of the checklist in Appendix A are met, and if any required procedures and mitigations are adopted by the JSMC-Lima, a REC may be prepared that references this PEA and the proposed action may proceed. Otherwise a site-specific supplemental EA will be prepared where needed.

The purpose of this PEA is to facilitate compliance with the Army's NEPA regulations (32 CFR Part 651) at JSMC-Lima; providing (1) a framework to address the impacts of this type of action, (2) a procedure to certify a complete understanding and mitigation plan (when required) for all impacts addressed in this PEA through the use of a specific REC, and (3) a procedure to ensure the preparation of a focused supplemental NEPA document when site specific (tiered) analyses identify the need. This PEA provides the public and decision-makers with the information required to understand and evaluate the potential environmental consequences of JSMC-Lima conducting manufacturing operations at JSMC-Lima, comprehend the need for required mitigations and certify their viability, and identify where further site-specific review and analysis may be necessary.

If the considerations and analyses in this PEA are applicable to local conditions and if no additional issues are identified, requirements of NEPA can be met through the use of this PEA and the completion of the specified REC checklist (Appendix A), and subsequent REC. The REC checklist represents the first tier of environmental impact analysis associated with JSMC-Lima conducting fabrication, assembly and testing activities.

Potential environmental effects resulting from the proposed action and alternatives, including the No Action Alternative, are identified in this PEA.

1.2 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

This PEA analyzes the direct, indirect, and cumulative effects of JSMC-Lima conducting additional fabrication, manufacturing, assembly, and testing (manufacturing operations) of weapons system platforms in support of the Department of Defense (DoD).

1.3 REGULATORY AUTHORITY

This Programmatic Environmental Assessment has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969, as implemented by the President's Council on Environmental Quality's (CEQ) regulation governing NEPA (Title 40 CFR 1500), and the U.S. Army's regulation governing NEPA, *Environmental Effects of Army Actions* (Title 32 CFR 651).

1.4 PURPOSE OF THE PROPSED ACTION

The purpose of the proposed action is to maintain and expand capabilities to fabricate, manufacture, assemble and test the full spectrum of armored combat vehicles and weapon systems platforms at JSMC-Lima. This would require some modification to existing processes and/or facilities to fabricating, manufacturing and assembly operations

1.5 NEED FOR THE PROPOSED ACTION

JSMC-Lima is a state-of-the-art center for fabrication, assembly, manufacturing and testing of weapon systems platforms for the DoD. JSMC-Lima is ideally suited to fabricate, assemble and test weapon systems to meet short-term war-time mission requirements. Additional manufacturing operations of weapons systems and armored vehicles will likely be required to meet war-fighter requirements. Before new manufacturing operations are assigned to JSMC-Lima, the installation must perform an environmental analysis.

SECTION 2.0: DESCRIPTION OF THE PROPOSED ACTION

2.1 INTRODUCTION

This section of the document provides a description of the proposed action and its implementation, as well as an overall background of the JSMC-Lima, to include the location, and description of the facility and description of on-going mission activities.

2.2 PROPOSED ACTION AND IMPLEMENTATION

The proposed action is for JSMC-Lima in support of the Department of Defense, to modify existing processes and/or facilities to support expanded manufacturing operations of weapon systems, or fabricate and assemble major components for weapons systems or vehicles for assembly at other locations. JSMC–Lima will perform a risk assessment on the fabrication, assembly and testing requirements for proposed programs and identify required mitigation measures.

2.3 OPERATIONS AND MISSION OF THE JOINT SYSTEMS MANUFACTURING CENTER-LIMA (JSMC-Lima)

The JSMC-Lima is a DoD industrial complex located within Shawnee Township, Allen County, Ohio, approximately 1 mile south of the City of Lima, OH. Lima is located approximately 80 miles northwest of Columbus, Ohio, 110 mi north of Cincinnati, 70 miles south-southwest of Toledo, Ohio and 130 miles northeast of Indianapolis, Indiana (Figure 2.1).

Figure 2.1. Western Ohio Region

Source: http://maps.google.com/

The JSMC-Lima site consists of a total of 369 acres, of which 62 acres are improved grounds, 36 acres are semi-improved grounds and 271 are unimproved grounds. The facility consists of 48 buildings with a total enclosed space of 1,634,517 square feet. This includes all production facilities, administrative areas, warehouses, and storage areas. The majority of production activities take place in building 147, accounting for approximately 902,142 square feet of enclosed space. The facility also has a vehicle test track. Administrative offices for the facility are currently located in a wooden structure dating to the WWII era. A new two-story administrative building totaling 45,000 square feet is under construction with an expected completion date of summer 2008. Remaining portions of the site have been left in a natural state.

2.4 SITE HISTORY

Construction of the facility began in May of 1941 and was completed in November of 1943. Over the years, the facility has been run by several contractors (United Motor Services, Ford Motor Corporation, Chrysler Defense Incorporated and General Dynamics), has had several names (Lima Ordnance Depot, Lima Ordnance Manufacturing Center, US Army Detroit Arsenal Tank Plant/US Army Modification Center – Lima Complex, Lima Army Tank Center and Lima Army Tank Plant), has had multiple functions (manufacturing gun barrels, vehicle storage, vehicle modification and production of new combat vehicles), and changed in size six times (ranging from 169 to 465 acres) (Whiteman, 2006). The facility was officially re-designated as Joint Systems Manufacturing Center – Lima in 2004 (US Army, 2004).

From the early 1960's until 1979, when production began on the M1A1 Abrams tank, the facility was maintained as a potential Government-owned, Contractor-operated facility. During that time, the facility was used to store equipment and portable equipment packages. Also during that time, 162.5 acres of property on the southern boundary of the facility was declared excess, and in May 1971 was acquired by the Johnny Appleseed Metropolitan Park District (Clayton Group, 2004).

On August 6, 1976, The Secretary of the Army named Lima Army Modification Center (LAMC) as the initial production site for the XM1 Main Battle Tank. In connection to this new tank production mission, a 250,000 square-foot addition was made to the main production plant, a 1.21-mile vehicle test track constructed, and existing buildings were updated and modernized. In March, 1977 the Commissioners of the Johnny Appleseed Metropolitan Park District issued title of 81.76 acres of land to LAMC that had previously been declared excess. This land was used to build the test track and for future outdoor material storage. Department of the Army General Order Number 3, dated April 1, 1979 placed LAMC in an active status.

Chrysler Defense Incorporated (CDI) developed the XM1 Tank as the Army's first turbine-powered tank. Production operations at LAMC began in May 1979, with the first two completed tanks presented to the Army in February, 1980. In the same month, the Army re-designated the facility the Lima Army Tank Center. CDI reached full production of 30 M1 Abrams tanks per month by late 1981 with a workforce of 1,900 employees and a government staff of 100 (Clayton Group, 2004).

In early 1982, CDI was sold to General Dynamics Incorporated, and in March, General Dynamics was officially named the prime contractor for the production of the M1 and M60 combat tanks. Production of the M60 phased out by the mid 1980's and production of the M1 continued until 2001. The facility produced 6,375 M1 Abrams tanks between 1980 and 2001.

Since the termination of producing new M1 tanks in 2001, the facility has had the mission of rebuilding older versions of the vehicle. This is a two-phase operation where the vehicle is stripped of all equipment, down to the bare turret and hull, at Anniston Army Depot (Alabama). The turret and hull are shipped by rail to JSMC-Lima where they are sand-blasted down to bare metal, and re-built to a finished product.

Other manufacturing operations currently underway at JSMC-Lima in support of DoD include the Expeditionary Fighting Vehicle (EFV) for the US Marine Corps. The JSMC-Lima facility also manufactures major components of other military vehicles or weapons platforms that undergo final assembly at other facilities. Examples include manufacturing the upper hull of the Stryker combat vehicle and the hull of the Cougar armored wheeled vehicle, and other prototypes.

The JSMC-Lima currently employs approximately 40 government and 1,000 contractor employees (Lane, 2007).

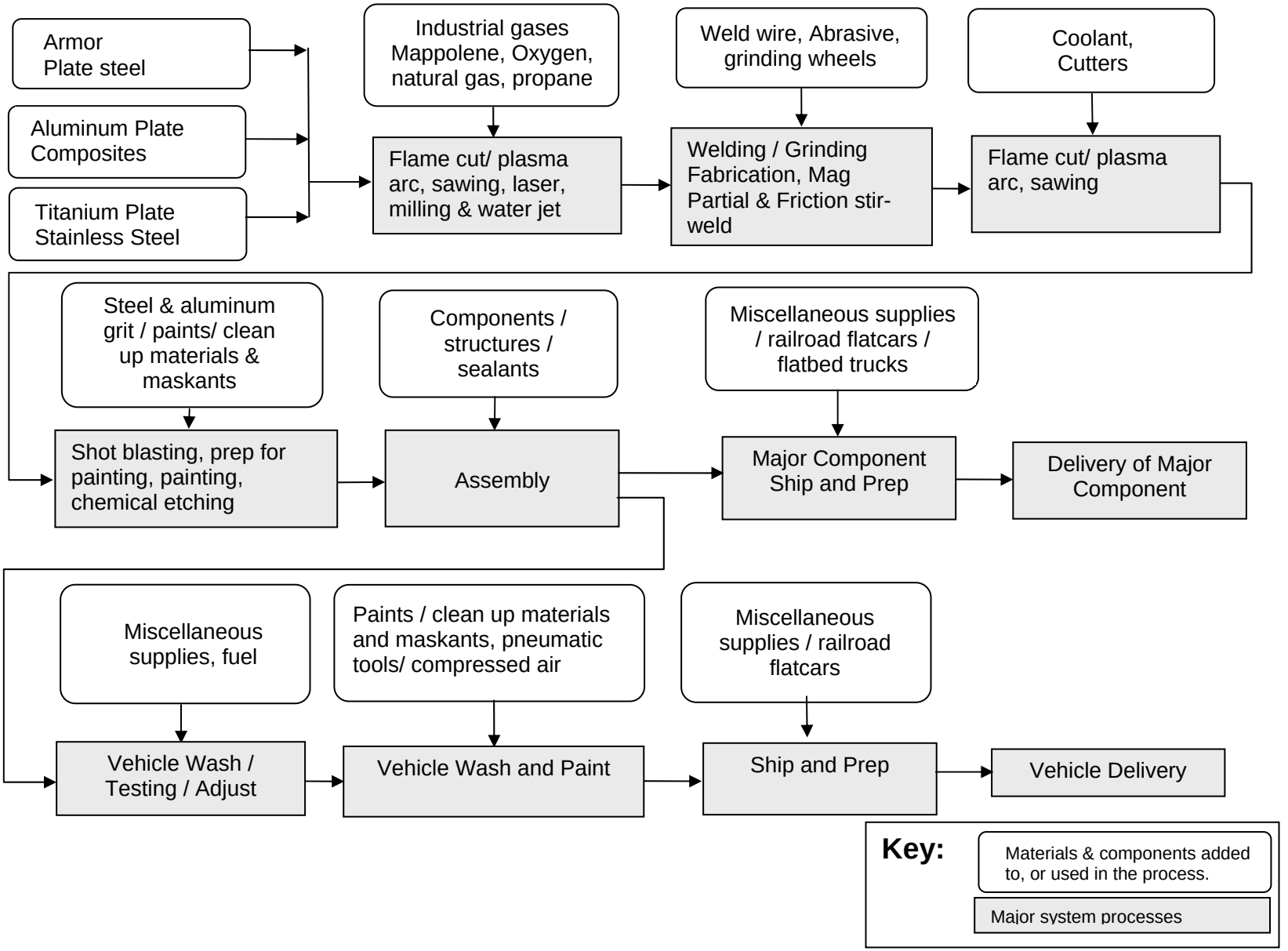
2.5 FABRICATION, MANUFACTURING AND ASSEMBLY PROCESSES

2.5.1 Introduction

The major processes involved in manufacturing weapon system platforms and military combat vehicles at JSMC-Lima are illustrated in the flow diagram in Figure 2.2. The process is similar for both the manufacturing of a complete and deliverable product (e.g., M1 Abrams tank), and for production of major components used in final assembly elsewhere (e.g., upper hull of the Stryker vehicle).

The following paragraphs describe the processes involved in the manufacturing operations of weapons systems platforms.

Figure 2.2. Fabrication/Manufacturing Process Flow Diagram



All the processes described here are performed in compliance of applicable regulations under the Occupational Safety and Health Administration (OSHA). All processes described here, except vehicle testing, occur within the confines of existing buildings.

2.5.2 Forming. Cold forming is a manufacturing process in which metal is shaped at ambient temperature to produce metal components to a close tolerance and net shape. Techniques include bending, cold drawing, and cold beading, all without removal of the material. A piece of metal is placed in a die and punch pressed into the blank to cold-form the part. The blank then takes on the form of the punch and the die. Under extreme pressure, many metals can be formed into new shapes without heat or cutting. The process is low in energy consumption and produces little or no waste.

2.5.3 Cutting. The purpose of cutting is to make a piece of metal fit specific dimensions and shapes. This is done by a number of different methods, described below.

Saws. Saws are used for shaping metal. Similar to milling (see section 2.5.4) it is common to apply a cutting fluid to reduce friction and keep the both the blade and the workpiece cool. The cutting fluid is a water-based synthetic material. The cutting fluid is filtered and recycled within the milling machine until it is determined to no longer be effective, at which point it is disposed of as non-hazardous solid waste. The metal shavings from the process are separated from the cutting fluid and disposed of as non-hazardous solid waste or recycled.

Water Jet. This uses high-pressure (approximately 25,000 psi) water with an abrasive material to cut various metals such as titanium, aluminum, and steel. The abrasive material is a garnet, a coarse mineral that combined with the high pressure water helps to cut the metal. The water and abrasive materials are collected and separated by filtration and reused. The abrasive material after several applications loses its abrasive quality at which point it is collected and disposed of as non-hazardous solid waste or recycled.

Oxy-fuel. This process uses oxygen plus a fuel to burn the steel. In Oxy-fuel cutting, a cutting torch is used to heat up ferrous metal to kindling temperature (about 980°C). A stream of pure oxygen is trained on the hot metal which chemically combines with the iron and flows out of the cut as an iron-oxide slag. The slag waste material is collected and disposed of as non-hazardous solid waste or recycled.

Plasma. Plasma cutting is a process that is used to cut steel and other metals using a plasma torch. In this process, an inert gas (in some units, compressed air) is blown at high speed out of a nozzle; at the same time an electrical arc is formed through that gas from the nozzle to the surface being cut, turning some of that gas to plasma. The plasma is sufficiently hot to melt the metal being cut and

moves fast enough to blow molten metal away from the cut. Plasma is an effective means of cutting thin and thick materials alike. Hand-held torches can usually cut up to 2 in (48 mm) thick steel plate. Stronger computer-controlled torches can pierce and cut steel up to 12 inches (300 mm) thick. Formerly, plasma cutters could only work on conductive materials, however new technologies allow the plasma ignition arc to be enclosed within the nozzle thus allowing the cutter to be used for non-conductive workpieces (i.e., aluminum). Since plasma cutters produce a very hot and very localized 'cone' to cut with, they are extremely useful for cutting sheet metal in curved or angled shapes.

Laser. This technology uses a laser to cut materials, and is usually used in industrial manufacturing. Laser cutting works by directing the output of a high power laser, by computer, at the material to be cut. The material then melts, burns, vaporizes away, or is blown away by a jet of gas, leaving an edge with a high quality surface finish. Industrial laser cutters are used to cut flat-sheet material as well as structural and piping materials.

2.5.4 Milling. Milling is used for the complex shaping of metal. Its basic form is that of a rotating cutter, or endmill, which rotates about the spindle axis (similar to a drill), and a movable table to which the workpiece is affixed. The cutting tool generally remains stationary (except for its rotation) while the workpiece moves to accomplish the cutting action. Milling machines at JSMC-Lima are computer controlled. A cutting fluid is applied during the process to both reduce the friction and keep both the milling tool and the workpiece cool. The cutting fluid is a water-based synthetic material and is filtered and recycled within the milling machine. Through normal use, the coolant becomes contaminated with metal shavings and hydraulic oil from the milling machine. At this point, the cutting fluid is collected, filtered and disposed of as non-hazardous solid waste. The metal shavings from the process are separated from the cutting fluid and disposed of as non-hazardous solid waste or recycled.

2.5.5 Welding. Welding is a fabrication process that joins metals by coalescence. This is often done by melting the workpieces and adding a filler material to form a pool of molten material (the *weld puddle*) that cools to become a strong joint, with pressure sometimes used in conjunction with heat, or by itself, to produce the weld. This is in contrast with soldering and brazing, which involve melting a lower-melting-point material between the workpieces to form a bond between them, without melting the workpieces.

Friction Stir Welding. This process involves the joining of metals without fusion or filler materials. It is used for the joining of structural components made of aluminum and its alloys. It has been convincingly demonstrated that the process results in strong and ductile joints, sometimes in systems which have proved difficult using conventional welding techniques. The process is most suitable for components which are flat and long (plates and sheets) but can be adapted for pipes, hollow sections and positional welding. The welds are created by the

combined action of frictional heating and mechanical deformation due to a rotating tool. The maximum temperature reached is of the order of 0.8 of the melting temperature (University of Cambridge, 2008).

2.5.6 Cleaning.

Several processes are used to clean metal in preparation for both welding and painting and are described below:.

Shot-blasting. Shot blasting, also known as bead blasting or sand blasting, is a generic term for the process of smoothing, shaping and cleaning a hard surface by forcing solid particles across that surface under air pressure. The effect is similar to sandpaper but provides a more even finish with no problems at corners or crevices. Materials used for shot blasting include steel grit, glass beads (bead blasting), garnet, and powdered abrasives of various grades. The purpose of shot blasting is to clean a metal surface to prepare it for welding or painting.

Grinding. This is the process of using an abrasive wheel to remove oxidation from the surface to prepare it for welding. This is similar to sanding.

Wash stations. The purpose of the wash station is to wash residual coolant, dirt or other materials from the metal surface that could compromise the integrity of the paint finish on the metal. Wastewater is discharged into to the sanitary sewer system (See Section 4.14).

2.5.7 Painting. Painting is the process of applying a surface coating for the purpose of reducing oxidation to the metal structure. To paint aluminum, the surface must be “etched” to improve the adhesion of the paint. Etching serves the same purpose of shot blasting on steel. Etching on aluminum is accomplished with a liquid application, and is called a chemical conversion process. Painting is performed in state-of-the art spray booths. Spray booths are identified, and operations authorized, under the installation’s Title V Air Quality permit (Section 4.11)

2.5.8 Assembly. This is the process of integrating component parts to produce an end item, primarily by bolt assembly to create a higher-level end item. Final assembly of vehicles requires addition of crankcase oil, hydraulic fluids, greases and fuel to the vehicle. Halon gas may be used for fire suppression. The process uses cadmium-plated fasteners. Cadmium is used for corrosion resistance.

2.5.9 Inspection. This process is used to look for surface defects and cracks. One process is to pour a dye onto the welded seam. It seeps into any surface imperfection. The dye is wiped off with a solvent and a powder is put onto the seam. Imperfections in a weld are detected when the dye seeps out of a crack via capillary action and stains the powder.

The inspection process can use x-rays. The x-rays are taken onsite but the film is processed by a contractor outside the facility. This is done on a small, statistically calculated sample of critical welds.

2.5.10 Vehicle testing. JSMC-Lima conducts numerous operational tests on the M1 Abrams tank before it is shipped off the facility. The vehicle testing facility consists of a 1.21-mile oval track of specially constructed asphalt with a 0.75 mile diagonal bisector with concrete turning islands and pivot pads. The track width ranges from 59.0 feet on straight-aways to 61.2 feet in curves.

2.6 ALTERNATIVES CONSIDERED

This section describes the alternatives being considered to address the purpose and need.

2.6.1 The No Action Alternative

Under the no action alternative, JSMC-Lima would maintain the status quo for manufacturing operations for existing weapon system platforms. JSMC-Lima would maintain the current level of manufacturing operations.

2.6.2 The Preferred Alternative

Under this alternative, JSMC-Lima would modify existing processes and/or facilities to manufacturing operations of weapon systems, or fabricate major components for weapons systems or vehicles for assembly at other locations.

JSMC –Lima, in support of the DoD, would modify existing processes and/or facilities to support manufacturing operations of weapon systems, or fabricate and assemble major components for weapons systems or vehicles for final assembly at other locations. JSMC-Lima would perform a risk assessment on the fabrication, assembly and testing requirements for proposed programs and identify required mitigation measures. This is the preferred alternative.

2.7 VALUED ENVIRONMENTAL COMPONENTS

This section lists the valued environmental components (VEC) that will be reviewed and discussed in this Programmatic Environmental Assessment. Discussion in Section 4 will focus on the existing conditions for each VEC. Section 5 will provide discussion of the potential effects of implementing the No Action alternative and the preferred alternative.

- Facilities
- Airspace

- Cultural Resources
- Natural Resources
- Threatened and Endangered Species
- Noise
- Wetlands
- Topography/Soils
- Hazardous Materials and Hazardous Waste
- Air Quality
- Land Use
- Socioeconomics and Environmental Justice
- Water Resources
- Soil Erosion
- Energy
- Traffic and Transportation

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SECTION 3.0: ENVIRONMENTAL CONDITIONS

3.1 INTRODUCTION

This section provides a description of the facilities and environmental conditions at JSMC-Lima.

