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PHASE I ENVIRONMENTAL SITE ASSESSMENT

Federal Center
4300 Goodfellow Boulevard
St. Louis, MO 63120

Building No.: Various

Prepared for:
General Services Administration
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1500 East Bannister Road
Kansas City, MO 64131
January 24, 2002
MES Project No. MES-01-2001-0042

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SUPERFUND RECORDS

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APPENDIX

1.0 INTRODUCTION

Marc Enviro Services LLC (MES LLC) has been retained by General Services Administration of Kansas City, MO to perform a Phase I Environmental Site Assessment (ESA) on property identified as 4300 Goodfellow Boulevard Street, St. Louis, MO (herein referred to as the Site). The assessment Site encompasses 63.77 acres and is located east of Goodfellow Boulevard, south of Patch Street, west of Planned Industrial Drive, and north of Edelle Avenue, in St. Louis, Missouri. One structure, Building 208 B, was located a short distance north of the Site's northeast corner and is included in this ESA. This ESA is an instrument of service for the exclusive use of our Client; the Clients associated Government agencies and their lender(s) only. No third party may use this report, or any information contained herein. With the permission of the Client, MES LLC may authorize a third party to use this Report, and to rely on the information contained in this Report, but only to the same extent of the Client's reliance, and subject to the same contractual, technological, and other limitations to which the Client has agreed.

This ESA has been prepared to characterize existing environmental conditions on the subject property and to assess potential environmental concerns caused by activities/practices on adjoining and/or nearby properties. Conclusions and opinions have been based primarily upon background research, interviews and a site reconnaissance conducted on December 17th and 18th, 2001. The background research included:

> Review of recorded land records; examination of aerial photographs; interviews; a review of GSA's historic records on the Site; a review of prior government investigations and reports; and review of the current United States Geological Society (USGS) Topographic Map of the area;
>
> Review of records from the Missouri History Museum Library and Research Center and records from the St. Louis Public Library;
>
> Identification/location of known or suspected hazardous waste sites, permitted hazardous waste facilities, active/inactive solid waste facilities, nearby Resource Conservation and Recovery Act (RCRA) sites, nearby surface spill sites, and nearby registered underground storage tank (UST) and leaking UST (LUST) sites.

This ESA was conducted in general accordance with American Society of Testing Materials (ASTM) Standard E 1527-00, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. According to the Standard, ". . . the goal of the processes established by this practice is to identify recognized environmental conditions. The term recognized environmental conditions means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property . . . even under conditions in compliance with laws."[1] More simply stated, "The purpose . . . is to identify, to the extent feasible pursuant to the processes prescribed herein, recognized environmental conditions in connection with the property."[2]

Adherence to this Standard is intended to allow the user (or owner) to fulfill the requirement that "all

appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice,"3 under the innocent landowner defense in Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), was conducted.

This ESA did not include an analysis or determination as to whether the Client or Site is in compliance with Federal, state, or local laws, statutes, ordinances, or regulations. These services also did not include identification or evaluation of asbestos, asbestos-containing materials (ACM), lead-based paint (LBP), radon, lead in drinking water, regulatory compliance, cultural resources, historical or archeological resources, industrial hygiene, health and safety, endangered species, indoor air quality, mold issues, high voltage power lines, methane gas, or wetland identification/delineation. This ESA specifically excluded sampling or testing for the presence of hazardous substances, hazardous materials, hazardous wastes, petroleum, or polychlorinated biphenyls (PCBs).

It is important to note that this ESA does not constitute a guarantee or warranty of the environmental condition of the subject property. Additional stipulations concerning the findings of this report is discussed in Section 9.0 "Limitations".

2.0 SITE DESCRIPTION

2.1 SITE LOCATION AND VICINITY CHARACTERISTICS

The Site is identified as the property located at 4300 Goodfellow Boulevard, St. Louis, MO 63120. The assessment site consists of an irregular shaped parcel covering 63.77 acres known as the Federal Complex at 4300 Goodfellow Boulevard, St. Louis, MO. The property is approximately 1,500' (wide) X 2,000' (long) and has numerous office buildings. Four of the structures are quite large with several structures having lengths over 1,100'. The present use of the Site includes office buildings, a public school, automobile parking, a cafeteria, a recreation facility, support buildings, and a maintenance building. The Site was previously used as a portion of the St. Louis Ordinance Plant and constructed in the early 1940s primarily to fabricate Caliber .30 and Caliber .50 ammunition. This ammunition plant was the largest small caliber plant of it's kind in the world during the peak operations. Little evidence remains at the Site suggesting the earlier uses to fabricate the munitions. Much of the area was graded to accommodate the large automobile parking areas currently used at the Site. In addition large concrete bunkers for ammunition storage were removed. The Site is zoned as A (single family residential) and F (Neighborhood Commercial District) as governed by the Zoning District of St. Louis, MO.

The following is a listing of the current buildings at the Site in GSA's inventory.

Building Number	Building Name	Current Use
MO0601AF	Building 101	Thurgood Marshall Academy (Kindergarten-8th Grade)
MO0603AF	Building 102	Vacant
MO0604AF	Building 102 D	Vacant

MO0605AF	Building 102 E	Credit Union and Fleet Management
MO0606AF	Building 103	Defense Information Systems Agency (DISA)
MO0607AF	Building 103 D	Health Clinic and Defense Information Systems Agency
MO0608AF	Building 103 E	Federal Telecommunication Service (FTS)
MO0616AF	Building 103 F (originally this building was called Building 112).	Cafeteria
MO0609AF	Building 104	1st Floor - Veterans Admin. (VA) 2nd Floor - USDA & FSA
MO0610AF	Building 104 E	Child Care Facility & USDA Farm Service Agency
MO0611AF	Building 104 F	USDA and Office of Inspector General (OIG)
MO0612AF	Building 105	1st Floor - Vacant 2nd Floor - USDA Midwest Labs - Food Safety Inspection Service
MO0613AF	Building 105 E	Army Audit Agency (AAA)
MO0614AF	Building 105 F	Vacant
MO0615AF	Building 105 L	Training Rooms and Auditorium
MO0626AF	Building 106	Guard Shack
MO0602AF	Building 107	General Services Administration
MO0618AF	Building 110	Defense Financing Accounting