3.2 JSMC-LIMA FACILITIES

JSMC-Lima is a Government-Owned, Contractor-Operated (GOCO) facility designed for the fabrication, assembly and testing of the full spectrum of armored combat vehicles and weapon systems platforms for the DOD. JSMC-Lima complex is located within Shawnee Township, Allen County, Ohio, approximately three miles south of the Lima City center. Figure 3.1 shows the location of the JSMC-Lima complex in relation to the City of Lima. The complex encompasses 369 acres, on which are located buildings, parking and related transportation infrastructure, a vehicle test track, a material storage area, a wooded picnic area and three small ponds used for recreation.

Figure 3.1 JSMC-Lima and Lima, Ohio area*

Source: http://maps.google.com

* Note: Map pre-dates official change of Lima Ordnance Modification Center to Joint Systems Manufacturing Center-Lima.

The JSMC-Lima is a state-of-the-art facility for metal fabrication, assembly, manufacturing and testing combat vehicles for the DoD. Appendix C provides a detailed discussion of the JSMC-Lima facility. The information in this appendix was prepared by General Dynamics, the facility's operating contractor. The JSMC-Lima built a test track to test-drive the M1 Abrams tanks it produced before delivering them to the Army. The track and associated features were designed specifically for the M1 Abrams Tank.

The JSMC-Lima has a steam-generation facility with three coal-fired boilers, and one natural gas-fired boiler. These boilers generate steam and provide approximately 99% of the heat for facility buildings, hot water and the paint drying oven located in building 281. Particulate emissions from the coal-fired boilers are controlled by a baghouse. Emissions from the boilers are regulated by a permit issued under Title V of the Clean Air Act, under the authority of the State of Ohio Environmental Protection Agency (Ohio EPA, 2002).

The JSMC-Lima facility has an asphalt-paved, striped, drained, and lighted parking area provided for all employees. The facility has approximately 1,282 parking spaces in the main parking lot which is located outside of the security-controlled area (General Dynamics, 2005). Previously, when the facility employed approximately 4,000 people a paved area on the southern portion of the installation was used for overflow employee parking (Lane, 2007).

3.3 AIRSPACE

Airspace is defined in vertical and horizontal dimensions and by time, and is a finite resource that must be managed to insure equitable allocation among commercial, general aviation and military needs. The JSMC-Lima facility has no aircraft facilities, and has no heliport. The Lima Allen County Airport is located approximately 5.5 miles east of JSMC-Lima. The City of Lima, to include JSMC-Lima and the Lima-Allen County Airport are in airspace designated as general, uncontrolled airspace, designated G (Ford, 2008).

3.4 CULTURAL and HISTORICAL RESOURCES

The Ohio State Historical Preservation Office has stated that no cultural sites are located on JSMC-Lima property (Kitchen, 1991). A copy of this correspondence is provided in Appendix D (Page D-2). A study in 1984 determined there were no historic sites on JSMC-Lima property (Building Technology, 1984). A copy of the title page and executive summary of this report are provided on Pages D-3 and D-4 of Appendix D.

3.5 NATURAL RESOURCES

A Forest inventory conducted in 2006 identified 12 distinct stands of trees (Whiteman, 2006). A stand is defined as a contiguous group of trees sufficiently

uniform in species composition, arrangement of size classes and condition to be a homogeneous and distinguishable unit. The 12 stands of forest total 85.3 acres and range in size from 0.9 to 40.7 acres. A map of the identified stands of forest on JSMC-Lima is provided in Figure B.1, Appendix B. The forested area on the facility provides a visual barrier, noise barrier, wind breaks and wildlife habitat. The overall health of the forested areas is good. There is little evidence of damage by either insect or disease. Mortality was minimal and widely scattered, likely caused by competition with other trees for growing space, sun light, water and nutrients (Whiteman, 2006).

Three small ponds on the installation, totaling 6.8 acres, constitute the water resources on the installation. The three ponds, referred to as Lakes Denny, Ketelsen and McDonald are shown in Figure B.1, Appendix B.

3.6 THREATENED AND ENDANGERED SPECIES

The Ohio Department of Natural Resources reported that based on a review of Natural Heritage maps and files there are no records of rare or endangered species in the area of JSMC-Lima, nor in a one-mile radius around the facility. There are no existing or proposed state nature preserves or scenic rivers at JSMC-Lima. The Ohio Department of Natural Resources also stated they were unaware of any unique ecological sites, geologic features, breeding or non-breeding animal concentrations, champion trees, state parks, forests or wildlife areas within a one-mile radius of the JSMC-Lima facility (Ohio Department of Natural Resources, 2004). In addition, no plant or animal species listed as threatened or endangered by the U.S. Fish and Wildlife Service or the Ohio Department of Natural resources is known to occur on, or adjacent to, JSMC-Lima (Whiteman, 2006). A copy of that correspondence is available at Exhibit D.3, Appendix D.

3.7 NOISE

Noise effects are generated by two categories of actions at JSMC-Lima. Primary noise generation on JSMC-Lima consists of that generated by (1) manufacturing operations that take place inside existing facilities, and (2) operating vehicles on the JSMC-Lima test track.

The Ohio Bureau of Worker's Compensation conducted a noise dosimetry study in 1995 to assess the employee's exposure to noise at JSMC-Lima. That study was supplemented in 1998 in a study commissioned by General Dynamics, the facility's operating contractor. Results of both studies indicate that certain jobs may results in noise exposures exceeding the Occupational Safety and Health Administration (OSHA) PEL of 90 dBA and the OSHA "Action level" of 85 dBA. General Dynamics instituted a hearing conservation program as required by OSHA. Hearing protection is required in many areas of JSMC-Lima.

Outdoor noise is generated during operation of the vehicles, primarily the M1 Abrams tank, on the JSMC-Lima test track. Mitigation measures were incorporated in the design and construction of the test track, which included a noise buffer wall on the southern portion of the test track. This wall deflects a portion of the noise that could affect nearby residents and visitors of Heritage Metro Park, which are located adjacent to the southern boundary of JSMC-Lima.

3.8 WETLANDS

A Wetlands delineation study was conducted on JSMC-Lima in 1997 (Lichvar and Sprecher, 1997). The study identified 27 wetlands, three (3) lakes, and 2,303 feet of abandoned ditches. The wetlands encompass a total of 4.55 acres, and the lakes encompass 6.80 acres. The parcels of land containing the lakes, wetlands and ditches are in the test track area and the forested area located on the southern boundary of the facility (Figure B.2, Appendix B). Previously this area was used for farming but is now mostly forested or in varying stages of succession with young trees located on gently undulating glacial till. Drainage in this area has been disturbed; drainage on the test track is currently almost entirely artificial. Precipitation is the only source of water for wetlands in the test track area. Drainage ditches and culverts leading off the site are operating less than perfectly, so water is impounded (Lichver and Sprecher, 1997).

3.9 TOPOGRAPHY AND SOILS

Topography of JSMC-Lima complex is generally flat to gently rolling with slopes ranging from 2 to 6 percent. The average elevation is 864 feet above mean sea level and varies less than 20 feet across the entire complex. The common soil types are Blount silt loam, Pewamo silty clay loam and Morley silt loam. The Blount and Pewamo soil types are poorly drained, while the Morley soil type is moderately well drained (Whiteman, 2006).

3.10 HAZARDOUS MATERIAL AND HAZARDOUS WASTE

The Ohio Environmental Protection Agency (Ohio EPA) issued JSMC-Lima a permit, under the authority of the Resource Conservation and Recovery Act (RCRA), Subtitle C, for generation of Hazardous Waste (Ohio EPA, 2004). The Environmental Protection Agency Identification Number (EPA ID) for JSMC-Lima is OH7210020510. JSMC-Lima is identified as a Large Quantity Generator, creating greater than 1,000 kilograms/month (2,200 lbs/month) of non-acute hazardous waste. JSMC-Lima is not authorized to store or accumulate hazardous waste for more than 90 days onsite. All hazardous waste generated by JSMC-Lima is shipped off-site in less than 90 days by a contractor licensed to transport and dispose off hazardous waste at a licensed hazardous waste disposal facility.

Manufacturing operations at JSMC-Lima generates hazardous wastes including paint, solvents, corrosives, and waste oil. Facilities that generate hazardous waste include paint booths and paint mix room, boilers, and to a lesser extent, flame cut, welding and grinding operations, shot blast units, and fueling station. Petroleum-based lubricating oils and greases, solvents, and paint-related wastes comprise the majority of hazardous waste. All hazardous waste is managed in accordance with applicable laws and regulations and shipped, via licensed hazardous waste contractors, to properly licensed disposal facilities.

3.11 AIR QUALITY

As a result of actions taken on behalf of the Clean Air Act and revisions to the National Ambient Air Quality Standards (NAAQS), the US Environmental Protection Agency determined in 2004 that Allen County was in non-attainment for ground-level ozone. For the 2003 through 2005 period, the community was able to demonstrate that the 3-year average of the fourth highest daily maximum 8-hour ozone concentration did not exceed 0.08 parts per million; Allen County successfully demonstrated that it had not exceeded the NAAQS standard for the 2003 through 2005 period. Allen county is currently in a maintenance status for ozone, and is in an attainment status for the other six priority pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter ≤ 2.5 µm ($PM_{2.5}$), particulate matter ≤ 10 µm (PM_{10}) and lead (Lima-Allen County Regional Planning Commission, (2007; Mazur, 2008).

The JSMC-Lima operates under the provisions of a Title V permit issued by the Ohio Environmental Protection Agency (Ohio EPA, 2008). This permit authorizes the JSMC-Lima to operate a broad range of systems that include, for example, the coal-fired boilers, air makeup heaters, paint booths, shot blast operations and parts washers. The complete list of air sources at JSMC-Lima is available in Appendix D.

3.12 LAND USE

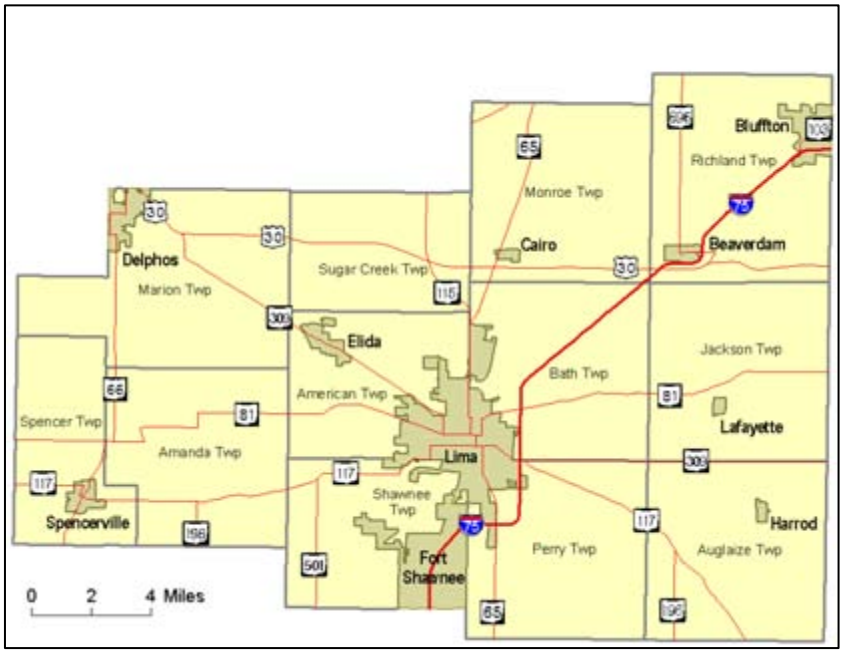
Allen County comprises 404.5 square miles in northwestern Ohio. Table 3.1 shows the distribution of land by type in Allen County. Figure 3.2 shows Allen County population centers and major roadways.

Table 3.1 Distribution of land use in Allen County, OH

Land use	**Percent of total**	**Square miles**
Urban	17.76	71.84
Cropland	65.96	266.81
Pasture	4.26	17.23
Forest	8.18	33.09
Open water	1.03	4.17
Wetlands	2.73	11.04
Bare/mines	0.07	0.28
total	99.99	404.46

Source: Ohio Department of Development, 2008

Figure 3.2 Allen County, OH



Source: Ohio Department of Development, 2008

Over the last 30 years, land use conversion in Allen County has largely been confined to the Lima Urbanized Area. However, low-density residential strip developments are evident throughout the County. Major residential subdivision developments have occurred exclusively within the urbanized areas, nearly all within 3 miles of the City of Lima.

The 369-acre JSMC-Lima facility is located in Shawnee Township, approximately three miles south of the Lima, Ohio city center, and is part of the 71.84 square miles of urban land use (Table 3.1). The JSMC-Lima site is zoned for industrial uses. The land east of the facility is also zoned industrial, as well as a large majority of the lands to the northwest, opposite the Norfolk Southern rail line,. The land along the southern boundary of the facility is zoned for recreational, agricultural and residential uses (Figure B.3, Appendix B). A portion of the JSMC-Lima's forested area (Figure B.1, Appendix B) serves as a buffer between the manufacturing facilities and the residential properties located to the south.

The distance between the test track and residential uses is approximately 0.20 miles (1050 ft.); between the production buildings the distance is approximately 0.6 miles (3,280 ft). The 83.8-acre parcel of land adjacent to JSMC-Lima's southern boundary and bounded by Reed Road was previously owned by the US Government, and was deeded to Johnny Appleseed Park District with the provision that the US Army can reclaim it. This area is currently designated as the Heritage Metro Park and contains facilities for picnicking, hiking, mountain

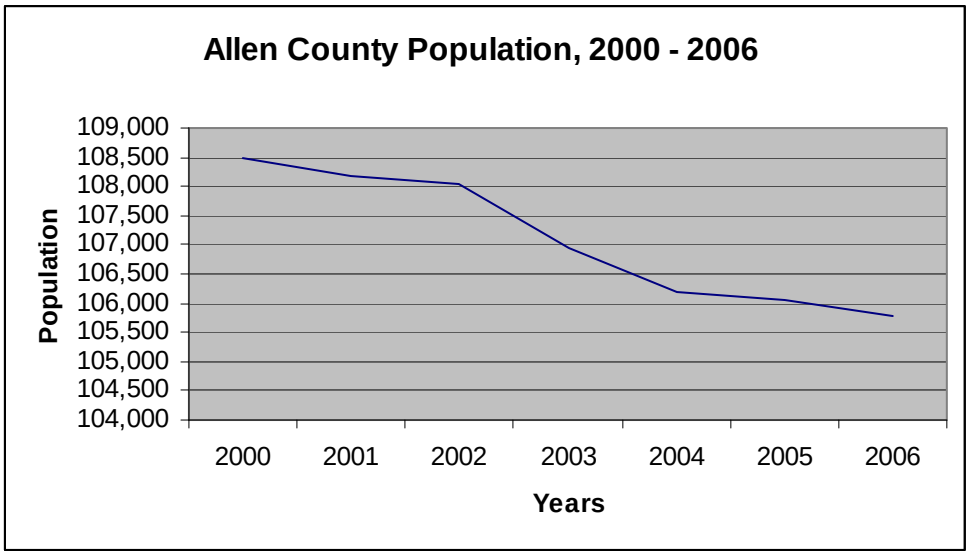
biking, fishing, and nature study (Clayton Group, 2004; Johnny Appleseed Park District, 2008).

3.13 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

The principal mechanism for Army socioeconomic effects are Army expenditures and changes in population or employment at Army facilities/installations.

Allen County's population peaked at 112,241 in 1980, and has been gradually declining since. Allen County's population decreased by 5.7 percent in the period between 1980 and 2006. Figure 3.3 shows the change in population during the period between 2000 and 2006.

Figure 3.3 Allen County Population, 2000-2006*



Source: Ohio Department of Development, 2008
* Estimated population for 2006

The City of Lima is the largest population center in Allen County. The city's estimated 2006 population was 38,219, down 4.6% from the 2000 population of 40,081 (Ohio County Profiles, 2008). Population in the State of Ohio has grown 5.41 percent over the same period (Lima-Allen County Regional Planning Commission, 2005).

The area's population growth has slowed and household size fallen. Consistent with national trends, the County's population is increasing in age and birth rates are falling. The median age of the population is 36.3 years. That compares with a median of 36.2 and 35.3 years with the State of Ohio and the United States respectively (Lima-Allen County Regional Planning Commission, 2007. Minority populations experienced growth (13.8%) over the same period, concentrated largely in the City of Lima (Lima-Allen County Regional Planning Commission, 2005).

The per capita personal income for Allen County residents increased 37 percent over the 10-year period ending in 2005 at $27,382. Of the 44,245 housing units in the county, 40,646 are occupied; 66% of which are owner-occupied, 26% are renter occupied, and 8% are vacant. The median monthly owners cost, which includes a mortgage, is $774. Approximately 24% of these housing units were built before 1939. The median age of construction is 1959. From a sample of 25,032 owner-occupied housing units, the median value was $81,800. From a sample of renter-occupied housing, the median gross rent was $446 (Ohio Department of Development, 2008).

The service industry has the single largest category of employees in Allen County with 40,020 employees; manufacturing is second with 24,885. Since 1980 the number of employees in the manufacturing sector has generally held steady in the range of 21,000 to 23,000. General Dynamics, Land Systems Division is the fourth largest employer and the second largest employer in the manufacturing sector in Allen County (Allen Economic Development Group, 2008).

Unemployment in Allen County has increased somewhat between 1999 and 2006 (Table 3.2). Employment in Allen County's manufacturing sector decreased by 528 jobs, a loss of 4.4 percent between 2000 and 2005. The proportion of manufacturing jobs to all jobs fell from 22.9 percent in 2000 to 19.7 percent in 2005. Statewide, manufacturing jobs represented 19.8 percent of all non-agricultural employment in 2000. State-level data from 2005 was unavailable for comparison purposes (Lima-Allen County Regional Planning Commission, 2007).

Table 3.2 Average Unemployment, Allen County, OH, 1999 – 2006

Year	1999	2000	2001	2002	2003	2004	2005	2006*
Avg. Unemployment	4.7%	4.7%	5.1%	6.5%	7.0%	6.6%	6.2%	6.1%

Source: Allen County Development Group, 2008.
* estimate

Allen County income has continued to lag behind that of State and national income trend lines. The median household income gap as identified in 1990 was 5.6 percent and 9.7 percent respectively. The gap nearly doubled when comparing median household income to the State in the 2000 Census (8.7%). The gap nationally was 11.8 percent. Median family income in Allen County was 89.4 percent of Ohio's median family income in 1999 and 89.4 percent of the national median income. The median non-family income was 85.0 percent of the State's median value and about 79.5 percent of the entire nation. In 1999 Allen County per capita income was 83.4 percent of that in Ohio and 81.11 percent of the national figure (Lima-Allen County Regional Planning Commission, 2007).

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies. Executive Order 12898 (Executive Office of The President, 1994) directs federal agencies to make achieving environmental justice part of their missions by identifying and addressing disproportionately high and adverse effects of agency programs, policies, and activities on minority and low-income populations (US Department of Energy, 1998).

Census Track 119 encompasses JSMC-Lima and the populated area nearest the facility. Figure B.4, Appendix B, shows the geographic area of this census track. Demographic information about this population is provided in Table 3.3.

Table 3.3 Demographics of census tract 119, Allen County, OH

Category	Data
Population by education	
Less than 12th grade education (no diploma)	10.1%
High school (or equivalency)	47.2%
Some college (including Associate degree)	31.4%
Bachelor's degree	6.9%
Graduate or professional degree	4.4%
Median Household income	$46,723
Median Family income	$52,072
Families with income below poverty level	2.4%
Population by race	
Caucasian/white	93.8%
Black/African American	3.6%
Hispanic/Latino	1.4%
Other (e.g., Asian, American Indian, Alaska Native)	1.2%

Source: Census Bureau, 2008

Information available from the US Census Bureau indicates the population in census tract 119 is largely Caucasian (93.8%), has a relatively high level of education (89.9% high school graduates), and a median household income of $46,723, with 2.4% of the families with income below the poverty level (Census Bureau, 2008).

3.14 WATER RESOURCES

Water resources are inclusive of surface water, such as streams, lakes, rivers, groundwater and floodplains, as well as effect on water quantities, usage patterns, and water-related compliance issues, to include stormwater and wastewater.

The City of Lima's water treatment facility is the source of potable water for JSMC-Lima. The Lima Water Treatment Plant receives raw water from four above-ground reservoirs. Water from the Auglaize River, west of Lima, is used to fill the 4.9 billion gallon Bresler Lake Reservoir. On the east side, a complex consisting of the Ferguson Reservoir, Metzger Lake and Lost Creek Reservoir are supplied by water from the Ottawa River. The total storage capacity of the east side complex is approximately 4.0 billion gallons (City of Lima, 2008a). The City of Lima's water treatment system has a design capacity of 30 million gallons per day (MGD) and has an annual average production rate of approximately 15 MGD (Colasanti, 2008). In 2001 JSMC-Lima used 23,581,608 gallons of potable water, which equates to approximately 90,700 gallons per workday (0.09 MGD). This calculation used a 260-day work year based on 52, five-day weeks

The JSMC-Lima facility has a gravity-based sewage collection system, augmented by lift stations that send sewage to the City of Lima's sewer system. The JSMC-Lima is authorized, under a permit issued by the City of Lima, to discharge industrial wastewater into the city's sanitary sewer system (City of Lima, 2005). In 2001 the facility discharged 35,643,973 gallons of sewage/industrial wastewater, or an average of 137,092 gallons per weekday (0.137 MGD). This average was calculated, using 260 weekdays per year, under the assumption that wastewater discharge from JSMC-Lima on weekends is negligible. The City of Lima's wastewater treatment plant was expanded in 1973 to an average dry weather flow capacity of 18.5 million gallons per day (MGD), and a peak flow capacity of 53.0 MGD. The design concept called for secondary and advanced treatment portions of the plant to operate at a peak rate of 33.0 MGD, with any remaining flow receiving primary settling and chlorination. Since 1973 the plant has provided primary, secondary and tertiary treatment, as well as biosolids recycling (City of Lima, 2008b). The City of Lima wastewater treatment plant daily treats from 9 to 13 MGD. Plans are currently underway to increase the capacity of the wastewater treatment plant to 70 MGD. Construction is scheduled to be complete in the summer of 2010 (Leimeister, 2008).