MO0617AF	Building 115	Fitness Center
MO0620AF	Building 122 B	Maintenance Shop
MO0625AF	Building 141 C	Food Safety Inspection Service Chemical Storage
MO0628AF	Building 208 B	Electrical Sub Station
MO0622AF	Building 108 A	Electrical Sub Station
MO0623AF	Building 108 B	Electrical Sub Station

The interiors of the structures are in excellent condition and appear well maintained. Buildings 104 and 105 are mostly vacant at present and have been rehabilitated for office spaces. Offices are located throughout these structures and the other various structures at the Site with mechanical equipment located in the basement and roof areas. A security gate is located on the Goodfellow Boulevard entrance to the main portion of the Site. A separate entrance to Building 101 is located also along Goodfellow Boulevard. No other accesses to either of these areas were observed. While the Building 101 area does not have security restricting access from Goodfellow Boulevard, the area is fenced in, thus restricting access from the area near Building 101 to the rest of the Site.

The Site has very little exposed soil and impervious surface improvements cover nearly the entire Site. The Site is serviced by electrical, sewer, telephone, natural gas and water utilities. Storm water appears to be routed from the roof of most of the structures directly to the City sewer system. The surface runoff at the Site is generally toward the east. The adjoining properties consist of idle Federal property, Lincoln Engineering, a truck distribution center, Job Corps, U.S. Army Reserve Center, and a fork truck shop.

The Site Vicinity Map - Figure No.: 01, which details the topography of the Site and the Site Plan - Figure No.: 02, which details the location of the Site, and the Current Photographs, are included in the Appendix. To assist the reader in identifying important structures on the Site, refer to Figure No.: 03, which is an aerial map dated 2000 that has been labeled.

The assessment Site is identified within the zoning district and city limits of the City of St. Louis, MO.

2.2 LEGAL DESCRIPTION

The assessment site consists of an irregular shaped parcel approximately 1,400' on the south (wide) X 1,700' on the north (wide) X 2,100' on the west (long) X 2,100' on the east (long) described as City Block 4350-000-1200. The Site is located in Township 46 North, Range 7 East, St. Louis, Missouri.

2.3 IMPROVEMENTS

There are twenty-four structures located on the Site where most of them are no more than three floors

with basements and penthouses. The primary use of the structures included office spaces and support structures for the office uses. Building 101 and the property immediately adjoining the structure was fenced and used as a kindergarten through 8th grade school with playground. Building 101 was fenced separating it from the remaining portion of the GSA property and the access to the school was through its own entrance effectively segregating the two uses of the Site. The Site is serviced by electrical, sewer, telephone, natural gas and water utilities and access is available to Goodfellow Boulevard by vehicles and pedestrians. Parking lots are located throughout the Site. The Federal Government and contractors utilize the portion of the Site, excluding the Building 101 area, as office spaces. A security gate operated by the Federal Government is located on the Goodfellow Boulevard entrance giving vehicular access to the entire Site, less the Building 101 area. No other major improvements were observed in the reconnaissance conducted on December 17th and 18th, 2001.

2.4 CURRENT AND PAST USE OF THE SITE

In researching the past use of this property, various sources were utilized. City Directories prior to 1912 were not practicably reviewable, and were therefore not included in this report. The Sanborn fire insurance maps were not available for the Site. However, aerial photography; the St. Louis City Assessor; the GSA's Site records; St. Louis City Assessor; the St. Louis Public Library; and the Missouri History Museum Library & Research Center were consulted for past uses between the early 1900s and present.

On October 29, 1941, the Federal Government condemned the property at the Site. Soon after this date, the property was used as a fabrication plant for small arms ammunition. The St. Louis Ordnance Plant manufactured small arms ammunition including Caliber .30 and Caliber .50 ammunition. Other activities at the plant included propellant storage, lead smelting, chemical storage, and vehicle maintenance. Located in Building 105's basement was an indoor shooting range. Storage for powder, priming, pyrotechnic and incendiary chemicals were provided off-Site at the Tyson Valley Powder Farm. Prior to the 1940s, Irene Lohmann owned the property at the Site and no industrial uses prior to the United States of America ownership were discovered. Residential unit(s) appeared on the Site along Goodfellow Boulevard along with a dairy operation between 1912 and 1925. Between 1936 and 1940, a Community Garden was located on the Site. In the 1940s, ammunition fabrication was a primary product of the Site. The incendiary components and raw products were either trucked or hauled into the various processing plants via rail for component fabrication. Raw explosive materials were stored in various bunkers awaiting use in the small caliber ammunition production. The cartridges were manufactured on Site using primarily impact shaping processes. Washing, annealing, oiling, and some lead smelting processes were common elements in the fabrication of the ammunition. The various stages in the manufacturing process are described in greater detain in Section 4.10 of this report.

In the mid-1970s, the property appeared to be partially idle with little uses. The Site was rehabilitated from the 1970s through present modifying it into a modern business park complex. There were no obvious environmental conditions associated with the site prior to the 1940s. Between 1941 and the end of the ammunition production, there remains some concerns of environmental conditions from the ammunition production processes using hazardous materials.

2.5 CURRENT AND PAST USE OF ADJOINING PROPERTIES

A visual inspection of the adjoining properties was conducted on December 17th and 18th, 2001. This inspection revealed adjoining properties, which included a truck distribution center, a fork truck maintenance facility, Lincoln Engineering, an Army Reserve unit, and idle Federal property.

Past uses of the adjoining property include Federal ammunition fabrication operations, vacant lots, residential units, a machine manufacturing business, gasoline stations, pharmacy, parking lots, lubricating devices, dental laboratory, church, job corps, office buildings, Army Reserve unit and agriculture uses. Dixie Manufacturing was located at 4200 Goodfellow between, 1932 and 1946, which was immediately south of Building 101.

City Phone Directories were used to make this determination.

2.6 TOPOGRAPHY

The Site is located on the United States Geological Survey (USGS) 7.5-Minute Series Clayton, MO Topographic Quadrangle. The topographic quadrangle was dated 1954 with photo revision date 1993. The property has an elevation ranging between 590 and 545 feet above mean sea level (msl).

The topography can be seen on the Site Vicinity Map - Figure No.: 01 in the Appendix. The scale of this map is 1" = 2,000' and it has a contour interval of 10'.