Wastewater from the Final Prep and Ship Building at JSMC-Lima, is limited to that generated in the building's restrooms. This wastewater flows by gravity to Shawnee #2 wastewater treatment plant, part of the Allen County Sanitary District. The District's Shawnee #2 wastewater treatment plant has a capacity of 2.0 MGD, and during calendar year 2007 treated an average of 2.04 MGD. The Shawnee #2 wastewater treatment plant is at its design capacity. Current engineering studies are underway to identify potential refinements of the treatment process, as well as capitol improvements to increase the treatment plant's capacity. This effort should be complete in approximately three years (Mathew, 2008).

The relatively flat topography and riverine system of Allen County, coupled with the local climate and moderate precipitation, result in localized flooding and

seasonal ponding. Given the community's relative position with respect to other West Central Ohio counties in the Maumee River watershed, the community occasionally experiences severe flooding. The JSMC-Lima is within the Ottawa River watershed. The JSMC-Lima facility lies outside the 100-year floodplain zone for the Ottawa River (Ottawa River Coalition, 2008).

The Ohio Environmental Protection Agency (Ohio EPA) has issued a National Pollution Discharge Elimination System (NPDES) permit authorizing JSMC-Lima stormwater discharge from 13 discrete points into the Ottawa River via an unnamed tributary (Ohio EPA, 2003).

3.15 ENERGY

Energy requirements for JSMC-Lima consists of electricity, natural gas, coal, and petroleum fuels (gasoline, diesel fuel). Electric power is used for lighting and to power much of the machinery, motors, and equipment used in the fabrication, assembly and manufacturing processes. Natural gas and coal are required for the four steam-generating boilers which are used for comfort heat and heat for paint booth operations. Gasoline and diesel fuel are required for use of support vehicles and vehicle testing.

The JSMC-Lima facility receives 138,000 volt AC input from American Electric Power Company. The power is stepped down to 13,800 volt AC before being fed underground to the five (5) major electrical substations on the facility. Each of the five substations distributes 480-volt AC throughout the facility. In 2001, the facility used 36,456,000 KW of electricity.

The facility receives natural gas through a 6-inch pipe at 40 psi. In 2001, the facility used 39,325,000 cubic feet of natural gas.

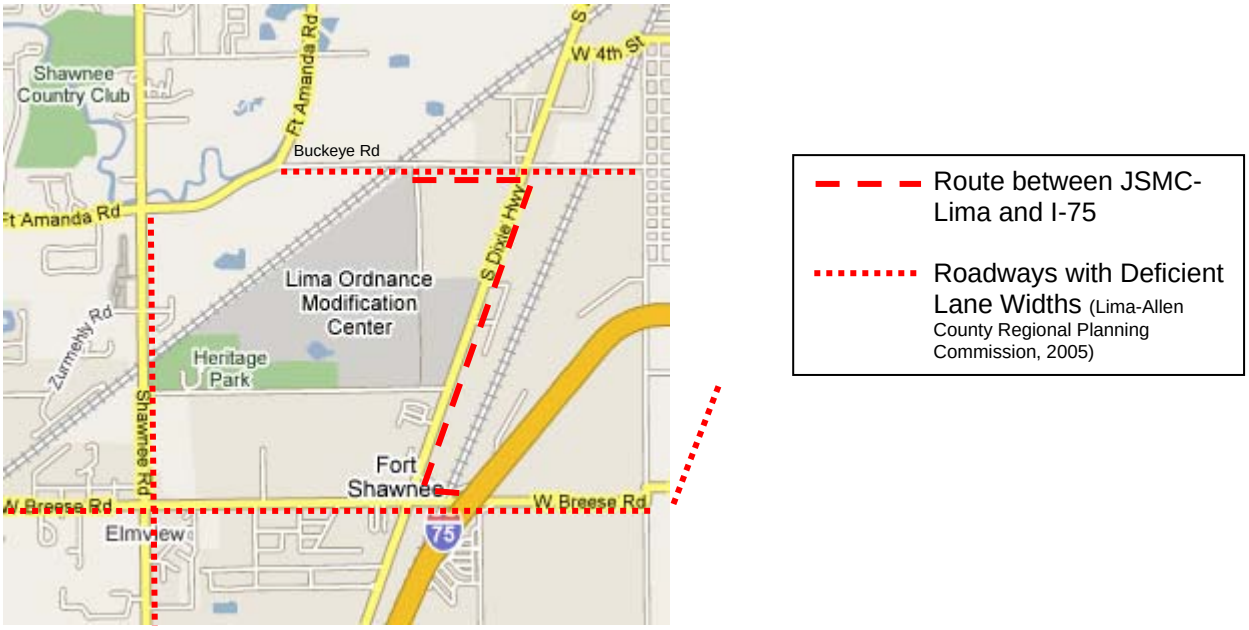
The JSMC-Lima facility has its own steam plant which is primarily used to heat buildings. The steam plant has four boilers; three burn coal and a fourth burns natural gas. The three coal burners are rated at 50,000, 50,500 and 75,000 pounds of steam per hour. The gas-fired boiler is rated at 60,000 pounds of steam per hour (Appendix C). The natural gas-fired burner operates year-round to provide heat for the JSMC-Lima paint booths. The coal-fired boilers operate during cold-weather periods to provide comfort heat for the JSMC-Lima buildings. Coal for the boilers is stored on a concrete slab, curbed with a rainwater collection system. Stormwater runoff from the coal piles is directed to two settling cells with a capacity of 60,000 gallons each for retention of a 10-year, 24-hour storm event allow for settling of particulate (General Dynamics, 2007).

3.16 TRAFFIC AND TRANSPORTATION

The JSMC-Lima facility is centrally located in a network of arterial roadways that connect to state and interstate highways. JSMC-Lima is 0.5 miles from South

Dixie Highway, a minor north-south arterial in Lima, and less than 2.5 miles from an interchange with I-75, a major north-south interstate highway (Figure 3.4).

Figure 3.4 Road Network near JSMC-Lima*



Source: www.maps.google.com
* Note: Map pre-dates Lima Ordnance Modification Center's name change to Joint Systems Manufacturing Center-Lima

The I-75 corridor is a major north-south interstate that passes through Allen County on the east side of the City of Lima. To the north, I-75 links the community to cities such as Toledo and Detroit while to the south Dayton, Lexington, Atlanta and Miami can be directly reached via I-75. Another major roadway located just north of the City of Lima is US 30. This east-west route links the Lima Urbanized Area with Chicago to the west and Pittsburgh and Philadelphia to the east. In addition to I-75 and US 30, Allen County is serviced by five major state routes: SR 309, SR 117, SR 81, SR 65 and SR 66 (Figure B.5, Appendix B). This highway system supplies a solid network for the movement of goods and people within the region (Lima-Allen County Regional Planning Commission, 2005).

The road network in the vicinity of JSMC-Lima is characterized as urban arterials. Several of the roadways in and around Lima have been identified, using the Federal Functional Classification System, as compromising system efficiency and safety. Several roadways near JSMC-Lima, Buckeye Road, Breese Road and Shawnee Road, and portions of South Dixie Highway were identified as having deficient lane widths (See Figure 3.4) (Lima-Allen County Regional Planning Commission, 2005).

Two segments of the roadways leading to, or near, JSMC-Lima have been identified with having a LOS rating below "C." LOS characterizes the operating conditions on the roadway in terms of traffic performance measures related to speed and travel time, freedom to maneuver, traffic interruptions and comfort and convenience. The LOS range from LOS-A (least congested) to LOS-F (most congested) (Transportation Research Board, 2000). Shawnee Road north of Fort Amanda Road has an LOS of "E," and West Breese Road between South Dixie Highway and I-75 has LOS rating of "F." (Lima Allen County Planning Commission, 2005) See Figure B.6, Appendix B.

Materials coming into and products coming out of JSMC-Lima are transported either by rail or by truck. The rail network supporting JSMC is discussed below. Virtually all truck traffic arrives via the Fort Shawnee exit on I-75 (Breese Road). The route between JSMC-Lima and this interchange covers a distance of 2.35 miles and is illustrated by the dashed line in Figure 3.4. Buckeye Road, Breese Road and South Dixie Highway south of Reed Road on the route between JSMC-Lima and I-75 were identified as having deficient lane widths, indicated by dotted lines in Figure 3.4. Truck traffic can have a disproportionate influence on LOS on two-lane roads with inclines. The route between JSMC-Lima and I-75 is virtually flat and under such conditions, truck traffic has the same effect on LOS as passenger cars (Transportation Research Board, 2000).

The Lima Allen County Regional Planning Commission has identified a number of roadway improvements and studies for the 2008 to 2011 timeframe. Among those, a study of the Shawnee Road corridor which would make recommendations to improve geometrics, ingress/egress, ease congestion and upgrade traffic control devices as necessary, and also replace the existing structure over the Ottawa River with a new wider structure. This study will include Shawnee Road from (a) Zurmehly Road to Adgate Road and (b) Ft. Amanda Road from Breezewood Lane to Buckeye Road. Ramp structure improvements have also been identified for the Breese Road interchange with I-75 (Lima Allen County Planning Commission, undated).

Allen County is serviced by both intra-city and intercity bus service. A full range of charter and taxi services, as well as, paratransit service providers are also available within the community. Bus services are provided by the Allen County Regional Transit Authority (ACRTA). The ACRTA operates six days a week. The ACRTA bus service does not include the area near JSMC-Lima. There is no passenger rail service for the City of Lima or Allen County.

The City of Lima and Allen County are served by four different rail freight carriers: CSX Transportation, Indiana and Ohio Railway, Norfolk-Southern and R.J. Corman Railroad. Two commercial rail carriers, CSX and Norfolk-Southern access the JSMC-Lima facility from opposite sides. These two rail services

interconnect within the Lima area with other major rail systems, providing nation-wide access. See Figure B.7, Appendix B.

SECTION 4.0: ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This PEA evaluates the potential environmental effects of implementing the proposed course of action. The PEA has considered several environmentally-related resource areas which, for purposes of evaluation, have been identified as program resources areas, and those areas eliminated from further consideration

4.2 RESOURCE AREAS ELIMINATED FROM FURTHER CONSIDERATION

Analysis of potential environmental effects associated with a Programmatic Environmental Assessment typically addresses numerous resource areas that may be affected by implementation of proposed actions. In the case of JSMC-Lima performing additional manufacturing and assembly of military weapons systems, certain environmental resource areas that typically receive attention have been initially examined and determined not to warrant further analysis. These areas include airspace, land use, wetlands, cultural resources, soil erosion, threatened and endangered species, and environmental justice. Each of these subject areas are discussed briefly as follows:

Airspace. JSMC-Lima has no facilities for aircraft operations. There is no heliport and no future plans exist to build one. Manufacturing operations at JSMC-Lima are limited to existing structures or the test track. The JSMC-Lima facility has no affect on the Lima Regional Airport, which is approximately 5.5 miles east of the facility.

Cultural and Historical Resources. The State Historical Preservation Office has stated that no culturally significant sites are present on JSMC-Lima property (Kitchen, 1991). A copy of this correspondence is available in Appendix D. A 1984 study determined there are no historically significant structures on JSMC-Lima property (Building Technology, 1984). A copy of the cover page and executive summary of this report are provided in Appendix D.

Threatened and Endangered Species. The Ohio Department of Natural Resources, reported that based on a review of Natural Heritage maps and files there are no records of rare, threatened or endangered species in the area of JSMC-Lima, to include a one-mile radius from the facility. There are no existing or proposed state nature preserves or scenic rivers at JSMC-Lima. The same office stated they were unaware of any unique ecological sites, geologic features, breeding or non-breeding animal concentrations, champion trees, or state parks, forests or wildlife areas within a one-mile radius of the JSMC-Lima facility (Ohio Department of Natural Resources, 2004). A copy of this correspondence is available in Exhibit D.3, Appendix D. Manufacturing operations at JSMC-Lima will have no effect on threatened or endangered species.

Soils and Soil Erosion. All actions associated with the fabrication, assembly and manufacturing of weapons system platforms, to include vehicle testing occurs within existing structures or on existing paved surfaces. Off-road vehicle operations do not take place on JSMC-Lima. There has been, as indicated by the construction of a new administrative building, some soil-disturbing construction at the facility. All such actions implement best management practices to control erosion and sediment runoff.

Land Use. The lands to the east, north and west of the JSMC-Lima facility is largely zoned for industrial uses. There are small parcels located northwest of the facility, opposite the Norfolk & Southern Rail line, zoned for commercial and for agricultural purposes. A mixture of park and residential land uses adjoin the southern boundary of the JSMC-Lima facility (Figure B.3, Appendix B). The forested area south of the manufacturing facilities and test track serves as a buffer to minimize noise, from affecting residential area south of the facility (Figure B.1, Appendix B). The distance between the test track and residential properties is approximately 0.20 miles (1050 ft.); between the production buildings and residential properties, the distance is approximately 0.6 miles (3,280 ft).

Natural Resources. Natural resources on JSMC-Lima consists of the established wooded area on the southern portion of the facility. There are no known endangered species on the JSMC-Lima facility or surrounding area. Water resources and wetlands are discussed later in this section. The forest study gave no indication that JSMC-Lima's industrial operations were affecting the health of the facility's forested areas (Whiteman, 2006). Increased operations for fabrication, assembly, manufacture and vehicle testing within existing facilities would have no effect on natural resources at JSMC-Lima.

Energy. Energy demand at JSMC-Lima would increase only incrementally with the additional missions to fabricate, manufacture, assemble, and test weapon systems or combat vehicles. The natural-gas fired boilers may increase their operations to small extent to meet additional demand for process steam. Electricity consumption may increase some to operate additional equipment. Electricity demand would increase more if additional shifts or weekend operations were required. There would likely be a nominal increase in consumption of petroleum fuels.

The existing energy infrastructure for electricity, natural gas and coal is capable of handling increased demand. The JSMC-Lima facility also has sufficient capacity for storage of petroleum fuels to meet additional mission requirements. The nominal increase in energy consumption resulting from increased manufacturing operations would have no effect on human health or the environment.

Water Resources. Additional missions to fabricate, assemble, manufacture and test weapons systems or vehicles would likely cause a slight increase in the demand for water. The City of Lima's water treatment facility has excess capacity to accommodate a significant increase in demand caused by manufacturing operations at JSMC-Lima. Similarly, the City of Lima's wastewater treatment plant has significant excess capacity to accommodate an increased discharge of wastewater caused by increased manufacturing operations at JSMC-Lima (See Section 4.14).

The wastewater from a restroom in building 281 is discharged to the Shawnee #2 wastewater treatment plant, part of the Allen County Sanitary System. This is an insignificant contribution to the total wastewater treated at Shawnee #2. Increase in fabrication, manufacturing and assembly at JSMC-Lima would have *de minimus* effect on wastewater flow to the Shawnee #2 treatment plant.

Wetlands. A wetlands delineation was performed at the JSMC-Lima in 1997. This study identified 11.35 acres of wetlands, including three (3) lakes, and abandoned ditches on two parcels of land totaling approximately 213 acres (Lichvar and Sprecher, 1997). Excluding the three lakes, totaling 6.802 acres,

Table 4.1. Acreages of Wetlands Delineated at JSMC-Lima

	160-acre test track parcel	53-acre parcel on SE corner of facility
Number of Wetlands	17	10
Total Wetland Acreage	3.943 acres	0.609 acres
Number of Lakes	3	0
Total Lake Acreage	6.802 acres	0
Number of ditches	3	1
Length of ditches	1166.38 feet	1136.76 feet
Total size	10.745 acres	0.609 acres

Reference: Lichvar and Sprecher, 1997, Table 1, page 6.

there are 27 delineated wetlands totaling 4.55 acres on the facility. The details of wetland resources on the facility are provided in Table 4.1. A map illustrating the location of the identified wetlands is provided in Figure B.2, Appendix B. The identified wetlands were present in the test track area and an adjacent parcel outside the facility's main manufacturing area. Both parcels are mostly forested or reverting old farm fields with young trees located on gently undulating glacial till with a thin loess cap. The three lakes on the facility total 6.8 acres.

Fabrication, assemble and testing of armored combat vehicles and weapon systems platforms within the confines of existing structures and facilities would not affect wetlands at the JSMC-Lima facility.

4.3 PROGRAM RESOURCE AREAS

A program resource area is a subject area that warrants further discussion because of the potential affect the proposed action may have on a valued environmental component. Resource areas in this category include:

- Air quality;
- Hazardous Materials and Hazardous Waste;
- Facilities and Infrastructure;
- Traffic and Transportation; and
- Socioeconomics;

4.4 AIR QUALITY

Currently, JSMC-Lima is a major source of criteria air pollutants (a result of the installation's coal-fired boilers) as well as a major source of hazardous air pollutants (HAP) (a result of the surface coating operations and the potential to emit more than 10 tons per year (tpy) of methyl isobutyl ketone/*MIBK*). As a major source of air pollutants, JSMC-Lima is required to maintain a Title V operating permit. Title V Permits include all air pollution requirements that apply to the installation, including emissions limits and monitoring, record keeping, and reporting requirements. As a result, any new sources of air emissions or extensive modification of JSMC-Lima's existing sources would require an analysis of the affects the change would have on the county's air quality.

The Clean Air Act (CAA), the primary federal statute regulating air emissions, applies fully to the Army and all its activities. The CAA categorizes regions of the United States as nonattainment areas if air quality within those areas does not meet the required ambient air quality levels set by the National Ambient Air Quality Standards (NAAQS). The NAAQS consist of primary and secondary standards for "criteria air pollutants": sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. The CAA establishes health-based standards for the nation's air quality. All areas of the country are monitored on a regular basis to determine if they continue to meet the NAAQS. A major factor to be considered when expanding current or adding a new mission is whether or not the installation is located in an attainment or nonattainment area. An installation in a nonattainment area is often subject to more stringent requirements than one located in an attainment area and may have additional requirements (i.e., adding additional controls, offsetting emissions increases) to overcome to expand current or add a new mission. As stated earlier in Section 4.11, Allen County, Ohio is currently in an attainment status for seven criteria pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, $PM_{2.5}$, PM_{10}, lead

and ozone. Installations with stationary sources located in attainment or maintenance areas and have the potential to emit (PTE) 100 tons per year (tpy) or more of any criteria pollutant are considered Major Sources and have an increased regulatory burden. As a result of the emissions resulting from operating its coal-fired boilers, JSMC-Lima is a major source of criteria air pollutants.

The CAA also requires the EPA to regulate emissions of hazardous air pollutants (HAPs) from a published list of industrial sources called "source categories." EPA has identified source categories that must meet certain technology requirements to control HAP emissions and is required to develop regulations for all industries that emit one or more of the HAPs in significant quantities. These standards are called the National Emissions Standards for Hazardous Air Pollutants (NESHAPs). These industry-based NESHAPs are also called Maximum Achievable Control Technology (MACT) standards. MACT standards are designed to reduce HAP emissions to a maximum achievable degree, taking into consideration the cost of reductions and other factors. Sources subject to MACT standards are classified as either major sources or area sources. Major sources are sources that emit 10 tons per year (tpy) of any of the listed HAPs, or 25 tpy year of a combination of HAPs. Currently, JSMC-Lima is permitted as a major source of HAP resulting from the potential to emit more than 10 tpy of MIBK.

In addition to ambient air and MACT standards, the CAA establishes standards and requirements to control other air pollution problems. The other major programs regulating emissions of air pollutants are an acid rain reduction program and a program to phase out the manufacture and use of ozone-depleting chemicals . The prevention of accidental release and minimization of consequences of any such release of extremely hazardous substances including, but not limited to, the substances published under the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 are also required under the CAA.

The CAA has historically regulated air pollution sources through three primary programs: (1) ambient air quality regulation of new and existing sources through emission limits contained in state implementation plans (SIPs); (2) more stringent control technology and permitting requirements for new sources; and (3) specific pollution problems, including hazardous air pollution and visibility impairment. The 1990 amendments to the CAA (CAAA-90) not only modified these three programs but also addressed new air pollutants and added a fourth category—a comprehensive operating permit program. The comprehensive operating permit program helps to establish in one place all CAA requirements that apply to a given stationary source of air emissions.

The CAA requires states to develop SIPs that establish requirements for the attainment of NAAQS within their geographic areas. SIPs must identify major

sources of air pollution, determine the reductions from each source necessary to attain NAAQS, establish source-specific and pollutant-specific requirements as necessary for the area, and demonstrate attainment of NAAQS by the applicable deadlines established in the CAA. If a state fails to submit a SIP that attains the NAAQS, the EPA imposes a federal implementation plan for that region.