2.7 GEOLOGY

The Geologic Age and Rock Stratigraph Unit Source: P.G. Schruben, R.E. Amdt and W.J. Bawiec, Geology of the Conterminous US, depicts the strata as:

Geologic Age Identification	
Era:	Paleozoic
System:	Pennsylvanian
Series:	Missourian Series

Geologic Age Identification	
Category:	Stratified Sequence

Soils

The U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) is responsible for collecting, storing, maintaining and distributing soil survey information for private lands in the U.S. The SCS maintains the data in a system called STATSGO and this data depicts the site with the following characteristics:

Soil Component Name
Urban land

Soil Surface Texture
Variable (0 inches to 6 inches).

Hydrologic Group
Not reported.

Soil Drainage Class
Not reported.

Corrosion Potential
Not reported.

The assessment site surface soils were mapped by the United States Department of Agriculture (USDA) Soils Conservation Service (SCS) and described in the ***Soil Survey of St. Louis County and St. Louis City, Missouri.*** Surface soils mapped at the assessment site are as follows:

Map Symbol	**Mapping Unit**	**Description**
7B	Urban Land - Upland	0 to5 percent slopes.

The Urban land is located in areas where over 85 percent of the property are covered by asphalt and concrete materials. Cutting and filling to provide a nearly flat surface have extensively reshaped most soils in these areas. Detailed soil data is not available from the Soils Conservation Service due to the large variability presented from the reshaping of the soils. A copy of the Soil Survey Map for the Site is included in the Appendix as Figure No.: 06.

2.8 HYDROLOGY

Groundwater migration is assumed to be generally in an easterly direction at the Site. Local contours would help influence this groundwater migration. Currently, surface water at the street level typically flows away from the Site to the City sewer system, which routes flow easterly. The roof drainage is routed via drainpipes into the City sewer system. The adjoining SLOP and SLAAP facilities are sufficiently close to the Site where localized subsurface barriers may greatly impact groundwater direction. Information is not available on localized groundwater direction in the vicinity of the Site and would be required in order to determine how adjoining properties may have impacted the Site.

According to the EDR report, the Site is not located in the 500-year or 100-year flood plain.

3.0 RECORDS REVIEW

As part of this ESA, various sources of information were queried in an attempt to determine and evaluate past and present activities on and in the vicinity of the subject Site that might cause environmental impacts on the Site. Multiple aerial photographs and the current USGS Topographic Maps were obtained, and regulatory database research by Environmental Data Resources, Inc. (EDR) was performed. EDR is a database search firm, specializing in records searches for ESA's. These efforts were performed in general accordance with ASTM Standard E 1527-00. The ASTM Standard recommends approximate minimum search distances (AMSDs) for each type of database search, which are stated in Section 3.1, and were utilized in our review. The EDR Report is included in the Appendix.

3.1 ENVIRONMENTAL RECORDS REVIEW

The databases discussed in this section, provided by Environmental Data Resources (EDR), Inc. of Southport, Connecticut, were reviewed for information regarding documented and/or suspected releases of regulated hazardous substances and/or petroleum products on or near the Site. MES LLC also reviewed the "unmappable" listings within the database report, cross-referencing available address information and facility names. Unmappable sites are listings that cannot be plotted with confidence, but are identified as being located within the general area of the Site based on the partial street address, city name, or zip code. In general, a listing cannot be mapped due to inaccurate or incomplete address information in the database that was supplied by the corresponding regulatory agency. Any listings from the unmappable summary which were identified by MES LLC as a result of the area reconnaissance and/or cross-referencing to mapped listings are included in the corresponding database discussion within this section.

Federal Database Reviews

National Priorities Listing (NPL) – Environmental Protection Agency Superfund List

The NPL is a subset of the CERCLIS and lists over 1,200 properties that are ranked as high priority for cleanup under the Superfund program.
Source: USEPA NPL database updated July 26, 2001.

> Neither the Site nor other properties within a one-mile radius of the Site are listed on the Federal NPL or Proposed NPL.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) List

The CERCLIS List is a compilation of known and suspected uncontrolled or abandoned hazardous waste sites which are, or were, under investigation by USEPA but have not been elevated to the status of a Superfund (NPL) site.
Source: USEPA CERCLIS database updated July 12, 2001.

The Site is listed twice on the CERCLIS database. The first listing is under the St. Louis (Ex) Ordinance Plant. A Discovery and Preliminary Assessment were completed on November 01, 1979 and January 01, 1985, respectively. A pre-remedial aerial survey was completed on May 26, 2000. Mr. Gene Gunn of the Region VII EPA office stated that the St. Louis Ordinance Plant (SLOP), along with adjacent DOD property to the north and west of the Site called the St. Louis Army Ammunition Plant (SLAAP), is being evaluated. Mr. Gunn stated that EPA will ask the property owners to conduct investigative work and if they refuse, EPA will perform the investigation. Mr. Gunn believed that the USACE is involved with clean-up investigations to the north and west of the Site. Ms. Dianna Bailey, Project Manager for EPA Region VII was additionally contacted concerning the Site. She stated that a report titled "St. Louis Ordinance Plant Federal Facility - A Preliminary Assessment Review" was completed in February 2001. A copy of this report was not available from EPA at the writing of this report but reportedly recommends further investigation into Plant No. 1 and Plant No. 2 including environmental sampling in order to provide additional insight on the potential of contamination. Plant No. 1 includes the property at the Site.

The second listing is under the United States Forest Service in Building 105D. The EPA completed a Discovery on June 30, 1987. This investigation is common to Federal facilities where certain indicators, such as an EPA Generator Identification Number are used to trigger a Discovery. The Discovery is mandated by Federal law and where EPA site visits find little or non-existent environmental risks, or little potential for environmental risks, the investigation is not pursued. No further EPA activity followed the Discovery process in 1987.

There are no CERCLIS listings in the database within one-half mile of the Federal Building.

As of February 1995 CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites, where following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Superfund action.
Source: USEPA CERCLIS database updated July 12, 2001.

The Site is not listed on the CERCLIS-NFRAP database.

There are no facilities, listed in the CERCLIS-NFRAP database, within a one-mile radius of the Site.

Corrective Action Report (CORRACTS)

The Resource Conservation and Recovery Act (RCRA) program identifies and tracks hazardous wastes from the point of generation to the point of disposal. The CORRACTS database identifies hazardous waste handlers with RCRA corrective action activity.
Source: USEPA CORRACTS database updated September 20, 2001.

The Site is not listed on the CORRACTS database.

There are no facilities within one-mile radius of the Site listed on the CORRACTS database.

Resource Conservation and Recovery Information System (RCRIS)

The Resource Conservation and Recovery Act (RCRA) program identifies and tracks hazardous wastes from the point of generation to the point of disposal. The RCRIS database tracks those facilities that generate, transport, treat, store, and/or dispose of hazardous materials as defined by RCRA. A TSD transports, stores and/or disposes hazardous waste. A SQG is a small quantity generator and a LQG is a large quantity generator of hazardous waste.
Source(s): USEPA/NTIS RCRIS database updated June 21, 2000.

The Site is not listed as a LQG or a TSD. There are two Generator Numbers associated with the Site. The first Small Quantity Generator Number MO6123790002 is owned by the USDA Forest Service Midwestern Laboratory. The number is currently active. Eight low-level violations were reported between 1985 and 1999.

The second Small Quantity Generator Number MO2210090088, previously associated with the GSA, was investigated through the US Environmental Protection Agencies Envirofacts Warehouse web site, which is located at ***http://www.epa.gov/enviro/html/multisystem_query_java.html***. The number appears to have been inactive and is no longer used. No violations are associated with this number. No further information was available on the status of this number.

A review of the RCRIS list, as provided by EDR, has revealed that there are four RCRIS-SQG properties within approximately 0.25 miles of the Site and no RCRIS-LQG within approximately 0.25 miles of the Site. There are no RCRIS-TSD properties within the ASTM minimum search radius of the Site. The RCRIS-SQG facilities are listed below.

RCRIS-SQG Facility Name	Facility Address	RCRIS Designation
Sverdrup USAR Center	4301 Goodfellow Blvd. St. Louis, MO EDR Map ID A13	This Small Quantity Generator has had no violations found since the record date of June 02, 1995.

St. Louis Job Corps	4333 Goodfellow Blvd. St. Louis, MO EDR Map ID 14	This Small Quantity Generator has had ten low-level violations found due to an inspection in 1998. All issues were brought into compliance. The violations are typical of paper work problems and do not appear to be release related.
Able Lift Truck	4200 Goodfellow Blvd. St. Louis, MO EDR Map ID 15	This Small Quantity Generator has had no violations found since the record date of May 15, 1992.
USARC #2	4100 Goodfellow Blvd. St. Louis, MO EDR Map ID 16	This Small Quantity Generator has had no violations found since the record date of July 08, 1999.

Emergency Response Notification System (ERNS) Database

The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances.
Source(s): USEPA/NTIS ERNS database updated August 08, 2000.

The Site is not listed on the ERNS database.

State Database Reviews

State Hazardous Waste Sites (SHWS)

The State Hazardous Waste Sites database is a listing of facilities that are considered to be a threat to public health and welfare by the Missouri Department of Natural Resources.
Source: MDNR SHWS database updated September 30, 2001.

Neither the Site nor any properties within a one-mile radius of the Site are listed in the SHWS database.

Solid Waste/Landfill Facilities (SWF/LF)

The Solid Waste Facilities/Landfill Facilities database is a list of State permitted/recorded solid waste landfills or facilities.
Source: MDNR SW/LF database updated October 01, 2001.

Neither the Site nor any properties within a one-half mile radius of the Site are listed in the SW/LF database.

Leaking Underground Storage Tank (LUST) Database

The Missouri Department of Natural Resources (MDNR) Leaking Underground Storage Tank (LUST)

database contains an inventory of reported leaking underground storage tanks.
Source: MDNR LUST database dated August 23, 2001.

The Site was not listed in the LUST database.

There were seven properties, within a one-half mile radius of the Site, listed in the LUST database. A review of the locations of these LUST facilities revealed that there are two active LUSTs near the Site, which are potential recognized environmental conditions. The Site is situated on a topographical high area and ground water flow appears to be radial away from the Site. The LUST facilities remaining active appear to be down-gradient and lower in elevation as compared to the Site. Therefore, these remaining active LUST properties would not be a concern to the Site. All of the LUST within one-half mile of the Site is listed below.

LUST Facility Name	Facility Address	LUST Status
US Army 102D US ARCOM - AMSA/55/G	4301 Goodfellow Blvd. St. Louis, MO EDR Map ID A12	The Missouri Department of Natural Resources was contacted via the telephone concerning Lust ID No.: R002578. Three tanks were removed and cleaned up to State standards. A No Further Action letter was issued due to the remedial clean up activities.
Lincoln Div. McNeal Corp.	One Lincoln Way St. Louis, MO EDR Map ID D8	This is an inactive LUST facility where the clean up finish date was in 1997. The LUST is down gradient, or southeast, of the Site.
Madison Warehouse Corporation	4630 Goodfellow Blvd. St. Louis, MO EDR Map ID 19	This is an inactive LUST facility where the clean up finish date was in 1992. The LUST property is vertically down gradient by at least 20' and is north of the Site.
Morris Auto Repair	5842 Natural Br. Road St. Louis, MO EDR Map ID 20	This is an active LUST property, which is down-gradient from the Site. The LUST property is vertically down gradient by at least 10' and is over 2,000' south of the Site.
#717 - GNB Mobile Mart	5750 Natural Br. Road St. Louis, MO EDR Map ID 22	This is an inactive LUST facility where the clean up finish date was in 1989. The LUST property is vertically down gradient by at least 20' and is southeast of the Site.
Safi AMOCO	4207 Jennings Station St. Louis, MO EDR Map ID 23	This is an active LUST property, which is approximately 2,000' west-northwest of the Site. The flow gradient would be northeast of away from the Site.
Stanley & Lorraine Laiderman	5704 Natural Br. Road St. Louis, MO EDR Map ID 24	This is an inactive LUST facility where the clean up finish date was in 1992. The LUST is down-gradient and southeast of the Site.