The Army has broad compliance responsibilities under the CAA. It must comply with all federal, state, interstate, and local requirements; administrative authorities; and processes and sanctions in the same manner and to the same extent as any nongovernmental entity. This compliance requirement includes any reporting, recordkeeping, permitting requirements, and payment of service charges and fees set forth in regulations or statutes. It also includes cooperating with the EPA or state inspections.

JSMC-Lima's future air emissions are subject to two different programs depending on the specifics of the potential change and the pollutants involved. Major sources located in attainment areas must obtain approval to construct new emissions sources "significant" emission increase. For the purposes of CAA compliance, "project" includes operational changes that affect emissions, in addition to equipment construction or modification. The purpose of this Prevention of Significant Deterioration (PSD) program is to prevent areas that currently meet the CAA standards from becoming nonattainment areas. A PSD permit must be obtained in order to:

- Construct a new major stationary source of criteria pollutants, or
- Modify an existing major stationary source such that emissions from the source would increase significantly. (The significance thresholds vary from 0.0004 to 100 tpy depending on the pollutant.)

Under the provisions of the PSD program, a "major source" is defined as having a potential to emit (PTE) of 250 tpy for a criteria (attainment) pollutant or 100 tpy for 28 specific source categories *[40 CFR 51.166(b)(1)(I)].* Of the 28 specific categories, most are not found on military installations except for large fossil fuel boilers (>250 MBtu/hr) which may be found on a few installations. Fugitive emissions must be included in major source determinations for criteria pollutants if they are emitted from one of 28 specific source categories or from a source category regulated on or before August 7, 1980 under CAA section 111 (NSPS) or section 112 (NESHAP). PSD Permitting can also be avoided by taking federally enforceable limits that restrict the emissions from exceeding the significant net increase thresholds. This is possible only when it is acceptable to limit operations. In the case of JSMC-Lima, it may not be possible to limit operations and still accomplish the new mission.

PSD permits can take up to two years to obtain, even if the permittee provides all the analysis. Costs for PSD permits can be over $10,000 plus the cost of

application preparation. Under PSD rules, the project may not be started (cannot break ground, cannot bring new equipment on-site) until the permit is final.

Another important piece of regulation guiding air quality is the General Conformity Rule. Under Section 176(c) of the CAA, the Army is prohibited from engaging in, supporting, providing assistance for, or approving activities (e.g., issuing a license or permit) that are inconsistent with SIP requirements. This is known as the General Conformity Rule. General Conformity requirements apply to all federal actions in nonattainment and maintenance areas. General Conformity must show that the federal action does not negatively impact the SIP to meet and maintain the NAAQS. The rule requires facilities to conform to the SIP's purpose of "eliminating or reducing the severity and number of violations" of NAAQS and achieving "expeditious attainment" of the NAAQS. Such activities must not cause or contribute to a new violation; increase the frequency or severity of an existing violation; or delay timely attainment of any standard, required interim emission reduction, or other milestone. As a result, conformity determinations are required to ensure that state air quality standards would not be exceeded and that any proposed actions would comply fully with the SIP. JSMC-Lima would be required to compare the emission levels of any proposed action(s) to current baseline emissions. Where increases in emission levels exceed thresholds established in the General Conformity Rule, a conformity determination must be prepared. In support of the conformity determination, additional air quality modeling may be required to illustrate the proposed action's impacts on air quality in the region.

Depending on the action and the air quality conformity attainment status of the installation, JSMC-Lima might have to complete a separate conformity analysis in addition to the NEPA analysis. Applicability of the two requirements must be considered separately. Exemption from one requirement does not automatically exempt the action from the other requirement, nor does fulfillment of one requirement constitute fulfillment of the other. Although installations should integrate compliance efforts to save time and resources, the two requirements are very different, necessitating separate analyses and documentation.

4.4.1 Potential Air Quality Consequences of the No Action Alternative

JSMC-Lima has current inventories, equipment and permits in place to maintain its current operational tempo. The installation is updating its current Title V permit which will be valid for five years. The Title V permit, issued by the Ohio EPA, allows JSMC-Lima the rights to emit a certain amount of these pollutants into the airshed. JSMC-Lima must certify their compliance annually in order to maintain the conditions set forth in the permit. Maintaining the current levels of manufacturing operations at JSMC-Lima would have no net effect on air quality.

4.4.2 Potential Air Quality Consequences of the Preferred Alternative: Expansion of manufacturing operations.

Any potential increase in air emissions would have to be assessed by JSMC-Lima. Depending on the significance of the operational change, this analysis may be no more involved than a conformity analysis or may result in a full-blown conformity determination with subsequent changes to the Title V permit and mitigation requirements. Even if the proposed action meets the definition of one of the exemptions or when emissions would not exceed a *de minimis* thresholds, Army policy requires preparation of a "Record of Non-applicability" (RONA) to reflect a proponent's consideration of the Conformity Rule's requirements.

At a minimum, an increase in operations and airshed emissions will require JSMC-Lima to conduct a General Conformity Analysis where thresholds are established. Each criteria pollutant is assessed individually. This analysis is required when a federal facility plans an action that would result in emission of pollutants that have been designated nonattainment or maintenance. The review is only for pollutants or the precursors to the pollutant. In this case, since ozone is the pollutant of concern, JSMC-Lima must account for its potential increases in VOCs and NO_x. The results of this analysis will result in a RONA if the proposed actions are less than the emissions thresholds (*de minimus* values), or the emissions are not regionally significant (i.e., direct and indirect emissions of any pollutant represent less than 10% of an area's emission budget for that pollutant). Direct emissions are those that occur as a direct result of the proposed action, and occur at the same time and place of the action (e.g., emissions from new boilers or generators needed to support the new operation; new surface coating operations). Indirect emissions are those that occur at a later time or distance from the location where the activity takes place or can reasonably be anticipated as a consequence of the proposed action (e.g., emissions from construction equipment or vehicle exhaust; increased commuter traffic for the new activity).

For its "attainment" criteria pollutants, JSMC-Lima must obtain approval to construct new emissions sources or to modify existing emissions sources if the modification project would result in a "significant" emission increase. The PSD permit must be obtained in order to demonstrate that emissions from the source would not have significant impact on the local airshed.

Triggering CAA Title V permits in criteria pollutant attainment areas will require Best Available Control Technology standards. Depending on any regulatory headroom, JSMC-Lima can make better decisions so as to avoid or minimize costs (e.g., process change to reduce emissions or create off-sets, current control technology changes, and/or developing/purchasing emission reduction credits).

Army installations maintain appropriate programs to insure and document compliance with local and state air quality requirements, and these on-going efforts should prove sufficient to react to any proposed change to JSMC-Lima's production schedule/process. In some cases, site-specific analyses, and further

coordination with federal, state and local regulators, may be required. Such regulations include those addressing visible emissions, particulate emissions, and VOC emissions; and applicability will be a site-specific, local determination. Frequent coordination with state and local regulators should minimize expensive mistakes later in the planning process.

4.5 HAZARDOUS MATERIAL AND HAZARDOUS WASTE.

4.5.1 Potential Hazardous Material and Hazardous Waste Consequences of Alternative 1. No Action Alternative

Maintaining the current levels of production at JSMC-Lima would have no net effect on hazardous materials and hazardous waste

4.5.2 Potential Hazardous Material and Hazardous Waste Consequences of the Preferred Alternative: Expansion of manufacturing operations.

The processes associated with fabrication and assembly and manufacturing of new weapons systems platforms, or major assemblies thereof, would be virtually the same as the current processes (see Section 2.5). JSMC-Lima has facilities to properly store hazardous materials. Additional fabrication, assembly and manufacturing may require more frequent delivery of hazardous materials. The increase in frequency would not increase the risk to environmental or human health as the current facilities could accommodate such an increase and the overall risk would remain very low.

The type of waste generated would be similar in nature to that already being generated from current processes. (See Section 2.5 and Figure 2.2). The JSMC-Lima has an established, mature management and education program that effectively manages its waste stream. The Ohio Environmental Protection Agency (Ohio EPA) issued to JSMC-Lima a permit, under the authority of the Resource Conservation and Recovery Act (RCRA), Subtitle C, for generation of hazardous Waste (Ohio EPA, 2004). JSMC-Lima is identified as a Large Quantity Generator, creating greater than 1,000 kilograms/month (2,200 lbs/month) of non-acute hazardous waste. Additional fabrication, assembly, manufacturing, and testing of weapons platforms at JSMC-Lima would likely generate increased volumes of hazardous waste, but it would have no effect on public or environmental health. If additional processes are required for the fabrication or manufacturing process not described in this document, JSMC-Lima would conduct a risk assessment and identify the waste and/or emissions associated with that process.

4.6 FACILITIES AND INFRASTRUCTURE

4.6.1 Potential Facilities and Infrastructure Consequences of the No Action Alternative

Maintaining the current levels of production at JSMC-Lima would have no net effect on facilities and infrastructure.

4.6.2 Potential Facilities and Infrastructure Consequences of the Preferred Alternative: Expansion of manufacturing operations.

The JSMC-Lima has capacity in its existing facilities and infrastructure to meet increased demand for fabrication, assembly and manufacturing operations. As indicated by the information provided in Appendix C, the JSMC-Lima facility has technology and infrastructure to fabricate, assemble, and manufacture weapons platforms for the Department of Defense. The test track was built in 1977-1978 expressly for the purpose of testing the M1 tank. Suitable for the M1, the test track may not meet the requirements for performance testing other vehicles that go through final assembly at JSMC-Lima. Vehicle-specific testing criteria may require addition to, or modifications of, the existing vehicle test track.

4.7 NOISE

Noise is unwanted or unwelcome sound usually caused by human activity and added to the natural acoustic setting of a locale. It is further defined as sound that disrupts normal activities or that diminishes the quality of the environment. Community response to noise is generally not based on a single event, but on a series of events over time. Factors that have been found to affect the subjective assessment of the daily noise environment include the noise levels of individual events, the number of events per day, and the times of the day at which the events occur.

Sound is usually measured using the decibel (dB). The descriptor of a 24-hour noise environment is the day-night average sound level (DNL). DNL is an average measure of sound, taking into account the loudness of a sound-producing event, the number of times the event occurs and the time of day. Night noise is weighted more heavily because it is assumed to be more annoying. The DNL descriptor is accepted by federal agencies as a standard for estimating impact and establishing guidelines for compatible land uses.

The use of average noise levels over a protracted time period generally does not adequately assess the probability of community noise complaints. The metric PK 15(met) accounts for statistical variation in received single event peak noise level that is due to weather. The metric PK is the calculated peak noise level, without frequency weighting expected to be exceeded by 15 percent of all events that

might occur. If there are multiple weapon types fired from one location, or multiple firing locations, the single event level used should be the loudest level that occurs at each receiver location. Installations assess noise from small arms ranges using a single event metric, either PK 15(met) or A-weighted sound exposure level (ASEL). Installations use the land use planning zone (LUPZ) contour to better predict noise impacts when levels of operations at airfields or large caliber weapons ranges are above average. Installations also manage noise-sensitive land uses, such as housing, schools, and medical facilities as being acceptable within the LUPZ and noise zone I, normally not recommended in noise zone II, and not recommended in noise zone III (Table 4.2) (U.S. Army, 2007a).

Table 4.2 Department of the Army Noise Limits for Noise Zones

Noise Zone	Noise limits (dB)		
	Aviation ADNL	Impulsive CDNL	Small Arms PK 15 (met)
LUPZ	60 - 65	57 – 62	N/A
I	< 65	< 62	< 87
II	65 – 75	62 – 70	87 – 104
III	> 75	> 70	> 104

Reference AR 200-1, Table 14-1, page 44, (U.S. Army, 2007a)

Noise from transportation sources, such as vehicles and aircraft, and from continuous sources, such as generators, are assessed using the A-weighted DNL

A noise study was conducted in 1987 to evaluate the noise generated when the M1 operates on the facility's test track. The contour for noise zone II is essentially the perimeter of the test track. During the tank test the L_{10} measurements varied from 51 to 58 dBA near the test track to a range of 51-57 dBA at sites near Reed Road. The nine (9) decibels added to those values for night noise level assessment, equates to 60-67 and 60-66 dBA, respectively during nighttime hours at those locations (Lima Army Tank Plant, 1987).

The night noise levels generated by the M1 tank that were measured near Reed Road are on the low end of the noise zone II (see Table 4.2). Daytime noise-level measurements near Reed Road are within noise zone I (see Table 4.2).

4.7.1 Potential Facilities and Infrastructure Consequences of the No Action Alternative

Maintaining the current levels of production at JSMC-Lima would have no net effect on noise generated from JSMC-Lima.

4.7.2 Potential Facilities and Infrastructure Consequences of the Preferred Alternative: Expansion of manufacturing operations.

The Ohio Bureau of Worker's Compensation conducted a noise dosimetry study in 1995 to assess the JSMC-Lima employee's exposure to noise. That study was supplemented in 1998 in a study commissioned by General Dynamics. Results of both studies indicate that certain jobs may results in noise exposures exceeding the OSHA PEL of 90 dBA and the OSHA "Action level of 85 dBA. JSMC-Lima instituted a hearing conservation program as required by OSHA. Hearing protection is required in many areas of JSMC-Lima. Noise associated with fabrication, assembly and manufacturing operations at JSMC-Lima occur with the buildings at the facility. Occupational hearing protection programs already in force at JSMC-Lima adequately protect workers from noise hazards inside the buildings.

Testing noise levels have been calculated as part of an Installation Compatible Use Zone (ICUZ) plan for the M1 Abrams tank (Lima Army Tank Plant, 1987). The vehicle test track was built with design features to mitigate noise generated from vehicle operations. Additionally, the forested areas serve as a buffer between the test track and residences to the south. Currently only the M1 is operated on the JSMC-Lima test track. If JSMC-Lima were to completely assemble a vehicle, and conduct operational tests within the facility, it would be necessary to conduct noise level studies to determine if objectionable levels of noise would leave the facility.

4.8 TRAFFIC AND TRANSPORTATION

4.8.1 Potential Traffic and Transportation Consequences of the No Action Alternative

Maintaining the current levels of production at JSMC-Lima would have no net effect on traffic or transportation in Lima or Allen County.

4.8.2 Potential Traffic and Transportation Consequences of the Preferred Alternative: Expansion of manufacturing operations.

Additional mission requirements to fabricate, manufacture, assemble and test weapons systems or combat vehicles would likely require additional employees, and thus, additional vehicle trips on the road network near, and leading to, JSMC-Lima. It would also generate increased truck trips deliver supplies and components for manufacturing operations.

Truck traffic to support JSMC-Lima operations would largely be limited to the 2.35-mile route between the facility and I-75 (Figure 3.4). This additional traffic, coupled with some nearby roads with LOS "E" and "F" (Figure B.6, Appendix B)

and roads with deficient lane width (Figure 3.4) could contribute to a deterioration of LOS of roads in the area around JSMC-Lima.

4.9 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

4.9.1 Potential Socioeconomic and Environmental Justice Consequences of the No Action Alternative

Maintaining the current levels of production at JSMC-Lima would have no net effect on Socioeconomics in Lima or Allen County.

4.9.2 Potential Socioeconomics and Environmental Justice Consequences of the Preferred Alternative: Expansion of manufacturing operations.

The addition of another mission to fabricate, manufacture and assemble a weapon system platform or combat vehicle may require hiring additional personnel. Hiring additional personnel would not only add to the employment in Allen County, but also increase the number of people employed in the manufacturing sector. Hiring additional personnel to support additional mission at JSMC-Lima would have a minor positive effect on the economy in the Lima and Allen County area.

Census Tract 119 is the census tract closest to JSMC-Lima (See Figure B.4, Appendix B). Population demographics obtained from the US Census Bureau (US Census Bureau, 2008) shows the population is largely Caucasian (93.8%), and well educated, with 89.9% high school graduates or higher. The median household income in this census tract is $46,723 with 2.4% of residents in this census track living below the poverty level. See Section 3.13 and Table 3.3. The proposed action would not disproportionately affect a population due to their race, national origin, income or education levels. Therefore it has been determined that no environmental justice communities are present in the population living near the JSMC-Lima facility.

4.10 CUMULATIVE EFFECTS

4.10.1 Introduction

Cumulative impact is the “cumulative effect on the environment which results from the incremental impact of the action” which when added to “other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions (USAEC, p. 6).

A particular action may cause only minor adverse (or beneficial) effects on the environment. However, when added to the effects of other activities, the overall (cumulative) effect may be significant. In some cases, the effects of a project, when combined with those of other activities, cause synergistic effects, which are different than those of the projects individually and could be significant. Additive and synergistic effects are identified by a cumulative analysis.

The description of the affected environment should include an environmental baseline. A baseline is the condition of a resource, ecosystem, or community without the effects of the activities considered in the cumulative analysis. The cumulative analysis will measure effects, quantitatively or qualitatively, relative to this baseline.

The spatial area for the cumulative effects analysis will be Allen County. The temporal timeframe for this analysis is the general timeframe of 5-7 years from the date of this document.

4.10.2 Potential future actions.

The Lima-Allen County Planning Commission has identified several tracts of land as available for industrial uses, industrial park, Enterprise Park or Foreign Trade Zones (Figure B.8, Appendix B).

The Lima-Allen County Regional Planning Commission has identified two capitol projects for roadways near JSMC-Lima scheduled for the 2008-2011 timeframe. One is to study and make recommendations for improvements to a portion of Shawnee Road, (north-south road west of JSMC-Lima), and the other for ramp structure improvements for the Fort Shawnee interchange (Breese Road) with I-75.

4.10.3 Potential Cumulative Effects

Additional expansion of the manufacturing business sector in the area (Figure B.8, Appendix B) could contribute, along with increased employment at JSMC-Lima, to increased vehicle traffic on roads near JSMC-Lima. Most of the roads near, or leading to, JSMC-Lima have a LOS of “C” or better. Planned roadway improvements identified by The Lima-Allen County Regional Planning Commission (undated) could have a positive affect on LOS on roads near JSMC-Lima.

Future expansion of businesses and employment in the area would contribute to increased traffic volume, and potentially cause a reduction in the level of service on roads in the area near JSMC-Lima. At such point, the Lima Allen County

Planning Commission may need to re-evaluate its Transportation Improvement Plan and for roadways in the area.

Increased vehicle traffic, along with expanded industrial operations could also increase air emissions. These emissions must be accounted for in the form of operating permit headroom, identifying methods to off-set planned increases, or acquiring emissions reductions credits as a means for dealing with the planned emissions. The CAA ensures there is no “back-sliding” in an air quality management region. As such, JSMC-Lima must be able to demonstrate that its emissions changes would not have an affect on regional air quality (conform with the respective SIP).

Expansion of businesses/industries in the industrially-zoned area near JSMC-Lima would have a positive cumulative effect on the socioeconomic conditions in Lima and Allen County.

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SECTION 5.0: CONCLUSIONS

The addition of fabrication, manufacturing, assembly and test operations to build weapons systems platforms for DoD would have little effect on the quality of the human or natural environment on JSMC-Lima facility or surrounding environs.

It is anticipated that additional manufacturing operations at JSMC-Lima would have no affect on the following valued environmental components:

- Airspace
- Cultural and Historical Resources
- Threatened and Endangered Species
- Natural Resources
- Soil and Soil Erosion
- Land Use
- Energy
- Water Resources
- Wetlands

Expanding manufacturing operations at JSMC-Lima may require a more detailed study of potential air emissions and whether potential emissions are within the existing limits of the facility's Title V Air Quality permit.

Increased employment to meet increased manufacturing operations could lead to increase traffic volume on roads near, and leading to, JSMC-Lima. Increased manufacturing operations would also cause an increase in truck traffic. The total increase in traffic volume could affect LOS, though only two roads near JSMC-Lima have LOS below "C." Increased manufacturing operations would likely cause the generation of increased solid and hazardous waste. The JSMC-Lima is licensed by the Ohio Environmental Protection Agency (Ohio EPA) as a large-quantity generator of hazardous waste. JSMC-Lima has sound, well-established policies and procedures to effectively manage its solid and hazardous waste. Increased manufacturing operations at JSMC-Lima could involve fabricating a major component to be assembled elsewhere, or final production which may require use of the JSMC-Lima test track. This condition may require a noise level analysis of vehicle(s) operated on the test track, as well as an analysis of the capability of the test track to conduct needed operational tests. If noise from vehicle testing exceeds that from the M1 Abrams tank JSMC-Lima may need to identify and implement mitigation measures to avoid objectionable levels of noise reaching local residents. In addition, the manufacturing operations due to an increase in employment would have a positive effect on the local economy.

JSMC-Lima is considered a major source of air pollutants and is required to operate under the provisions of a Title V permit. As such, any new sources of air emissions or extensive modification of JSMC-Lima's existing processes would require an analysis of the affects the change would have on the county's air

quality. The level of detail and associated costs would be proportional to the proposed changes but the installation must be able to demonstrate to local or federal regulators that the proposed process change would have no significant impact on air quality. The requirements of the Clean Air Act require the regulated community to keep detailed records of their actions, often an expensive and lengthy process, in order to properly defend there decisions.

Cumulative affects of increased manufacturing operations at JSMC-Lima, coupled with increased operations on industrially-zoned properties near JSMC-Lima could contribute to increased traffic and a reduced LOS on roads near JSMC-Lima. The Lima-Allen County Regional Planning Commission has identified two projects to improve roadways in the area and if constructed may mitigate some of the affects of increased traffic volumes. Increased industrial operations in the area could, along with JSMC-Lima affect the air quality of the region. Increased traffic volume, and potential emissions could affect air quality compliance in the Lima-Allen County area. Additional industry located near JSMC-Lima would have a positive effect on the area's economy.