Underground Storage Tank (UST) Database

The Missouri Department of Natural Resources Underground Storage Tank (UST) database contains an inventory of underground storage tanks.
Source: MDNR UST database dated August 23, 2001.

The Site was listed in the EDR Database as previously having three tanks with volumes

8,000-gallons (diesel), 300-gallons (diesel), and 10,000-gallons (gasoline). The EDR Report noted that all of these tanks were removed. MDNR was contacted to determine whether No Further Action status was granted concerning the UST removals. A No Further Action letter, dated April 13, 1999, was generated by the MDNR concerning an 8,000-gallon (diesel) and a 550-gallon (waste oil) tank. Based on conversations with MDNR, no USTs remain active at the Site and all USTs were closed. Further clarification was needed to determine the volume discrepancy between the 550-gallon versus the 300-gallon USTs and whether these were the same or different tanks. Mr. Crocker of the Site furnished a copy of a Public Buildings Service form dated March 26, 1998 completed by Mr. Todd Frazier to Mr. Bill Hoff. The form revealed that the Defense Information Systems Agency owned a 550-gallon waste oil tank and an 8,000-gallon diesel fuel tank. The correspondence also stated K & S Construction removed a 10,000-gallon gasoline tank in 1989 under contract number GS06P89GYC0022. Per conversations with Mr. Crocker, the 10,000-gallon UST had no releases and sampling verifying a clean closure was conducted.

Registration correspondence states that the 300-gallon UST was a waste oil tank and registered as such with MDNR. When the waste oil tank was removed in 1998, the contractor listed the tank as a 550-gallon waste oil tank. When the MDNR issued a No Further Action letter, it used the 550-gallon volume because that was listed as the volume of the tank that was removed. The 550-gallon and the 300-gallon USTs appear to be the same tanks. Correspondence from the MDNR was not available concerning the NFA status of the removal of the 10,000-gallon UST. A copy of the above-mentioned ***No Further Action letter*** is attached in the Appendix.

In the Site Reconnaissance, two underground tanks were discovered. A 20,000-gallon emergency generator UST was located north of Building 103. A 600-gallon overfill protection UST was located near the entrance of Building 103 and approximately 25' from the 20,000-gallon UST. The 20,000-gallon UST was installed in 1998 and reportedly installed with overfill protection, release monitoring, and electronic controls to manage the environmental conditions associated with the UST. Information from the EDR database search did not list the 20,000-gallon or the 600-gallon USTs. Mr. Kenneth Purvis of MDNR's UST Program was contacted and questioned about all USTs registered at 4300 Goodfellow Boulevard. Mr. Purvis stated that MDNR has no records of any USTs currently registered at the Site's address. Furthermore, the State would not require registering of a 600-gallon overflow tank if petroleum entering the overflow tank were removed "expeditiously".

The MDNR keeps track of current and historical USTs. There was one property, within a one-half mile radius of the Site, listed in the UST database. A review of the UST information revealed that the all of their USTs from the property was closed in place. The following table details this finding.

Facility Name	Facility Address	UST
US Army 102D US ARCOM - AMSA/55/G	4301 Goodfellow Blvd. St. Louis, MO EDR Map ID A12	Two 560-gallons and a 1,000-gallon UST were removed and have adequately met closure requirements with MDNR.

Orphan Listings

Three orphan listings were included with the EDR report. These listings could not be located and therefore their distance to the Site could not be determined by EDR. After MES LLC compared the general location of the orphan listings to the location of the Site, none of the orphaned facilities are considered within the ASTM E 1527-00 search radius.

3.2 HISTORICAL USE AND OWNERSHIP

A review of available records was conducted at the St. Louis City Assessor's Office, the St. Louis City Register of Deeds, the St. Louis Public Library, the on site GSA records, and by reviewing the documents at the Missouri History Museum Library & Research Center.

Based upon these sources, the Site was improved in 1941 when the US Government condemned the property near the Site and the Site itself for construction of the St. Louis Ordinance Plant. Prior to the condemnation, Ms. Irene Lohmann owned the property and the Site appeared to be use as Community Gardens. The Site was used between in the 1940s as an ammunition manufacturing facility. Following the 1970s, the Site was rehabilitated into the modern office complex, which exists today at the Site.

Various historical records have been attached in the Appendix detailing past uses.

4.0 HISTORICAL RESEARCH

4.1 LAND TITLE RECORDS

According to information obtained from the St. Louis City Recorder of Deeds, a research on the records covering the property cannot be made by the Recorder's Office unless each year of the transfer and the Grantee or Grantor is known. No records existed on index files covering the address of the Site or the legal description of the Site. Since all of the Recorder's records are listed by Grantee/Grantor and the transfer year, the Site is not practicably reviewable and could not be investigated at the St. Louis City Recorder's Office.

4.2 PROPERTY TAX FILES

According to information obtained from the St. Louis City Assessor's Office, the United States of America is registered as the current owner of City Block 4350-000-1200. The purchase agreement was researched in the Assessor's Office in City Hall. The United States of America condemned a parcel with 124.9622 acres, located in the Goodfellow Addition, on October 29, 1941 from Irene Lohmann. A description of CB 4350 Goodfellow Avenue was also associated with the Site. No other information was available from the office.

4.3 AERIAL PHOTOGRAPHS

MES LLC reviewed available aerial photographs of the Site and surrounding areas in order to identify historical land use that may have involved hazardous substances and petroleum products. Seven aerials were found, which dated 2000, 1998, 1985, 1981, 1960, and 1937. The City Engineers office

stated they lost their aerials when the County and the City split functions. The City Planning and Urban Design Agency was additionally contacted for their maps. The following are descriptions and interpretations from the aerial photographic reviews.