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SECTION 8.0: ACRONYMS AND ABBREVIATIONS

A.C.	Alternating Current
CAA	Clean Air Act
CAAA-90	Clean Air Act Amendments of 1990
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DoD	Department of Defense
HAP	hazardous air pollutants
HQ	Headquarters
ICUZ	Installation Compatible Use Zone
JSMC-Lima	Joint Systems Manufacturing Center- Lima
KW	Kilo Watt
LOS	Level of Service
LUPZ	land use planning zone
MACT	Maximum Achievable Control Technology
Mappolene	Flammable gas, a mixture of 96% propylene and 4% propane propylene used in welding (BOC Group, 2008).
Maskant	Similar in concept to how masking tape is used to prevent paint from being applied to an adjoining surface. In metal fabrication processes, maskants are applied to a surface to prevent treatment process from being applied to specific portions of the metal's surface. Maskants used in metals processing are made from a variety of materials, to include metallic powders, or liquids that dry on the metal product.
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act

NESHAPs	National Emissions Standards for Hazardous Air Pollutants
Paratransit	Aalternative mode of flexible passenger transportation that does not follow fixed routes or schedules. Typically vans or mini-buses are used to provide paratransit service. At their simplest they may consist of a taxi or small bus that will run along a more or less defined route and then stop to pick up or discharge passengers on request. At the other end of the spectrum, the most flexible paratransit systems offer on-demand call-up door-to-door service from any origin to any destination in a service area.
PEA	Programmatic Environmental Assessment
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
REC	Record of Environmental Consideration
RONA	Record of Non Applicability
SIP	State Implementation Plan
tpy	tons per year
USMC	United States Marine Corps
µm	micro-meter; equals $1x10^{-6}$ meter
VOC	Volatile Organic Chemicals

SECTION 9: REFERENCES

Allen Economic Development Group, (2008). Allen County Economic Development Group, Available on the Internet at: http://www.aedg.org/index.php, accessed February 1, 2008.

American Association of State Highway Transportation Officials, 2001. A Policy on Geometric Design of Highways and Streets. American Association of State Highway and Transportation Officials, 4th edition, Washington, DC.

BOC Group, (2008). Material Safety Data Sheet for Mappolene. http://www.mri.psu.edu/facilities/NNIN/media/M/Mappolene.pdf Accessed February 13, 2008.

Building Technology, Inc., (1984). Historic Properties Report, Lima Army Tank Plant, Lima, Ohio. Building Technology, Inc, Silver Spring, MD.

Census Bureau, (2008). http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=16000US3927944&-qr_name=DEC_2000_SF1_U_DP1&-ds_name=D&-_lang=en&-redoLog=false, Accessed February 19, 2008.

City of Lima, (2005). Wastewater Treatment Plant, Industrial Discharge Permit Number JSM*001, Issued May 24, 2005.

City of Lima, (2008a). Water Treatment Plant Flow & Treatment. http://www.cityhall.lima.oh.us/dept/utilities/wtreatment.asp, accessed February 20, 2008.

City of Lima, (2008b). Wastewater Treatment. http://www.cityhall.lima.oh.us/dept/utilities/wwtreatment.asp, Accessed February 20, 2008.

Clayton Group Services, Inc. (2004). Environmental Impact Assessment, The Modification and Expansion of the Lima Army Tank Plant Production Capability. Clayton Group Services, Inc., Novi, MI.

Colasanti, Chris, (2008). Assistant Supervisor of the City of Lima Water Treatment Facility, Lima, Ohio. Personal Conversation with Jeff Springer, February 21, 2008.

Executive Office of The President, (1994). Executive Order 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations. February, 11, 1994. Federal Register, Vol. 59, No. 32 Wednesday, February 16, 1994.

Ford, Chevy, (2008). Personal Conversation about airspace at Lima Airport, Lima and Joint Systems Manufacturing Center- Lima, March 7, 2008.

Furguson Company. (1976). Environmental Impact Assessment Report for the Modernization and Expansion of Lima Army Modification Center's Production Capability.

General Dynamics Land Systems, (2004). Joint Systems Manufacturing Center, Environmental Health and Safety Management System, Reference Materials.

General Dynamics, Land Systems, (2005) Detailed Facility Description of Lima Army Tank Plant.

General Dynamics Land Systems (2007). Joint Systems Manufacturing Center, Environmental Resources Management, "The Green Book." Joint Systems Manufacturing Center-Lima, Lima, Ohio. November 2007.

Goldstein, Louis, and Peter Spear, (1980). Supplemental Environmental Assessment for the Modification and Expansion of Production Capability at the Lima Army Tank Center, Lima, Ohio. Prepared by Louis Goldstein, H.K. Ferguson Company and Peter W. Spear, Natural Resources Consulting Services. October 10, 1980.

Kitchen, Judith, (1991). Memorandum from Judith Kitchen, Ohio Historical Society to Lieutenant Colonel Raymond Pawlecki, Commander, Lima Army Tank Plant.

Johnny Appleseed Metropolitan Parks District, 2008. http://www.jampd.com/home/parks.php?rid=6, accessed February 4, 2008.

Lane, Mark, (2007). Chief, Environmental Office, JSMC-Lima. Personal Conversation with Jeff Springer, December 12, 2008.

Leimeister, Wade, (2008). Shift Supervisor, Wastewater Treatment Plant, City of Lima. Personal Conversation with Jeff Springer on February 25, 2008.

Lima-Allen County Regional Planning Commission, (2005). 2030 Long Range Transportation Plan, Prepared by the Lima-Allen County Regional Planning Commission, Lima OH. Available on the Internet at http://www.lacrpc.com/documents/2030LRP--COMPLETE_001.pdf, Accessed February 8, 2008.

Lima-Allen County Regional Planning Commission, (undated). Transportation Improvement Plan, 2008-2011. Prepared by the Lima-Allen County Regional Planning Commission, Lima OH. Available on the Internet at http://www.lacrpc.com/documents/FY2008-2011TIP--COMPLETE_005.pdf, Accessed February 8, 2008.

Lima-Allen County Regional Planning Commission, (2007). Comprehensive Economic Development Strategy for Allen County, Ohio 2007. Lima-Allen County Regional Planning Commission, Lima, OH.

Lima Army Tank Plant, (1987). Draft Installation Compatible Use Zone Analysis (ICUZ). U.S. Army Lima Army Tank Plant, Lima, Ohio.

Lishvar, Robert and Steve Sprecher, (1997). Wetlands Delineation, Lima Tank Plant, Lima, Ohio. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS June 27, 1997.

Mathew, Jeff, (2008). Superintendant, Shawnee #2 Wastewater Treatment Plant, Allen County, Ohio. Personal Conversation with Jeff Springeron February 25, 2008.

Mazer, Tom, (2008). Personal discussion with Tom Mazur, Lima-Allen County Regional Planning Commission. Lima, OH. February 13, 2008.

Ohio Department of Development, (2008). Ohio County Profiles: Allen County. Available on the Internet at: http://www.odod.state.oh.us/research/FILES/S0/Allen.pdf, accessed Feb 1, 2008.

Ohio Department of Natural Resources, (2001). Memorandum from Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Columbus, Ohio. May 8, 2001.

Ohio Department of Transportation, 2008. Ohio Rail Development Commission. http://www.dot.state.oh.us/ohiorail/, Accessed February 11, 2008.

Ohio Environmental Protection Agency, 2002. Title V, Chapter 3745-77 permit, Issued by the Ohio Environmental Protection Agency, Columbus, Ohio. October 16, 2002.

Ohio Environmental Protection Agency, (2003). Authorization to Discharge Under the National Pollutant Discharge Elimination System. Permit number OH0111198, issued January 24, 3003.

Ohio Environmental Protection Agency, (2004). RCRA Subtitle C Site Identification Issued by the Ohio Environmental Protection Agency, Columbus, OH. December 10, 2004.

Ohio State Historical Preservation Office, (1991). Memorandum to JSMC-Lima, subject Cultural Resources Management Plan, Lima Army Tank Plant, Lima, Ohio, March 8, 1991.

Ottawa River Coalition, 2008. Flood insurance map provided by Ottawa River Coalition, 3900 Campus Dr. Lima, OH.

Title 32, Code of Federal Regulations (CFR), Part 651, *Environmental Effects of Army Actions*. Federal Register 15290, March 29, 2002.

Title 40, CFR Parts 1500-1508, Regulations for Implementing NEPA

Transportation Research Board, (2000). *Highway Capacity Manual.* Transportation Research Board, of the National Academies, Washington, DC.

US Army, (2003). Army Regulation 55-80, Department of Defense Transportation Engineering Program, Headquarters, Department of the Army, Washington, DC, November 17, 2003.

US Army, (2004). Permanent Orders 166-7, Issued by Headquarters, US Army Materiel Command, Subject: U.S. Army Lima Tank Plant X7 (W4TGAA, Lima, Ohio 45804. July 9, 2004.

US Army Environmental Command (2007). "NEPA Analysis Guidance Manual," US Army Environmental Command, Aberdeen Proving Grounds, MD. May 2007.

U.S. Army. (2007a). Army Regulation 200-1, Environmental Protection and Enhancement. Headquarters, Department of the Army, Washington, DC. August 28, 2007.

US Department of Energy (1998). Glossary of Terms used in DOE NEPA Documents. Washington, DC: U.S. Department of Energy, Environment, Safety and Health Office of NEPA Policy and Assistance. http://www.eh.doe.gov/nepa/tools/guidance/glossary.pdf

US Environmental Protection Agency (USEPA), 2008. http://www.epa.gov/oar/oaqps/greenbk/index.html, Accessed February 7, 2008.

University of Cambridge, (2008). Friction Stir Welding. Available on the Internet at http://www.msm.cam.ac.uk/phase-trans/2003/FSW/aaa.html, Accessed February 13, 2008.

Whiteman, Rodney L., (2006). Forest Inventory, Analysis and Management Plan for Joint Systems Manufacturing Center – Lima.

APPENDIX A - Record of Environmental Consideration (REC) Checklist and Preliminary Evaluation

This checklist is intended to provide a framework for the identification of any NEPA requirements beyond this PEA for conducting expanded fabrication, manufacture, assembly and vehicle testing conducted at JSMC-Lima, and to certify that both the installation staff and proponent understand and support the requirements and discussions in this PEA, particularly the site conditions, the proposed action, and any required mitigations. If the conditions of the checklist in this Appendix are met, and if the procedures and mitigations are adopted a Record of Environmental Consideration (REC) may be prepared, referencing this PEA, and the proposed fabrication, manufacturing, assembly and vehicle testing can using the ASV can proceed. If some checklist conditions are not met, the JSMC-Lima does not adopt the provisions of this PEA, or the installation environmental office finds this PEA inadequate, a separate EA will be required, and will culminate in either a separate Finding of No Significant Impact (FNSI) or a Notice of Intent (NOI) to prepare an EIS if significant affects are identified. There may be actions at JSMC-Lima, to include changes or expansions at the facility, that independently qualify for use of an existing Categorical Exclusion under provisions of Title 32 CFR Part 651.

The considerations in this PEA, and the REC checklist are comprehensive, but may not be sufficiently exhaustive to address site-specific conditions for every potential manufacturing mission. For this reason, the installation's environmental staff must review this PEA, evaluate the checklist conditions and requirements, and determine the appropriate course of action. If an EA is required it can supplement this PEA, addressing only those topics or issues that require further evaluation.

To use the attached checklist to evaluate the proposed action, the following format is recommended:

- "Yes" implies an issue may require further NEPA analysis.
- "No" on the REC checklist implies applicability of this PEA
- "N/A" implies the question does not apply

The "Response Documentation" column may be used for any comments pertaining to the Proposed Action, or identify existing programs or best management practices, regulations or policies that mitigate an issue identified in the questionnaire.

Any questions regarding completion of this checklist should be directed to the installation environmental staff. This checklist references portions of Title 32, CFR Part 651, "Environmental Analysis of Army Actions."

MEMORANDUM FOR RECORD DATE:

SUBJECT: Evaluation, under the National Environmental Policy Act (NEPA) of expanding the fabrication, manufacturing, assembly and testing of (weapon system/vehicle) at Joint Systems Manufacturing Center – Lima

1. Brief description: (Identify the nature and scope of the fabrication, assembly, manufacturing and testing that is proposed or referring to document(s) already prepared as enclosures).

2. It has been determined that fabricating, manufacturing, assembly and testing of (weapon system/vehicle) at JSMC-Lima (choose a. b. or c.):

   a. Is adequately addressed in an existing: EA____ EIS____

      Title and date:

   b. Qualifies for Categorical Exclusion under provisions of 32 CFR Part 651, Appendix B, Paragraph _____.

   c. Qualifies for a Record of Environmental Consideration, based on the evaluation of the criteria in the checklist below because the issues requiring consideration under the National Environmental Policy Act are addressed in the Programmatic Environmental Assessment entitled, “Programmatic Environmental Assessment for the Fabrication, Assembly, and Manufacturing of Weapon Systems Platforms for the Department of Defense,” dated May 2008.

      The following signatories certify their understanding of the Programmatic Environmental Assessment and the analyses therein, and certify compliance with the provisions and mitigations that are presented. This includes compliance of the procedures (Best Management Practices and Standing Operating Procedures) that are specified, and the funding necessary to insure that the required mitigations will be implemented.

_____	_____
Proponent signature	Environmental Officer signature
_____	_____
Proponent, printed name	Environmental Officer, printed name

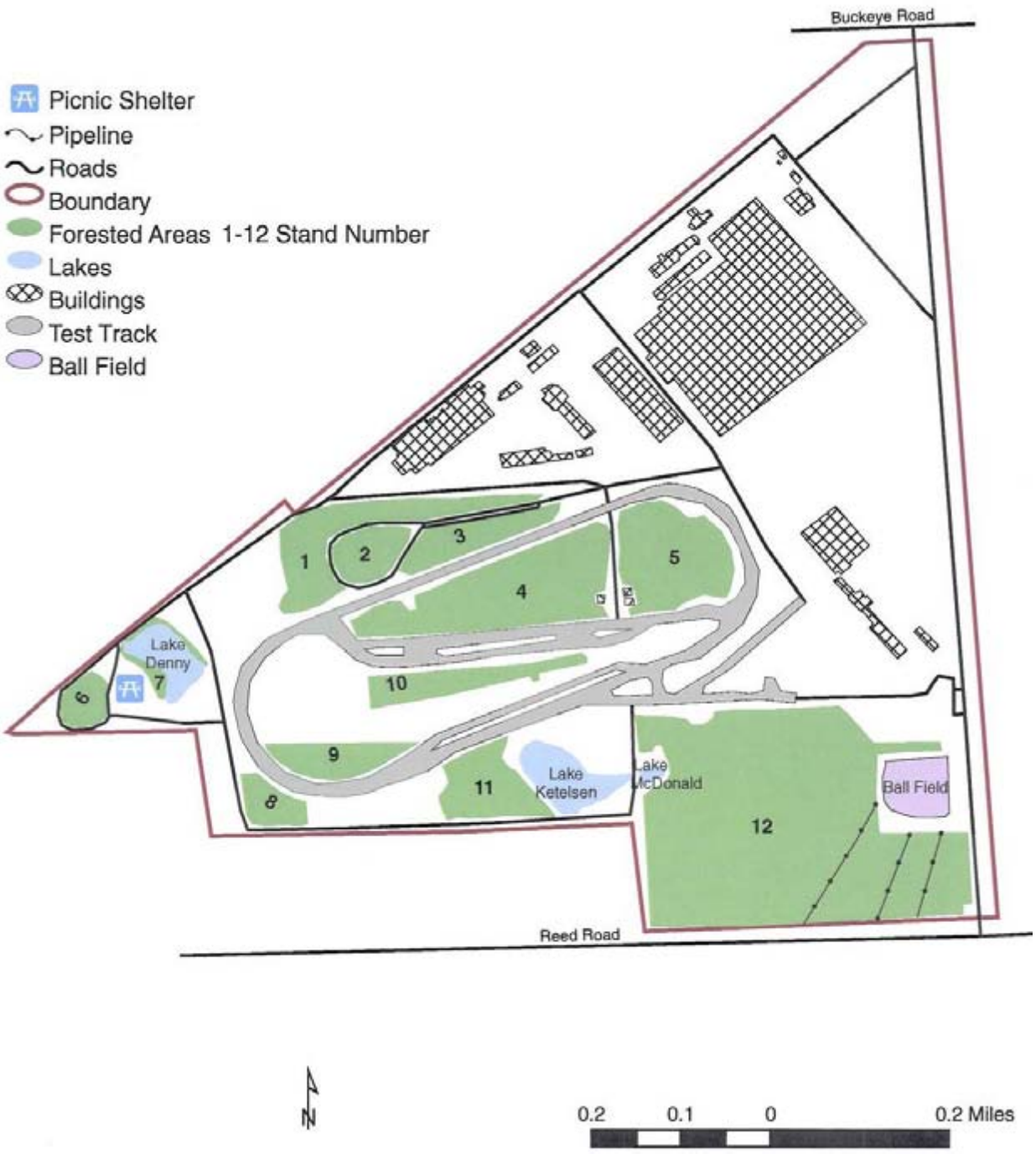
	CATEGORY	Yes,No,N/A	RESPONSE DOCUMENTATION (as needed)
	Manufacturing Processes		
1	Will the proposed action involve a fabrication, manufacturing or assembly process not described in this PEA?		If Yes, describe the process(es) and potential waste stream(s) or emissions. If No, continue to question #2.
	Air Quality		
2	The proposed action would result in a significant increase in air emissions (i.e., exceed the *de minimis* threshold for the pollutant(s) of concern.		If Yes, further analysis, and coordination with air quality permitting authority may be required. If No, continue to question #3.
	Hazardous Materials & Hazardous Waste		
3	The proposed action involves a process or material that has the potential to increase the generation of hazardous waste.		If Yes, ensure storage and disposal complies with provisions of Resource Conservation and Recovery Act (RCRA) regulations. If No, continue to question #4.
4	The proposed action requires the use of hazardous material(s) not currently used at JSMC-Lima.		If Yes, ensure staff receives appropriate training and MSDS made available. If No, continue to question #5.
	Noise		
5	The proposed action involves operating a vehicle on the JSMC-Lima test track		if Yes, continue to question #6. If No, continue to question #7.

	CATEGORY	Yes,No,N/A	RESPONSE DOCUMENTATION (as needed)
	Noise		
6	Noise from the vehicle to be used in the proposed action (stationary and mobile) is greater than that of the M1 Abrams Tank.		If Yes, Identify noise contours from operating on the test track. Will an objectionable level of noise leave the JSMC-Lima boundary? If No, continue to question # 7.
7	The proposed action would require night operations after 8pm for manufacturing operations that cause objectionable levels of light or noise		If Yes, Consider the level of impact on the local community, under the Quiet Communities Act If No, continue to question #8.
	Facilities		
8	The proposed action would result in total employment (contractor and government) exceeding capacity of the current parking lot.		If Yes, identify potential mitigation actions. If ground disturbance greater than 5 acres required, a separate EA may be required. If No, continue to question #9.
9	The proposed action involves requires modification or expansion of the JSMC-Lima vehicle test track.		If Yes, identify specific changes. Modification or expansion of the vehicle test track may be eligible for a categorical exclusion if it involves disturbing less than 5 acres sf. Disturbing forests or identified wetlands near the test track may require further, detailed environmental analysis. If No, continue to question #10.
	Energy		
10	The proposed action would require an increase in the hours of operation of the facility's coal-fired boilers.		If Yes, see question #5. If No, continue to question #11.

	CATEGORY	Yes,No,N/A	RESPONSE DOCUMENTATION (as needed)
	Energy		
11	The JSMC-Lima has sufficient storage capacity for coal to meet increased demand to operate the boilers due to the proposed action.		If No, identify mitigation measures. If Yes, having completed this checklist, complete the memorandum for record.