Date of Aerial Photograph	Comments
1937	No photography was available for interpretation prior to 1937. In 1937 the area is clear of any manufacturing facility and no indication of disposal areas is indicated. A vacant field is seen in the area on the 1937 photography. A copy of the map is **not available** in this report but a link to its reference source is noted below. The source of the map is from the National Archives - Map TQ-13-1364. Information acquired from the USACE. Reference web link http://pirs.mvr.usace.army.mil/fuds/q-t/stlordpl/oe/asr/findings/sec1.htm#sec1
1960	On the 1960 aerial photography there is no apparent evidence of chemical ordnance disposal. However, there are five areas containing numerous igloos near the Site. (Reference Map M-3). The "Projectile Area", located north of the Site, is a group of buildings used for the storage of bullets and production of 105 mm projectiles. Located on the east side of Area No. 1, included a chemical warehouse and several igloos containing explosives, incendiary mix, tracers, and igniters. Area No. 2, located west of Goodfellow Boulevard, contained storage areas for explosives, primers, tracers, and incendiaries. Primer manufacturing and bullet assembly also occurred in this area. Explosive scrap storage and burning and bullet burning occurred at this location in Area No. 3. Located in Area No. 4 were several powder magazines. Area No. 5 contained several bunkers. Flanked by Goodfellow Boulevard, Area No. 4, Area No. 1, and Area No. 5 are located several manufacturing buildings and powder storage areas. Three buildings comprise the Core Plant, which is located on the south end of the Site. The source of the map is from the SURDEX - Map 143-85. Information acquired from the USACE. Reference web link http://pirs.mvr.usace.army.mil/fuds/q-t/stlordpl/oe/asr/findings/aped.htm.
1971	On the 1971 aerial photography most igloo areas are still present. Area No. 5 is active with numerous truck trailers surrounding the middle igloo. It appears that a docking facility has been established on the north side of the warehouse and trailers surround the igloo. The source of the map is from the SURDEX - Map 625-018. Information acquired from the USACE. Reference web link http://pirs.mvr.usace.army.mil/fuds/q-t/stlordpl/oe/asr/findings/aped.htm.

1981	The map shows the Site with a scale of 1" = 200'. Some of the office buildings have been identified by number and the property out line has been added to assist the reader in located the limits of the study area. The Site has large buildings situated on the property and the area appears to be used as an office complex. No railroad or large truck transports appear on the Site, which would indicate heavy industrial uses. Automobiles are scattered across the Site with a heavy concentration in the southeast corner of the property. Solar panels are located between Buildings 102 and 103. The adjacent property to the east of the Site does not have improvements. The adjacent property to the south of the Site shows large buildings, which the area appears to be an industrial area with automobile parking. The area to the west of the Site includes dwelling units, a military vehicle staging area, a vacant lot, automobile parking and a large office type structure. The area to the north of the Site appears to include large industrial buildings with automobile parking. The original aerial can be found at the City of St. Louis Planning and Urban Design Agency - Maps 15G and 16G. A copy of this aerial is included in the Appendix as Figure No.: 05.
1985	The 1985 aerial photography indicates that some changes have taken place. The Projectile Area has had no change. In Areas No. 1 and 3 the igloos have been razed and replaced by a parking lot and open field. Area No. 2 has several igloos remaining. An open field has been created where there were several igloos. Parking lots and open fields have been created in Area No. 4. The igloos in Area No. 5 have decreased by two and a warehouse has been erected. Throughout the site, former igloo areas have been changed to warehousing space, open fields, or parking lots. The source of the map is from the SURDEX - Map 1059-19. Information acquired from the USACE. Reference web link http://pirs.mvr.usace.army.mil/fuds/q-t/stlordpl/oe/asr/findings/aped.htm.
1998	The map shows the Site with no scale. The Site has large buildings situated on the property and the area appears to be used as an office complex. No railroad or large truck transports appear on the Site, which would indicate heavy industrial uses. Fewer automobiles, as compared to the 1981 aerial map, are scattered across the Site. A building north of Building 108A has been removed comparing the 1981 aerial map. This removed structure was known as Building 111 and was originally used for storage. The adjacent property to the east of the Site has been improved and includes a truck terminal with large warehouse type structures. The adjacent property to the south of the Site shows large buildings, which the area appears to be an industrial area with automobile parking. The area to the west of the Site includes dwelling units, a military vehicle staging area, a vacant lot, automobile parking and a large office type structure. The area to the north of the Site appears to include large industrial buildings with automobile parking. The original aerial can be found at the General Services Administration, Building 107, 4300 Goodfellow Boulevard, St. Louis, MO. A copy of this aerial is included in the Appendix as Figure No.: 04.

2000	The map shows the Site with a scale of 1" = 200'. Most of the major structures on the Site have been identified by number and the property out line has been added to assist the reader in located the limits of the study area. The Site has large buildings situated on the property and the area appears to be used as an office complex. No railroad or large truck transports appear on the Site, which would indicate heavy industrial uses. Fewer automobiles, as compared to the 1998 aerial map, are scattered across the Site. The adjacent property to the east of the Site includes a truck terminal with large warehouse type structures. The adjacent property to the south of the Site shows large buildings and the area appears to be industrial with automobile parking. The area to the west of the Site includes dwelling units, a military vehicle staging area, a vacant lot, automobile parking and a large office type structure. The area to the north of the Site appears to include large industrial buildings with automobile parking. The military uses cause some concern of potential recognized environmental conditions. The original aerial can be found at the City of St. Louis Planning and Urban Design Agency - Maps 15G and 16G. A copy of this aerial is included in the Appendix as Figure No.: 03.

4.4 FIRE INSURANCE MAPS

A search for fire insurance maps for the area of the Site was conducted at EDR, Inc. Fire insurance maps known, as Sanborn maps depicting the Site were not available. A copy of the No Coveragereport is available in the Appendix.

4.5 CITY DIRECTORIES

Research regarding the availability of historical city phone directories was conducted at the St. Louis Public Library, St. Louis, Missouri. Records prior to 1912 were not practicably reviewable, and therefore, were not included in this report. The Site encompasses even addresses greater that 4200 Goodfellow Boulevard to Patch Street, which is 4364 Goodfellow Boulevard. Those even addresses between 4200 and 4364 Goodfellow Boulevard are believed to be addressees associated with the Site. The following table depicts the entries from the historical city directory reviews.

YEAR	COMMENTS
1912-1913	**Site** **4300 Goodfellow Blvd.:** No listing. **4242 Goodfellow Blvd.:** Dwelling Unit. Adjoining Goodfellow Blvd. Addresses 4242 - 4751 Block: Dwelling units. Adjoining Edelle Street Addresses No listings. Source: Gould's Red Book - 1912/1913.
1919	**Site** **4300 Goodfellow Blvd.:** No listing. Adjoining Goodfellow Blvd. Addresses 4018 Goodfellow Blvd.: Dwelling unit. 4751 Goodfellow Blvd.: Dwelling unit. Adjoining Edelle Street Addresses

1925	**Site** **4300 Goodfellow Blvd.:** No listing. **4258 Goodfellow Blvd.:** Dairy. Adjoining Goodfellow Blvd. Addresses 4004 - 4042 Goodfellow Blvd.: Dwelling units. 4503 - 4711 Goodfellow Blvd.: Dwelling unit. Adjoining Edelle Street Addresses 5740 - 5760 Edelle St.: Dwelling units. Source: Gould's Red/Blue Book.
1932	**Site** **4300 Goodfellow Blvd.:** No listing. Adjoining Goodfellow Blvd. Addresses 3301 Goodfellow Blvd.: Gasoline station. 3303 Goodfellow Blvd.: Gasoline station. 3724 - 4042 Goodfellow Blvd.: Dwelling units. 4200 Goodfellow Blvd.: Dixie Machine Manufacturing. 4321 - 4826 Goodfellow Blvd.: Dwelling units. Adjoining Edelle Street Addresses 5736 - 5771 Edelle St.: Dwelling units. Source: Gould's St. Louis City Directory.
1936	**Site** **4300 Goodfellow Blvd.:** No listing. **4258 Goodfellow Blvd.:** Community gardens. Adjoining Goodfellow Blvd. Addresses 3301 Goodfellow Blvd.: Gasoline station. 3724 - 4042 Goodfellow Blvd.: Dwelling units. 4200 Goodfellow Blvd.: Dixie Machine Manufacturing. 4213 Goodfellow Blvd.: Dwelling unit. 4257 Goodfellow Blvd.: Used cars. 4754 Goodfellow Blvd.: Gasoline station. Adjoining Edelle Street Addresses 5736 - 5771 Edelle St.: Dwelling units. Source: Gould's St. Louis City Directory.

1940	**Site** **4300 Goodfellow Blvd.:** No listing. **4258 Goodfellow Blvd.:** Community gardens. Adjoining Goodfellow Blvd. Addresses 4200 Goodfellow Blvd.: Dixie Machine Manufacturing. 4257 Goodfellow Blvd.: Used cars. 4734 Goodfellow Blvd.: Dwelling unit. 4754 Goodfellow Blvd.: Gasoline station. Adjoining Edelle Street Addresses 5736 - 5771 Edelle St.: Dwelling units. Source: Gould's St. Louis City Directory.
1946	**Site** **4300 Goodfellow Blvd.: St. Louis Administration Center.** Adjoining Goodfellow Blvd. Addresses 3742 Goodfellow Blvd.: Restaurant. 4008 Goodfellow Blvd.: Restaurant. 4200 Goodfellow Blvd.: Dixie Machine Manufacturing. 4701 Goodfellow Blvd.: Dwelling unit. Adjoining Edelle Street Addresses Street not listed. Source: Gould's St. Louis City Directory.
1951-1956	**Site** **4300 Goodfellow Blvd.: Army & Air Force Motion Picture Service; McQuay Norris Mfg. Co. - Core Division Of St Louis Ordinance Plant; and U.S. Defense Corporation.** Adjoining Goodfellow Blvd. Addresses 3301 Goodfellow Blvd.: Gasoline station. 3303 Goodfellow Blvd.: Gasoline station. 3731 Goodfellow Blvd.: Medical center. 4001 Goodfellow Blvd.: Electrical contractor. 4701 - 4711 Goodfellow Blvd.: Dwelling units. Adjoining Edelle Street Addresses Street not listed. Adjoining Siemers Lane Addresses 4041 Siemers Lane: McQuay Norris Mfg. Co. - Core Division Of St Louis Ordinance Plant. Source: Gould's St. Louis City Directory.

1961-1966	**Site** **4300 Goodfellow Blvd.: Government Training Project, U.S. Army Mobility Equipment Center, U.S. Army Ordinance - St. Louis Division; Olin Mathieson Chemical Co., U.S. Army Defense Corporation; Moving Storage Warehouse; and Gaylord Container Corporation.** Adjoining Goodfellow Blvd. Addresses 3303 Goodfellow Blvd.: Oil products. 3350 - 3524 Goodfellow Blvd.: Offices, distributors, and upholstering. 3723 - 3921 Goodfellow Blvd.: Offices and dwelling units. 4010 Goodfellow Blvd.: Lincoln Engineering. 4111 Goodfellow Blvd.: Loan company. 4200 Goodfellow Blvd.: Farm machinery sales. 4500 Goodfellow Blvd.: Pharmacy. 4575 Goodfellow Blvd.: Explosives manufacturing. Adjoining Edelle Street Addresses No listings. Adjoining Siemers Lane Addresses 4010 Siemers Lane: Construction company. 4014 Siemers Lane: Parking lot. Source: Gould's St. Louis City Directory.
1971-1976	**Site** **4300 Goodfellow Blvd.: USA Troop Support Command.** Adjoining Goodfellow Blvd. Addresses 4001 Goodfellow Blvd.: Contractors. 4010 Goodfellow Blvd.: Lubricating devices manufacturing. 4100 Goodfellow Blvd.: Army and Air Force Exchange Motion Picture Services. 4111 Goodfellow Blvd.: Dental laboratory. 4200 Goodfellow Blvd.: Farm machinery sales. 4470 Goodfellow Blvd.: Pharmaceuticals manufacturing. 4500 Goodfellow Blvd.: Retail drug sales. 4575 Goodfellow Blvd.: Explosive devices manufacturing. Adjoining Edelle Street Addresses No listings. Adjoining Siemers Lane Addresses 4014 Siemers Lane: Parking lot. Source: Gould's St. Louis City Directory.