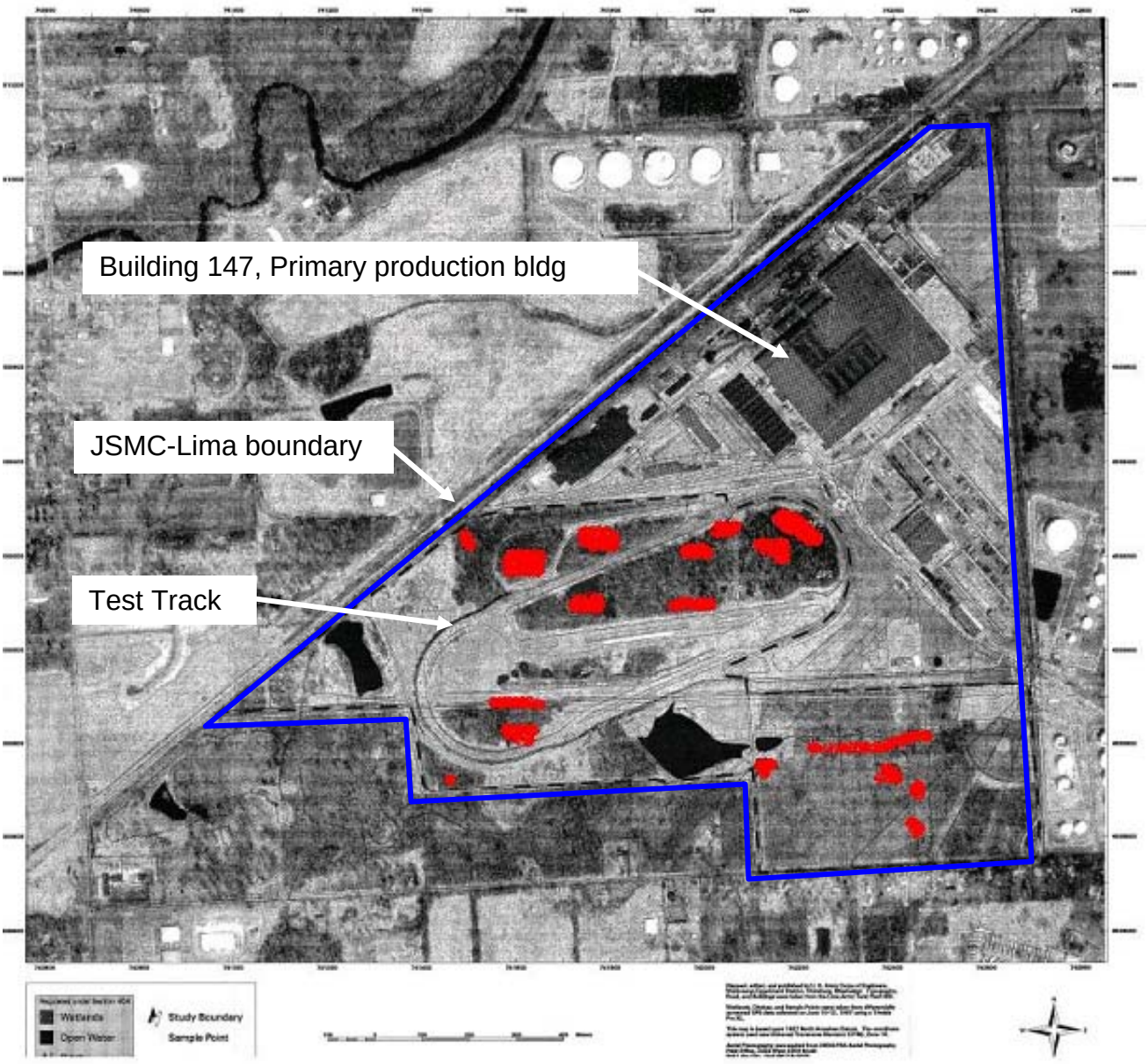
APPENDIX B - Maps

Figure B.1. Forested Areas on JSMC-Lima



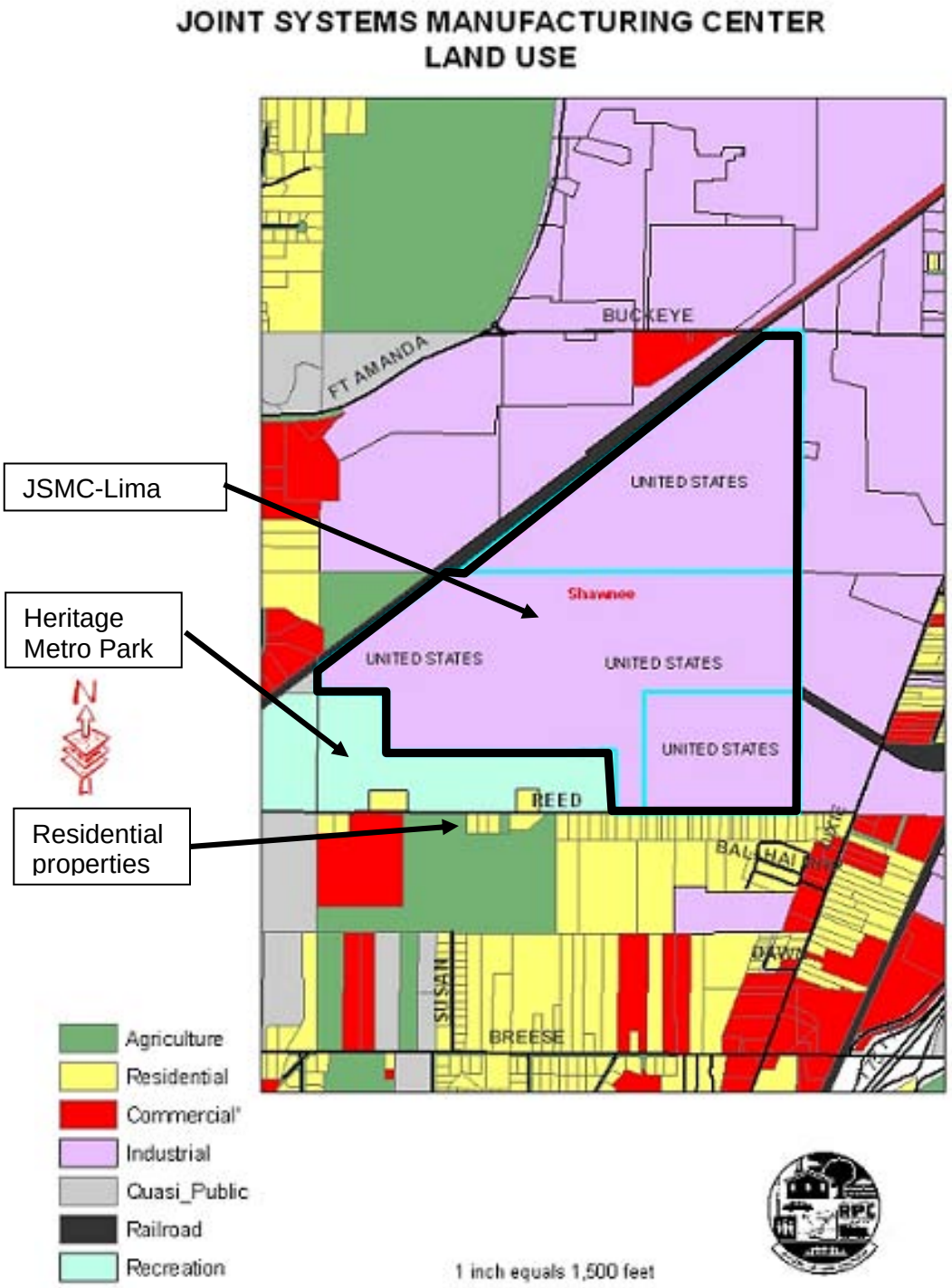
Source: Whiteman, (2006), Figure 2, Page 9.

Figure B.2, Wetlands Delineation Map



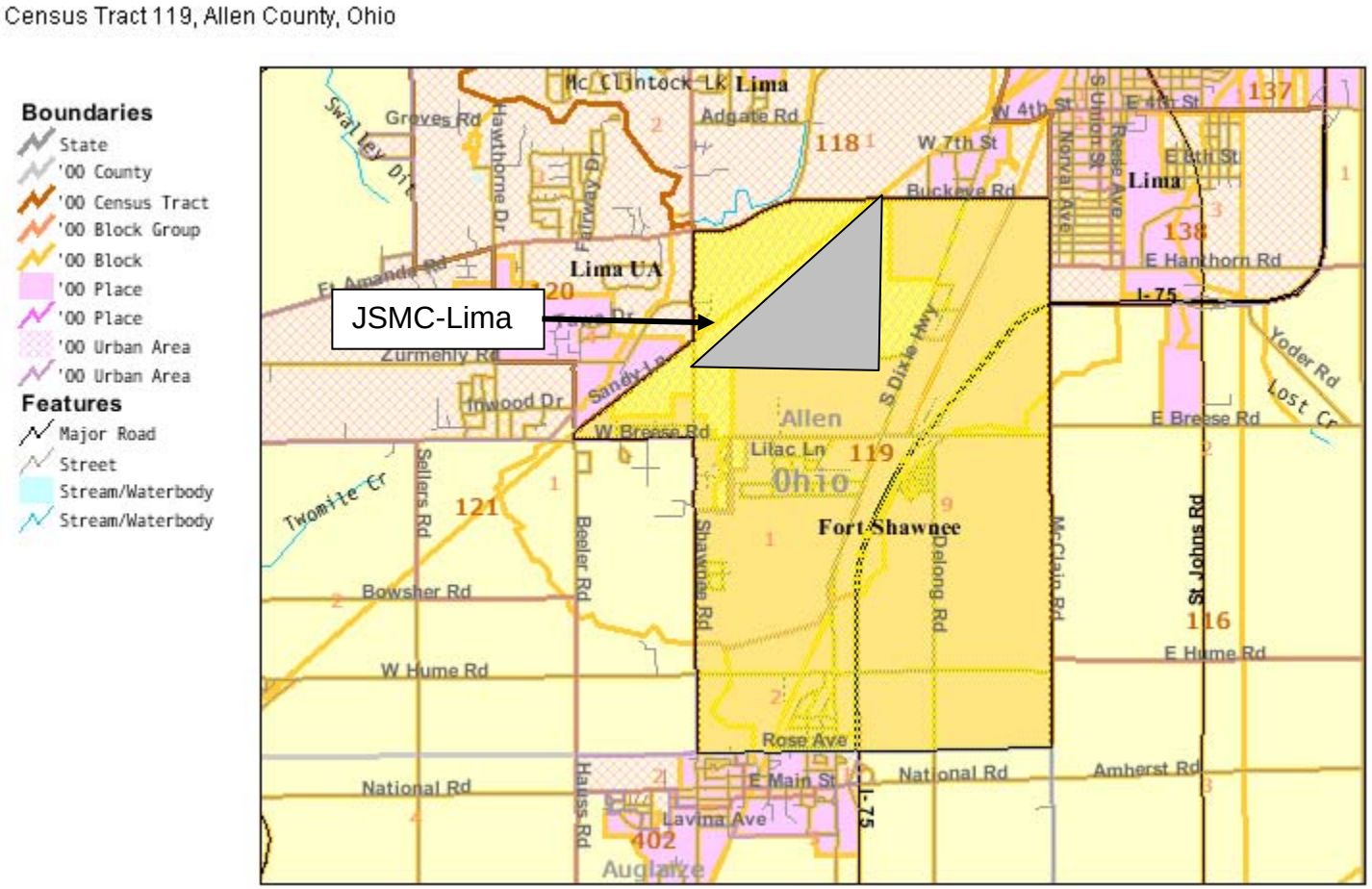
Source: Lishvar, and Sprecher, 1997.

Figure B.3, Land Use Distribution near JSMC-Lima



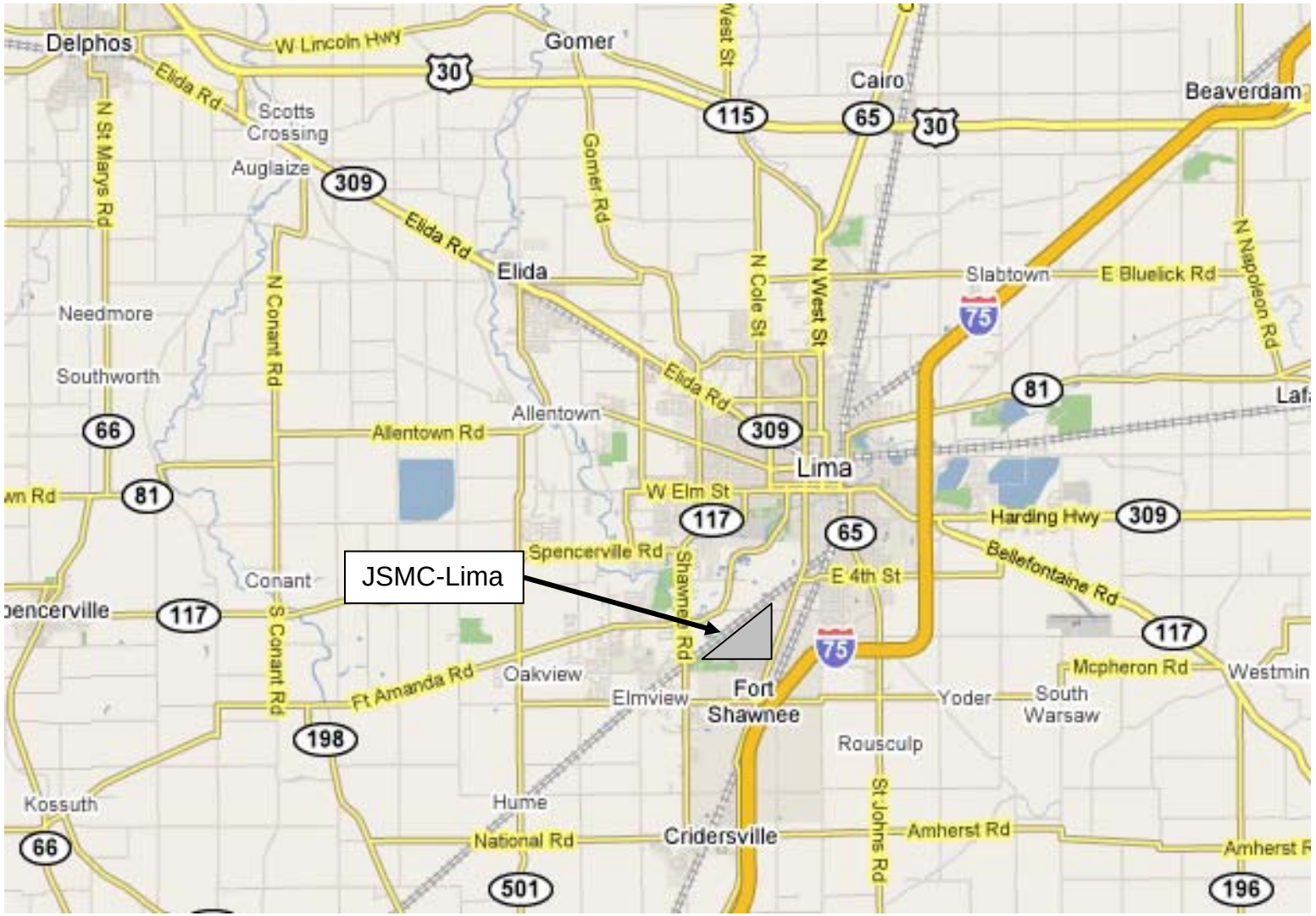
Source: Lima Allen County Regional Planning Commission

Figure B.4. Census Tract 119, Allen County, Ohio.



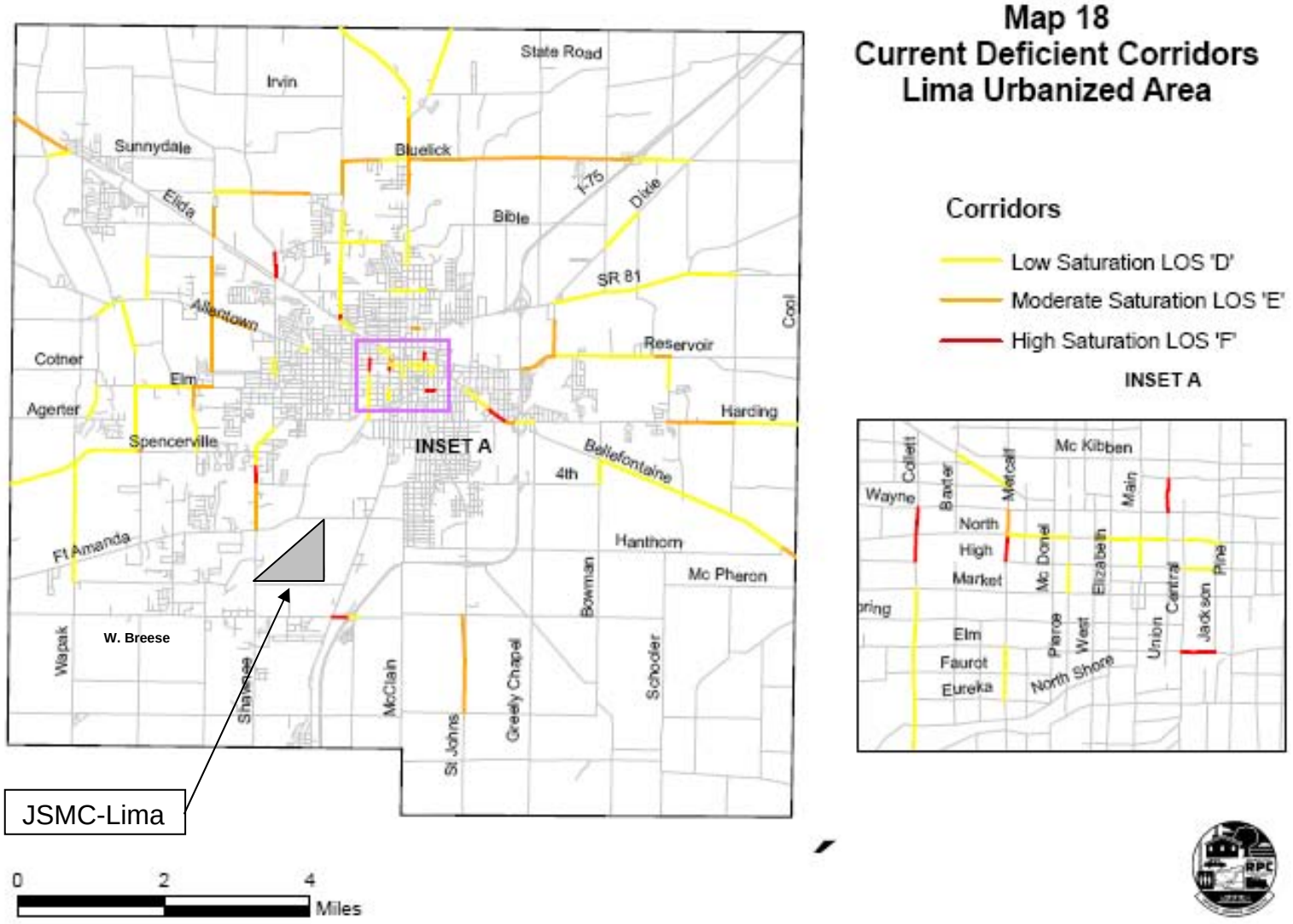
Source: http://factfinder.census.gov

Figure B.5, Road network near JSMC-Lima



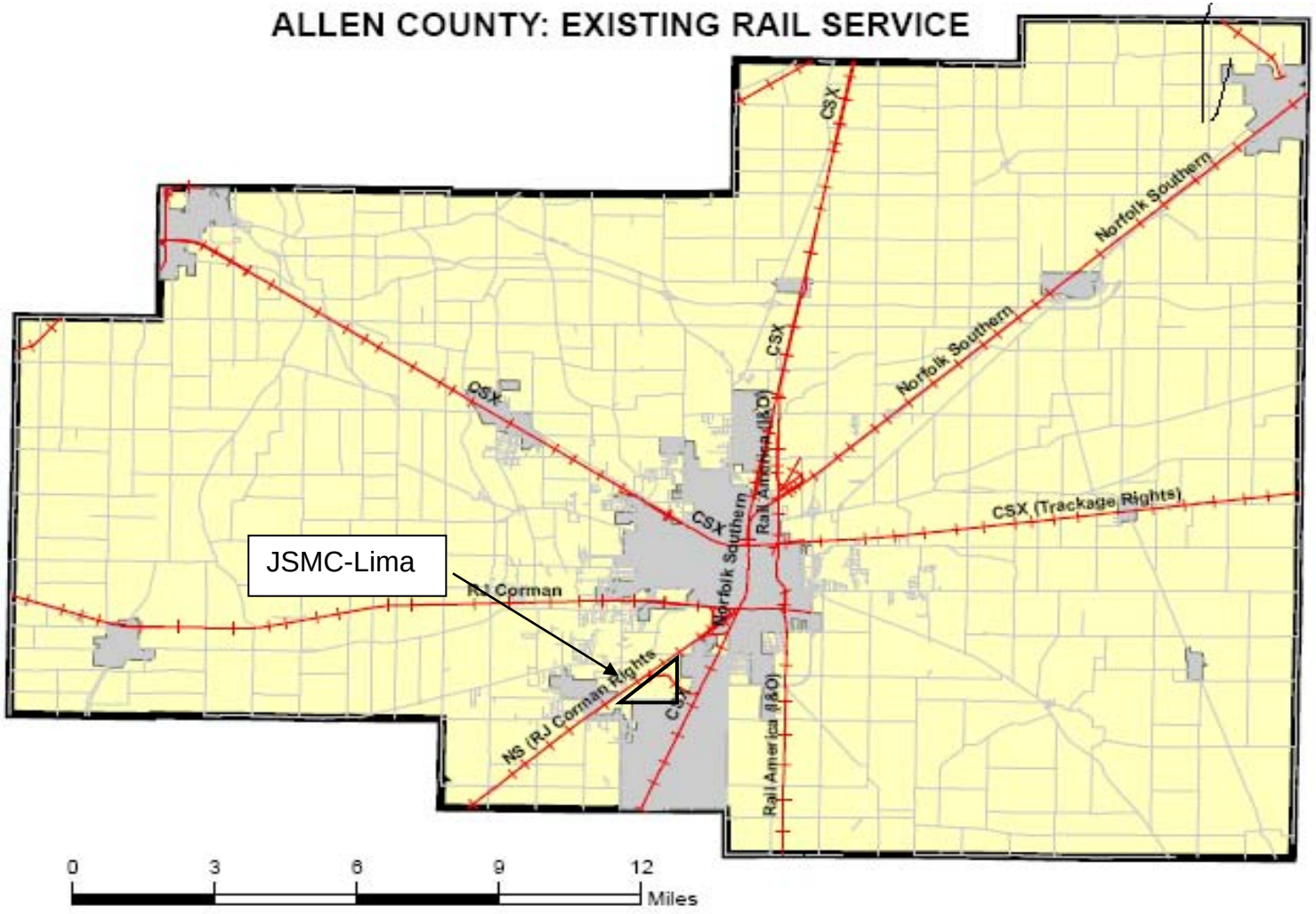
Source: http://maps.google.com, Accessed February 19, 2008

Figure B.6. Level of Service on Roadways in and around Lima, Ohio.



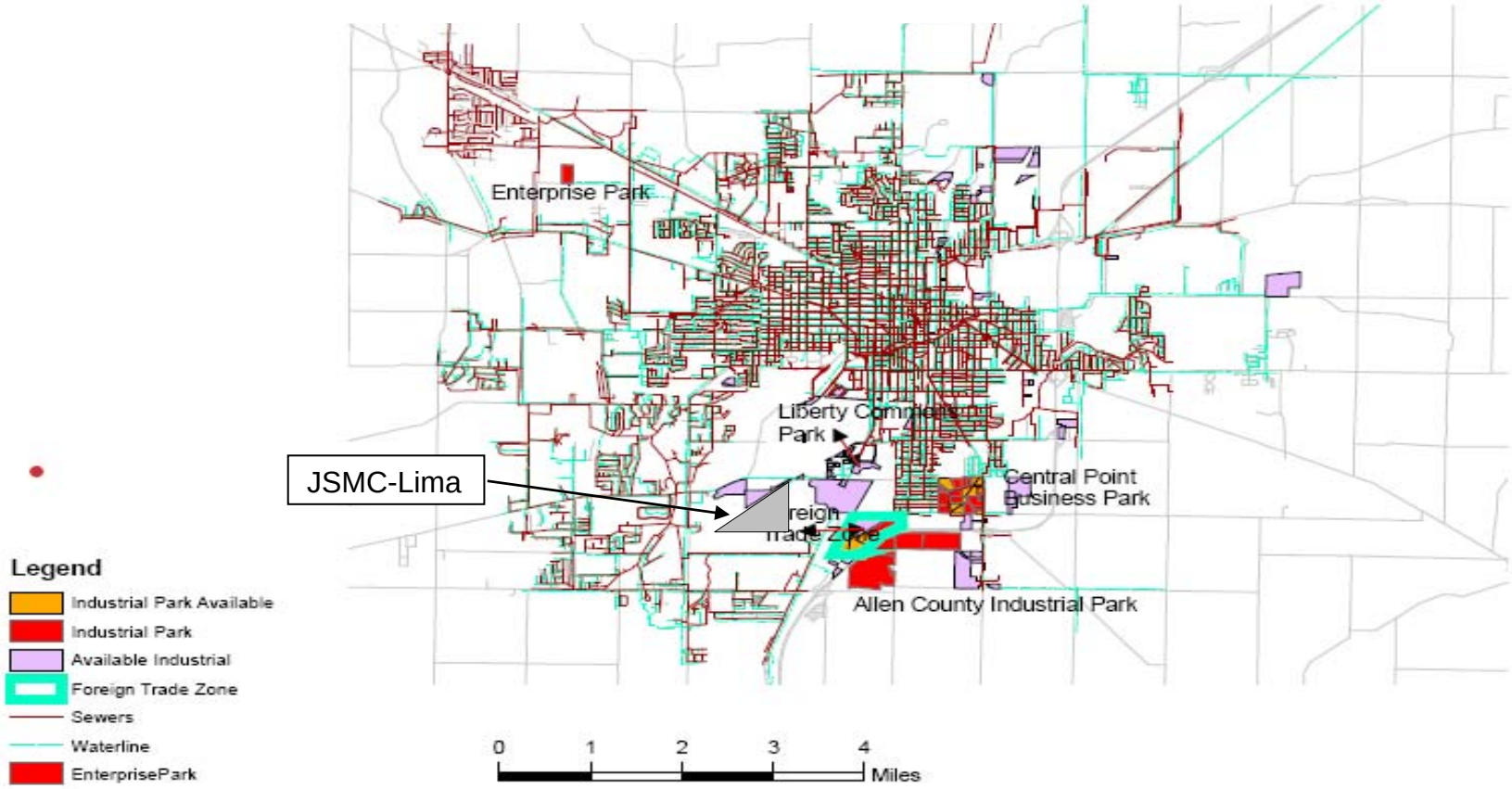
Source: Lima-Allen County Regional Planning Commission, 2005, page 79.

Figure B.7, Rail Service in Allen County, Ohio



Source: Lima-Allen County Regional Planning Commission, (2007), Map 13, page 49.

Figure B.8. Allen County, Industrial Property by Availability and Readiness.



Source: Lima-Allen County Regional Planning Commission, (2007), Map 12, page 47.

Appendix C - Lima Army Tank Plant, Detailed Facility Description

JOINT SYSTEMS MANUFACTURING CENTER- Lima

Detailed Facility Description

C O N T E N T S

1.0 Basic Manufacturing Building Description.

The primary manufacturing area bays as proposed are primarily clear spans of 80 ft. by 40 ft. and 100 ft. by 40 ft. Other areas that are available to support this activity are comprised of bays with clear spans of 40 ft. by 40 ft.

The primary manufacturing areas proposed for this activity have clearances from the bottom of the roof trusses to the floor ranging from 45 ft. to 50 ft. Other areas that are available to support this activity have clearances from the bottom of roof trusses to the floor of 20 ft.

2.0 Building Construction.

The buildings that are proposed for use in performing this activity are all of insulated steel siding and masonry construction, some with concrete block sill wall. The buildings all feature floors of minimum 8 inch thick poured concrete, reinforced and non-reinforced.

3.0 Building HVAC (Heating, Ventilation, Air Conditioning) Systems.

The heating and ventilation systems in the buildings that are proposed for use in performing this activity have all been designed in accordance with ASHRAE standards for both employee comfort and safety. For winter heating season space heating, the buildings are heated by steam systems that are designed for Δt of $+4^0F$ to $+68^0F$. Buildings are equipped with unit heaters, make up air units, heat recovery type exhaust/make up units and conventional supply and exhaust fans. Air exchange rate for the areas proposed for use in performing this activity range from a minimum of 1.0 cfm per sq. ft. to 2.7 cfm per sq. ft. The heat recovery units which serve areas proposed to support this activity recover approximately 60% of the heat from the exhausted airflow and return it to the buildings. These units are the primary air exchange devices and contribute to the overall average exchange rate of approximately 2.0 cfm per sq. ft. of floor space.

For summer cooling requirements manufacturing areas are ventilated using the air moving devices described above following shutdown of the steam heating supply. Large office areas are all cooled by central chillers using pneumatic and electric multi-zone controls. Small modular shop offices and enclosed employee break areas located throughout the areas proposed to support this activity are generally cooled using window or wall-type air conditioners.

4.0 Electrical Supply & Distribution System.

Main Supply Substation: American Electric Power provides Primary 138 KVAC to the main electric substation at JSMC-Lima. The main substation is comprised of 3-10,000 / 12,500 KVA OA/FA 138 KV, 3ph, 4w, Primary / 13,800 / Y7950V, 3ph, 4w, (Resistance Ground) Secondary Transformers w / automatic transfer switching, and power factor correction capacitors
Plant System: 6 major substations, 13.8 KVAC / 4160 / 480 VAC; distribution systems, 4160 / 480 / 277 / 208 / 120 VAC.

5.0 Electrical Bus Duct System.

The entire existing manufacturing area proposed for use in performing this activity and most of the warehouse areas proposed for support of this activity are served by a bus duct system. The individually fused 480 VAC, 3ph bust ducts are rated at 600, 1,000, and 1,200 amp capacity and are supplied though 1,200 amp capacity main distribution panel circuit breakers. At numerous locations throughout the manufacturing areas proposed for use in performing this activity, 120 VAC quadraplex and duplex receptacles are available. They have been provided modular shop offices and in support of Foreman's stations, data entry terminals, and specific production related task requirements.

6.0 Manufacturing Lighting System.

All manufacturing areas that are proposed for use in performing this activity are of Metal Halide, and primarily High Pressure Sodium, H.I.D. The foot candles readings taken at floor level have historically been measured at 60 to 80 foot candles. All manufacturing lighting is of 480 volts and is controlled by local switching at centralized locations.

All office area lighting was recently upgraded. They currently lighted with T-8 “mercury free” fluorescent lighting with local control switching.

7.0 Fire Protection System.

All manufacturing, warehousing and office areas at JSMC-Lima are covered at all elevations by automatic sprinkler systems, using water, Halon, and AFFF. Fire water is supplied by a dedicated, looped, fire water distribution system, which is power by a diesel engine powered fire pump, rated at 2000 gpm with 100 psi total discharge head. Water flow, discharge, heat activated detector, ultraviolet fire sensor, and manual pull boxes are used throughout the facility as the application may dictate. Alarm signals are converted to fiber optic signal for transmission to the Security Control Room, the 24 hour central monitoring command center for all possible facility emergencies. Intrusion detection is primarily controlled by the high level of manned security that is maintained 24 hours a day at JSMC-Lima. Patrols of the secured perimeter are performed on a frequent, random basis along with electronically logged “Detex” foot patrols. All buildings are located within this secured perimeter. Additionally, a badge scanning building access / control system provides access by authorized employees to those buildings that are time locked during off-production hours.

8.0 Compressed Air System.

The existing compressed air system serving the buildings that are proposed for use in performing this activity includes: 3 - 900 hp, 4,000 cfm; 1 - 400 hp, 2,000 cfm centrifugal air compressors, and 2 - 350 hp 1,500 cfm reciprocating air compressors for a total of 17,000 cfm total output capacity. Delivery is at 100 psi through 4 refrigerated air dryers coalescing filters, a carbon monoxide monitor, and the plant air distribution system loop with includes 6 receiver tanks located along the loop. Compressed air drops are configured with valve, filter, regulator and quick disconnect and are available as required at operator level. Breathable compressed air is provided to blast and paint booths through remote secondary carbon monoxide monitors.

9.0 Water and Sewer Systems.

Domestic water service is provided by the City of Lima, Department of Utilities through a 16 inch ductile iron water main constructed by JSMC-Lima in 1990. The supply is loop backed on approximately a mile square grid. Once delivered to JSMC-Lima through a 10” duplex meter it is supplied to a 400,000 gallon elevated storage tank through a pilot regulated altitude valve and maintained at an elevation of approximately 130 feet above ground level. Domestic water distribution is maintained at approximately 55 psi through an 8” dia. cast iron loop system with sectional control isolation valves. Backflow protection is provided at city service and at each process service.

Sanitary sewer arterial and collector lines for the combined domestic and industrial area discharge are constructed primarily of premium joint concrete, vitreous clay, PVC plastic, and cast iron. Flow and access is through a combination of brick and pre-cast premium joint concrete manholes. There are 3 satellite lift, (pump), stations on arterial sewers that flow to a 3,000 gallon wet well in the primary lift station at Building S-52. From the primary lift station, sewage is metered and pumped approximately 5,700 feet to the nearest gravity flow sewer manhole to The City of Lima sewer system along South Dixie Highway to the north and east of JSMC-Lima. There is an additional public sanitary sewer system of similar construction that serves the JSMC-Lima. The Final Prep and Ship Building, discharges through a system of premium joint ductile iron and pre-cast concrete manholes. The flow is totally by gravity to the Allen County Sanitary District, Shawnee #2 system.

10.0 Parking Areas.

Asphalt paved, striped, drained, and lighted parking areas are provided for all employees at the JSMC-Lima facility. The total number of parking spaces is approximately 1,282 spaces, in the main parking lot which is outside of the security controlled area. Additional employee parking lots are constructed within the secured perimeter of the facility, but are not being used due to the elevated level of security which may continue indefinitely.

11.0 Paving Surfaces.

All access road surfaces leading to the buildings that are proposed for use in performing this activity are constructed of either bituminous asphalt or reinforced concrete. The type of surface, base and sub-base design and construction varies with the activity that is being performed, and anticipated traffic loading. As JSMC-Lima has historically been involved with the production of heavy tracked combat vehicles, proper pavement design and construction is of significant importance.

12.0 Building Codes Compliance.

Although the original JSMC-Lima production facility buildings proposed for use in performing this activity were constructed as long ago as 1942, all original buildings and newer buildings have been updated and upgraded on numerous occasions. Continuing improvements are made in a timely manner to ensure that buildings continue to meet all applicable federal, state and local government codes including OSHA, Ohio Basic Building Codes, BOCA, ADA, NFPA, etc.

13.0 Security Fencing.

The secured perimeter, (approx. 5.93 mi.), of the entire active JSMC-Lima facility is secured by 7'-0" high, 9ga. galvanized, 2" mesh, woven steel wire, "Chain Link" fence. The fence is constructed with 9ga. galvanized steel top and bottom wires in lieu of top and bottom rails, and includes 3 strands of 4 point barbed wire mounted above the fabric on angled supporting arms. Gates where required, are constructed in like manner, secured by Government-approved chain and padlocks.

14.0 Hard Stand, General Outside Storage Area.

As JSMC-Lima has historically, (since its construction 1942), been involved with the production, modification, repair, alteration and storage of tracked and wheeled configurations of tactical and non-tactical vehicles. Many of these activities involved the storage of these vehicles, sometimes in large numbers. The main open "Hard Stand" general storage area at JSMC-Lima covers approximately 85,000 square yards, or nearly 17.6 acres. In addition, many other paved areas, including former parking areas within the secured perimeter are available for parking/storage of vehicles.

15.0 Existing Buildings Condition and Maintenance.

All buildings structure, exterior envelope, mechanical systems, electrical systems, supporting utility infrastructure, parking pavement and roof at JSMC-Lima that are proposed for use in performing this activity are continually maintained in "A1" condition. General Dynamics Land Systems, the Operating Contractor of JSMC-Lima maintains an in-house Maintenance Department that is staffed with all skilled and non-skilled-trades disciplines. Through the Preventive and Corrective Maintenance Programs of GDLS routine maintenance is regularly performed on a timely basis, keeping JSMC-Lima in top notch operating condition at all times.

16.0 Facility Recording.

Basic Information Maps of the Site as well as building floor layouts of all buildings, utilities, equipment including as built drawings and CAD/CAM records are maintained.

17.0 Automotive Type Testing.

The JSMC-Lima facility has been conducting automotive testing on test facilities specifically designed for land based tracked combat vehicles since the facility was constructed in the 1940's. The existing high speed test track can readily accommodate sustained speeds of 45 mph up to as high as 70 mph from tracked vehicles in excess of 60 tons/ 120,000 pounds. Pivot pad / test slope facilities are designed for precision calibration /quality testing of tactical vehicles with highly sophisticated ballistics systems.

17.1 Test Track.

The existing high speed test track facility at JSMC-Lima is described as follows:

- 1.21 mile specially constructed asphalt oval and 0.75 mile diagonal bisector with concrete turning islands and pivot pads. Note: The diagonal bisector permits half-oval operation with the remaining half-oval available for maintenance/repair.
- Curves are super-elevated transitioning from 0^0/0% to 11.7^0/13%.
- Asphalt pavement surface of 59.0' wide in straight-aways, to 61.2' wide in curves.
- Photo cell activated general roadway lighting, allowing for night time testing.
- The test track facility is equipped with all appropriate safety warning signs, electronic zoned trip wire circuits with alarm notification to the Plant Security Control Room, and noise attenuating barrier fencing.
- Directional indicating traffic lights and electronic directional indicator signs with verbal and graphic displays.

17.2 Support Testing.

Additional testing will be performed in the 75-acre site of the test track. This will required the ability to support the following:

- Paved Pivot Pad and Slope Test Area, approximately 150 ft by 250 ft
- Cross Over Stability course
- Parallel Bump course
- Fueling area with elevated duplex dispensing with state-registered 20,000 gallons storage currently utilizing JP-8.
- Surveyed navigational and target pads at the JSMC-Lima support test facility include a 500 meter IVC for dynamic error determination and calibration of the M1-A2 POS/NAV system. This course and an M1-A1 AIM North Finding Module error determination and calibration course were established from land and GPS survey datum and are tied to UTM, MGRS, LAT/LONG and facility coordinates with first order accuracy.

18.0 Available Transportation.

18.1 Rail

In addition to having its own on site 4.6 mile rail trackage system consisting of mainline, yard ladder track siding system, and a 250 ton rail scale, JSMC-Lima is unique in commercial transportation resources availability. Two commercial rail spurs, CSX and Norfolk-Southern, access the facility from opposite sides, providing readily available services and the utmost in competitive pricing. These rail services interconnect within the Lima area with other major rail systems. Those other area commercial rail freight services include Conrail (CSX), Norfolk-Southern, Indiana & Ohio and R.J. Corman. These combined Class I and shortline services create an unequaled grid on long-haul transportation options.

18.2 Truck

Joint Systems Manufacturing Center- Lima (JSMC-Lima) has the capability and experience to transport Hull and Weapon Station structures shipments with width's of 10 feet and a height's of 7 feet. JSMC-Lima routinely transports large structures via truck. These shipment are routed via access to Interstate I-75 (north/south) and U.S. 30 (east/west), and five major state routes - 309, 117, and 81 (all east/west), 65 and 66 (north/south). Both LTL and TL overnight services are provided by 32 freight companies with several Lima-based carriers providing "just-in-time" movement of production support material.

18.3 Air

JSMC-Lima is located 5 miles from The Allen County Airport which is a regional fixed base operator airport has with a 5,149 foot lighted runway, all-weather landing facilities equipped with ILS (Instrument Landing System), and jet fuel and maintenance service for all types of aircraft. The airport is capable of accommodating aircraft up to the size of a 727 or DC9. Commercial air service is available at Dayton international Airport and Toledo Express airports, each only 65 miles from JSMC-Lima.

19.0 Information Technology Systems.

19.1 Computer Rooms

Existing within the JSMC-Lima facility is an approximately 2,000 sq. ft., computer room with a raised / removable tile floor. Several additional computer rooms / areas exist at the facility.

19.2 Power Supply

The 2,000 sq. ft. computer room has a minimum of 200 KVA service. The additional computer rooms have similar services.

19.3 HVAC

HVAC systems are interlocked to fire and water detection alarm systems in all computer areas. These interlocks automatically shut down the HVAC systems in the event of a halon discharge or water flow detection.

19.4 Halon Protection

Fire suppression systems using Halon 1301 are still routinely maintained in operating condition, in all dedicated computer rooms.

19.5 Conditioned power

Power quality data recordings indicated no critical requirement for additional dedicated power conditioning of computer room power supplies.

19.6 Back-up Power

All computer servers are equipped with UPS's that provide reliable, graceful, and unattended shutdown of computer systems. (3 hours minimum battery back-up). PBX back up is provided separately.

19.7 Alternate Power Source

Three alternate primary power sources are available through the main power substation transformers in the event of a failure. Numerous grid arrangements available through the aerial distribution system can readily be accomplished to provide power to the facility computer rooms.

19.8 Badge Reader Access

A badge scanning building access / control system provides access by authorized employees to computer rooms and buildings that are time locked during off-production hours.

19.9 Location of Computer Room

Existing computer rooms are located away from windows, and exterior walls

19.10 Phone Closets

There are 56 voice/data closets that reside on the facility

19.11 Wiring

Voice is on CAT3 wiring and Data Jacks are on both CAT5 and CAT7 wiring with 100 MB fiber backbone existing to accommodate future CAT7 requirements.

19.12 Optional PBX w/Voice Mail

Existing SL1NT PBX to be upgraded to Nortel option 61C PBX in first quarter 2003. It will be capable of 1200 ports with 800 ports cut over at the time of installation.

19.13 Fiber Optic Cable

Fiber optic cable does exist between all major buildings.

20.0 Local colleges / Universities.

- **James A Rhodes State College, Lima, Ohio** serves the educational needs of Allen and surrounding counties by providing over 90 associate degree and certificate programs in business, health, public service and engineering and industrial technologies.
- **The Ohio State University at Lima, Ohio** a wide range of course offerings and several four-year degree programs are available at the Lima Campus. OSU Lima also provides a significant resource to local companies for continual employees skills upgrades and lifelong learning.
- **Ohio Northern University, Ada, Ohio** features Colleges of Arts and Sciences, Business Administration, Engineering, Pharmacy and Law.
- **The University of Northwestern Ohio, Lima, Ohio** provides state-of-the-art automotive/diesel high performance/motor sports education facilities, as well as comprehensive computer, business and health-related education programs. Two year and four year degree programs are available.
- **Bluffton College, Bluffton, Ohio** offers 38 undergraduate majors, 35 undergraduate minors and two master's programs.
- **Mount Vernon Nazarene College - The Executive Center For Lifelong Learning (EXCELL)** is committed to providing an opportunity for adults to obtain a quality education in a learning environment as a resource for adults striving to enhance their personal and professional lives in a constantly changing world.
- **Tiffin University - Lima Degree Center, Lima, Ohio** offers students the opportunity to earn a Bachelor of Business Administration degree with a major in management or accounting, or a Bachelor of Criminal Justice degree, with a major in law enforcement or corrections.

21.0 Utility sources, rates and costs:

- Natural Gas
  - Source: Dominion East Ohio, 800-362-7557, (as carrier);
    AES NEWENERGY, Inc., (614) 744-2779, (as supplier);
  - Service: 6 inch main, 40 PSI ±
    2001 Usage / Rate: 39,325,000 CF / $ 0.0054 per CF
    2001 Total Cost: $ 211,983.56, (cost paid by Government)
- Electricity
  - Source: American Electric Power, 800-672-2231
  - Service: Plant System: 6 major substations (13.8 KVAC / 4160 / 480 VAC), 4160/480 VAC distribution systems.
    2001 Usage / Rate: 36,456,000 KW / $ 0.042
    2001 Total Cost: $ 1,523,677.38, (cost paid by Government)
- Steam Supply
  - Source: Plant System: 3 Industrial Coal Fired Boilers,
    50,000 / 50,500 / 75,000 lbs. Steam/Hr.

1 Industrial Gas Fired Boiler, 60,000 lbs. Steam/Hr.
Service: Steam Distribution / Condensate Return Loop System

- Compressed Air
  Source: Plant System: 3 - 900 hp, 4,000 cfm; 1 - 400 hp, 2,000 cfm, 2 - 350 hp, 1,500 cfm compressors = 17,000 cfm total output capacity
  Service: 100 psi Plant Air Distribution System Loop with 6 receiver tanks

- Water
  Source: City of Lima, Department of Utilities, 419-221-5294
  Service: 16 inch ductile iron water main, looped, (constructed 1990): 400,000 gallon elevated, (135') storage tank.
  2001 Usage / Rate: 3,152,200 cubic feet, (23,581,608 gallons) / $ 0.012 per c.f., ($ 0.0016 per gal.)
  2001 Total Cost: $ 37,884.09, (cost paid by Government)

- Sewer
  Primary Source: City of Lima, Department of Utilities, 419-221-5294
  Service: Single domestic / industrial discharge through 6 inch force main of approximately 5,700 ft. long), categorized as a major user, direct discharge, no pretreatment required.
  2001 Discharge / Rate: 4,764,600 cubic feet, (35,643,973 gallons) / $ 0.029 per c.f., ($ 0.0039 per gal.)
  2001 Total Cost: $ 138,371.19, (cost paid by Government)

- Waste Management
  Source: Waste Management of Ohio, Lima, 800-433-0763
  Service: Hauling and Disposal; Landfill (Domestic / Industrial Solid Waste), and Landfill (Construction Debris)
  On site equipment, (provided by Waste Management):
  1 – Pre-crusher / compactor unit w/ 50 cy enclosed container,
  2 – Compactor Units, 6cy, w/ 50 cy enclosed container,
  1 - 30 cy open top rolloff box,
  1 – 20 cy open top rolloff box,
  2001 Volume / Rate: 1,907 tons / $ 54.82 per ton
  2001 Total Cost: $104,547, (cost paid by GDLS overhead)

22.0 <u>Communications.</u>

Availability (Level of Technology)
Source: Sprint, 800-901-9675 (Single Line), 419-226-6276 (PBX-Network)
Service: Data: 100 MB is either existing or is available to all desktops locations
Voice: Nortel, SL1NT PBX existing. To be upgraded to option 61C PBX in March, 2003. Capacity with upgrade will be 1200 ports with 800 ports cut over at installation

Satellite Communication
Building / Facility is capable of having Satellite Communication Dish installed with VSAT Satellite Communication Suite (WAN) with frequency approvals for computer connectivity. Capable of being cleared for the Ku spectum (11.70 – 12.20 GHz).

23.0 Regulatory Land Use Approvals.

The JSMC-Lima Facility is and has been owned by the United States of America since the early 1940's. Due to this ownership tenure, and its status as a Federal Sovereignty, JSMC-Lima is exempt from local zoning and land use restrictions. No additional regulatory land use approvals will be required.

24.0 Written Building Summary Description.

The required total 450,000 square feet required for this activity will provided from available space in existing buildings at the 1,634,517 square foot JSMC-Lima. Included also is the required 100,000 square feet of office space from the approximately 105,000 square feet existing at JSMC-Lima.

The buildings that are proposed for use in performing this activity are all of insulated steel siding and masonry construction, some with concrete block sill wall. The buildings all feature floors of minimum 8 inch thick poured concrete, reinforced and non-reinforced. Roofs vary in type and construction, primarily due to application and requirement. Flat surface roofs of metal, concrete, or wooden decks can be found, primarily over the manufacturing areas. Roofing systems range from the classic BUR (Built Up Roofing) with rigid or semi-rigid insulation board covered with gravel ballast to rolled roofing. Major portions of roofing consist of loose laid EPDM (Ethylene Propylene Diene Monomer synthetic sheet rubber membrane), with concrete ballast insulation, while others are single ply exposed EPDM over rigid insulation board.

Office space is abundant at JSMC-Lima with numerous individual offices ranging in size from 60 - 300 sq. ft. Meeting rooms and conference areas are strategically located and range from 300 - 2800 sq. ft. Office, conference and administrative area construction varies slightly from building to building but is generally comprised of conventional wood or metal stud framing with painted or textured vinyl dry wall, vinyl tile or carpet floor. Ceilings are typically 9 foot high suspended ceiling, fluorescent lighting, hollow and solid core wood or metal doors with dead bolt lock sets. Open office areas are located in all buildings and are subdivided with cubical partitions systems.

The primary manufacturing bays as proposed are generally 80 ft. by 40 ft. and 100 ft. by 40 ft. open floor area. Other manufacturing support areas that are available for this activity are comprised of bays with open of 40 ft. by 40 ft. Truss clearances from the bottom of the roof trusses to the floor range from 45 ft. to 50 ft. in primary manufacturing areas. Other manufacturing support areas that are available for this activity have truss clearances from the bottom of roof trusses to the floor of 20 ft.

The JSMC-Lima facility is a modern heavy manufacturing facility in all respects. The structure of the primary manufacturing areas proposed for use in performing this activity are of steel frame, high bay construction. Existing plant areas are dedicated to the entire manufacturing process for weldment fabricated tactical combat vehicles. Specifically those processes include shape cutting, fabrication, machining, assembly, painting, qualification testing, and delivery. Support activities include dedicated areas for warehousing, shipping and receiving, production, facility and non-tactical vehicle maintenance, as well as a physical plant with abundant steam and compressed air generating capacities.

Throughout the manufacturing warehousing and office areas that are proposed for use in performing this activity are fully enclosed air conditioned employee break areas. These break areas include vending machines, tables and CCTV to facilitate employee notices as well as commercial broadcast capabilities.

The secured perimeter, (approx. 5.93 mi.), of the entire active JSMC-Lima facility is secured by 7'-0" high, 9ga. galvanized, 2" mesh, woven steel wire, "Chain Link" fence and includes 3 strands of 4 point barbed wire mounted above the fabric on angled supporting arms. Gates where required, are constructed in like manner, secured by Government-approved chain and padlocks. Selected areas have CCTV coverage. Intrusion detection is primarily controlled by the high level of manned security that is maintained 24 hours a day at JSMC-Lima. Patrols of the secured perimeter are performed on a frequent, random basis along with electronically logged "Detex" foot patrols. All JSMC-Lima buildings are located within this secured perimeter. Additionally, a badge scanning building access / control system provides access by authorized employees to those buildings that are time locked during off-production hours.

Building heat is supplied by steam or gas unit heaters or coils in air handler, make up air units, heat recovery type exhaust/make up units and conventional supply and exhaust fans. Large office areas and conference facilities are all cooled by central chillers using pneumatic and electric multi-zone controls. Small modular shop offices and employee break areas located throughout are cooled using window or wall-type air conditioners. Throughout the JSMC-Lima various ages and types of equipment are currently in service. As a result of continuous preventive and corrective maintenance programs there are no major investments for repairs are expected at this time.

Energy management systems exist in various configurations in areas where the application justifies, primarily where energy consumption or quality assurance criteria is dependent on climate control.

The JSMC-Lima Facility is and has always been a heavy manufacturing facility in all respects. As such numerous overhead cranes of many varieties are currently in place, and well maintained as a result of continuous preventive and corrective maintenance programs. Applicable annually updated certifications are maintained on all major overhead bridge cranes. No major investments for repairs or upgrades are expected at this time. The significant types and quantities of existing cranes and hoists available for use in performing this activity are as follow:

- 40 - top-running, rail-mounted overhead bridge cranes, DC or AC powered, digital radio controlled, single and double trolley, 5 - 70 ton capacities
- 1 - dual gantry, rail-mounted floor level crane, 80 ton total capacity
- 51 - underhung cranes, AC powered, pendent controlled single trolley, 1 - 5 ton capacities
- Numerous jib cranes, AC Powered, pendant controlled ½ ton - 2 ton capacities

State of the art painting facilities at JSMC-Lima are readily available to accommodate the activities that are proposed. The significant types and quantities of existing paint booths in support of three distinct production painting operations are as follow:

- Small Parts Paint Line: 3 - 300 sq. ft. downdraft water curtain booths with overhead monorail conveyor system, flash off areas, drying oven steam heated and gas fired make - up air units.
- Structures Paint Line: 3 – 1,064 sq. ft. downdraft water curtain booths with drag line conveyor system, flash off areas, drying oven, pre - paint wash booth and gas fired make - up air units.
- Final Paint Line: 1 - 1600 sq. ft. & 1 – 840 sq. ft downdraft dry filter booths w/ drag line conveyor system, flash off areas, drying oven, pre - paint wash booth, steam heated make - up air units.

As JSMC-Lima has operated as a heavy manufacturing facility in all respects, the quality and capacities of the existing electrical systems more than adequate and readily available to accommodate the activities that are proposed. The JSMC-Lima electrical system is briefly described as follows:

- Main Supply Substation: American Electric Power provides Primary 138 KVAC to the main electric substation at LTP. The main substation is comprised of 3-10,000 / 12,500 KVA OA/FA 138 KV, 3ph, 4w, Primary / 13,800 / Y7950V, 3ph, 4w, (Resistance Ground) Secondary Transformers w / automatic transfer switching, and power factor correction capacitors
- Plant System: 6 major substations, 13.8 KVAC / 4160 / 480 VAC; distribution systems, 4160 / 480 / 277 / 208 / 120 VAC.

Dedicated computer rooms at the JSMC-Lima facility are modern, and vary in size and security levels depending on the security and sensitivity classification of the data being managed. Raised floors are utilized in specific applications and computer rooms are strategically positioned to prevent unnecessary risk due to natural disaster. Climate controls are designed in accordance with specific computer systems requirements. Safe shut down backup power systems are provided and power systems are interference filtered and surge protected. Halon fire suppression systems are provided in dedicated mainframe and cad-cam rooms.

All manufacturing, warehousing and office areas at JSMC-Lima are covered at all elevations by automatic sprinkler systems, using water, Halon, and AFFF. Water flow, discharge, heat activated detector, ultraviolet fire sensor, and manual pull boxes are used throughout the facility as the application may dictate.

Alarm signals are converted to fiber optic signal for transmission to the Security Control Room, the 24 hour central monitoring command center for all possible facility emergencies.

Asphalt paved, striped, drained, and lighted parking areas are provided for all employees at the JSMC-Lima facility. The total number of parking spaces is approximately 1,282 spaces, in the main parking lot, which is outside of the security controlled area. Additional employee parking lots are constructed within the secured perimeter of the facility, but are not being used due to the elevated level of security which may continue indefinitely.

The LTP facility has shipping/receiving dock facilities that have adequate capacity to accommodate the all activities that are proposed. Dock facilities at JSMC-Lima can briefly be described as follows:

- 7 - heated, enclosed, inclined docks with dock levelers, lights and air seals
- 1 - elevated dock, dock levelers, lights and air seals
- 1 - elevated docks, dock levelers
- 3 - elevated docks, dock ramp
- 1 - mobile drive up ramp
- 1 - enclosed railroad flat car drive on.

Two production fuel storage and dispensing facilities consisting of a 20,000 gallon storage area and a 12,000 gallon storage area with elevated dispensing. A non-production area with a 6,000 & 4,000-gallon storage tanks. All fueling areas are covered and equipped with heat detection, fire suppression and spill containment systems.

Rail facilities at JSMC-Lima include 4.6 mile rail trackage system consisting of a mainline, yard ladder track siding system, and a 250 ton rail scale with commercial support through two spurs from two major carriers.

Utility services are provided to the JSMC-Lima facility through the following firms:

American Electric Power
369 East O'Connor Avenue
Lima, Ohio 45801
800-672-2231
800-672-2232

Dominion East Ohio Gas Company
West Ohio Gas Division – Lima
150 S Jackson St.
Lima, Ohio 45801
419-226-4866
800-877-4715

Sprint (Telephone)
122 South Elizabeth Street
Lima, Ohio 45801
800-901-9675 (Single Line)
419-226-6276 (PBX-Network)

City of Lima Utilities Department
50 Town Square
Lima, Ohio 45801
419-221-5294

Waste Management
1550 East Fourth Street
Lima, Ohio 45804
419-221-3644

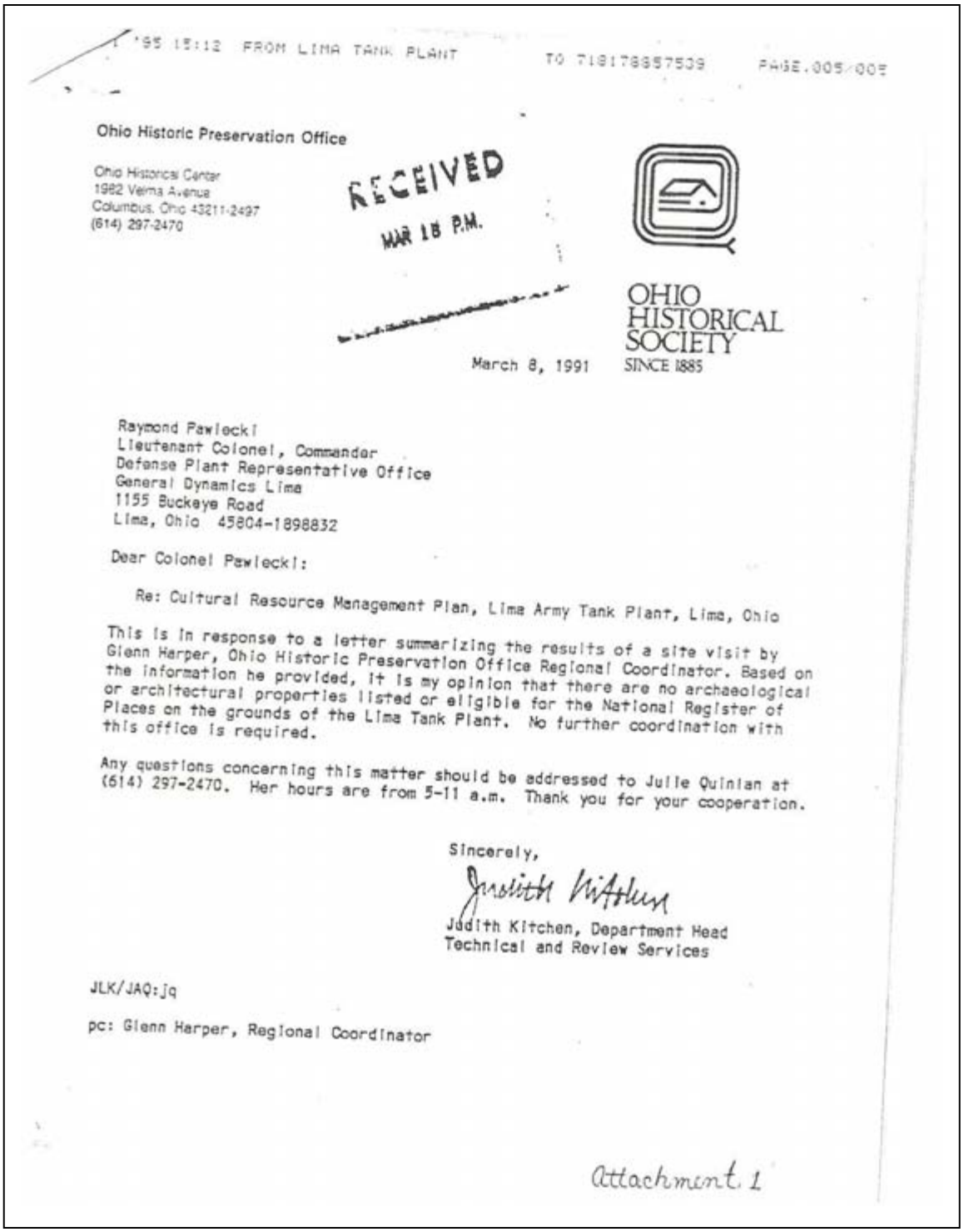
Time Warner Cable
3100 Elida Road
Lima, Ohio 45807
419-331-1111

The JSMC-Lima Facilities Department Real Property Records include all chain of title information pertinent to the acquisition of the properties comprising the facility as it exists today. The US Government has been the owner of record since the 1940's. No encroachments, boundary disputes, ownership conflicts, or title

clouds have been recorded to date. If so required a request for the ALTA, (**A**merican **L**and **T**itle **A**ssociation), can be processed along with a current title report.

Appendix D - Official Correspondence and Reports

Exhibit D.1 - Correspondence from Ohio Historical Society



'95 15:12 FROM LIMA TANK PLANT TO 71917885753 PAGE.005/005

Ohio Historic Preservation Office

Ohio Historical Center
1982 Velma Avenue
Columbus, Ohio 43211-2497
(614) 297-2470

RECEIVED
MAR 18 P.M.

OHIO HISTORICAL SOCIETY
SINCE 1885

March 8, 1991

Raymond Pawleckl
Lieutenant Colonel, Commander
Defense Plant Representative Office
General Dynamics Lima
1155 Buckeye Road
Lima, Ohio 45804-1898832

Dear Colonel Pawleckl:

Re: Cultural Resource Management Plan, Lima Army Tank Plant, Lima, Ohio

This is in response to a letter summarizing the results of a site visit by Glenn Harper, Ohio Historic Preservation Office Regional Coordinator. Based on the information he provided, it is my opinion that there are no archaeological or architectural properties listed or eligible for the National Register of Places on the grounds of the Lima Tank Plant. No further coordination with this office is required.

Any questions concerning this matter should be addressed to Julie Quinlan at (614) 297-2470. Her hours are from 5-11 a.m. Thank you for your cooperation.

Sincerely,

Judith Kitchen

Judith Kitchen, Department Head
Technical and Review Services

JLK/JAQ:jq

pc: Glenn Harper, Regional Coordinator

Attachment 1

Exhibit D.2 - Title Page and Executive Summary of Historical Properties Report

HISTORIC PROPERTIES REPORT

LIMA ARMY TANK PLANT, OHIO

FINAL REPORT

JULY 1984

This document was prepared under Contract CX-0001-2-0033
between Building Technology Incorporated, Silver Spring, Maryland
and the Historic American Building Survey/Historic American
Engineering Record, the Natiinal Park Service,
U.S. Department of the Interior

EXECUTIVE SUMMARY

A part of the U.S. Army Tank Automotive Command (TACOM), Lima Army Tank Plant is a government-owned, contractor-operated facility responsible for manufacturing, shipping, and testing M-1 Abrams tanks and for providing select major tank components to Detroit Arsenal for assembly. Located about five miles south of the center of Lima, Ohio, the installation is situated on 373 acres and is composed of 48 buildings. The original contractor-operator, the Ohio Steel Foundry Company, directed initial construction at the site starting in May 1942. The Army conceived of the facility as a plant for manufacturing centrifugally cast gun tubes, but before production began it converted it to a tank depot for modifying and processing combat vehicles for export and domestic shipping. After World War II, as the Lima Ordnance Depot, the installation principally stored and preserved military vehicles. During the Korean War it reinitiated the modification and preparation of tanks for combat, but following the war there was only minor activity until Lima was selected in August 1976 as the initial production site for the M-1 tank. Since that time the facility has undergone considerable modification. The present contractor-operator of the tank plant is General Dynamics Corporation, Land Systems Division. There are no Category I, II, or III historic properties at Lima Army Tank Plant.

Exhibit D.3 - Correspondence from Ohio Dept of Natural Resources: Subject: Rare or endangered

Ohio Department of Natural Resources

BOB TAFT, GOVERNOR SAMUEL W. SPECK, DIRECTOR

Division of Natural Areas and Preserves
Stuart Lewis, Chief
1889 Fountain Square, Bldg. F-1
Columbus, OH 43224-1388
Phone: (614) 265-6453; Fax: (614) 267-3096

May 8, 2001

Michael Thomas
mrt Environmental Management Group
2555 Capeside Drive
Okemos, Michigan 48864-2827

Dear Mr. Thomas:

After reviewing our Natural Heritage maps and files, I find the Division of Natural Areas and Preserves has no records of rare or endangered species in the Lima Army Tank Plant project area, including a one mile radius, on the Cridersville and Lima Quads, Allen County.

There are no existing or proposed state nature preserves or scenic rivers at the project site. We are also unaware of any unique ecological sites, geologic features, breeding or non-breeding animal concentrations, champion trees, or state parks, forests or wildlife areas within a one mile radius of the project area.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Please note that although we inventory all types of plant communities, we only maintain records on the highest quality areas. Also, we do not have data for all Ohio wetlands. For additional information on wetlands and National Wetlands Inventory maps, please contact Jim Given in the Division of Real Estate and Land Management at 614-265-6770.

Please contact me at 614-265-6818 if I can be of further assistance.

Sincerely,

Debbie Woischke

Debbie Woischke, Ecological Analyst
Support Services Group