1990	**Site** **4300 Goodfellow Blvd.: Post Exchange; Credit Union; US Agricultural FSIS; US Army CMCTN Command; US GSA Field Office; and various vendors.** Adjoining Goodfellow Blvd. Addresses 4111 Goodfellow Blvd.: Church. 4200 Goodfellow Blvd.: Lift truck business. 4301 Goodfellow Blvd.: U.S. Army logistics and operations. 4333 Goodfellow Blvd.: Job Corps. 4575 Goodfellow Blvd.: Explosive devices manufacturing. Source: Haines St. Louis City and County Directory.
1999	**Site** **4300 Goodfellow Blvd.: Alpha Industries; Bean Anita; Credit Union; Record Center; Uncle Sam's Kids; US Agricultural FSIS; V.A. Records; US Army AMSA; and US Army various.** Adjoining Goodfellow Blvd. Addresses 4111 Goodfellow Blvd.: Church. 4200 Goodfellow Blvd.: Lift truck business. 4333 Goodfellow Blvd.: Job Corps. Adjoining Planned Industrial Drive Addresses 4232 Planned Industrial Drive: Ryder Logistics Company. 4300 Planned Industrial Drive: Madison Works. 4610 Planned Industrial Drive: Technical Service Company. Source: Haines St. Louis City and County Directory.

4.6 BUILDING DEPARTMENT RECORDS

MES LLC contacted the St. Louis Central Files for building inspection records and permits associated with the Site. The objective of the record review is to determine if there are indications of environmental work historically performed on the Site. The following table lists the records discovered.

DATE	COMMENTS
August 2001	Building Permit - Install three fire dampers for vents.
August 2001	Building Permit - One service for data lines.
August 2001	Building Permit - Install fire alarm.
July 2001	Inspection Record - General inspection for electrical.
December 2000	Inspection Record - General inspection.
September 2000	Occupancy Permit - Daycare.

September 2000	Occupancy Permit - YMCA latchkey daycare.
September 2000	Plumbing Permit - Back flow preventor.
August 2000	Occupancy Permit - Thurgood School occupancy permit
August 2000	Plumbing Permit - Fixtures and rough finish.
May 2000	Inspection Record - General inspection.
May 1992	Occupancy Permit - Uncle Sam's Kids daycare.

The files were available from 1991 through present in the Central Files computer system. There are no other records associated with the Site, which were readily accessible by Central Files. The records did not reveal recognized environmental conditions with the Site.

4.7 ZONING/LAND USE RECORDS

MES LLC reviewed the zoning records at the St. Louis Zoning Administration office. According to the records, the Site is zoned as A and F, which are described as Single Family Residential and Neighborhood Commercial District, respectively. The representative of the Zoning Office stated that leasees of the Federal Government are required to obtain various permits when moving in or modifying facilities. Typical permits required include Occupancy and Construction Permits.

4.8 PRIOR USE INTERVIEWS

Interviews were conducted with various knowledgeable persons familiar with the operation of the Site and of the environmental investigations covering the property on and near the Site. The objective of the interview is to obtain information indicating recognized environmental conditions with the property. The interview with Mr. Michael P. Crocker, the General Service Administrations Property Management Director located on the Site, focused on the GSA's activities at the Site and of prior Government activities at and near the Site. Interviews with environmental regulators focused on the investigations in progress covering the various ammunition plants at the Site and in the vicinity. Summaries of the interviews are included in this section.

Interviewee: Mr. Michael P. Crocker - Property Management Director - General Services Administration

Mr. Schafer interviewed Mr. Michael P. Crocker on December 17, 2001 at the subject Site. Mr. Crocker related the following formation pertaining to the property located at 4300 Goodfellow Boulevard, St. Louis, MO. The interview was conducted prior to and during the Site Reconnaissance between 8:15 AM and 4:00 PM. Follow up questions were electronically submitted to Mr. Crocker and the responses to the inquiries are additionally contained in this section.

Mr. Crocker has worked at the Federal Complex (the Site) between July 5, 1977 and present, except for a period between 1989 and 1996. Therefore, he has a combined experience of over thirteen years. The facility was acquired by the GSA in 1966 and subsequently managed as office buildings. Prior to the GSA management of the property, the property was utilized by the Army to manufacture small caliber ammunition. Seven or eight bunkers, which stored explosives, were removed. To prepare the

property for use as an office complex, approximately three to four feet of topsoil was disturbed for construction of new parking lots and streets. The grading of the Site and bunker demolition occurred in the late 1970s. The building demolition debris was believed to have been removed from the Site. It is unknown whether soil was removed in this construction activity.

The environmental issues noted by Mr. Crocker covered topics he was aware of since he was associated with the Site. Several historical issues were known and included below.

- The two sub-stations on the Site, Building 108A and 108B, previously leaked PCB oils in the 1960s and soil was excavated to remove potential contaminates. PCB containing equipment and light ballast were evaluated and removed from the entire Site. The PCB containing transformers were removed from the Site between 1988 and 1996.

- Deliveries of raw materials to the Site were accomplished by rail and truck transportation prior to the GSA's ownership. He did not recall ever seeing bottom-hopper delivery bins under railroad tracks or at truck unloading areas. The tracks were, for the most part, removed and only short segments can be seen at the Site.

- The Motor Pool was located in Building 115 where fuel was stored in underground tanks containing leaded and unleaded gasoline. The tanks were removed and discovered with no holes and consequently no releases were evident. The Motor Pool later moved to Building 208B.

- At Building 103, "a 20,000-gallon underground diesel tank is currently in use for fuel storage for five emergency generators. The "20,000 gallon diesel tank is located at the North end of Bldg. 103 on the north side of Patch Street. The 600-gallon waste oil reservoir tank is located directly across the street next to the entrance of Building 103 or approximately 25 feet from the main tank. The 600-gallon waste oil reservoir tank was installed to capture fuel in the Generator Room in the event that a day tank leaked or a fuel line ruptured in the Generator Room. When we replaced the previous 8,000-gallon tank with the existing 20,000-gallon tank we had to do some soil remediation and testing was performed in that effort. Our Technical Support Branch (Construction Branch) inspected that project (Project # AMO97450)".

- "The 20,000-gallon underground storage tank may be registered with the Defense Information Systems Agency (DISA), Defense Megacenter, St. Louis, MO." Exact information was not available on Tier II reporting of diesel or whom the tank is registered with. The tank was installed in 1998.

- A weapon shooting range was located in the basement of Building 105, on the east end.

- Tunnels connect the buildings at the Federal Complex and are used as utility corridors. The tunnel was blocked off to the adjacent property to the north, south, and east.

- A 250-gallon aboveground petroleum tank is located near the southeast corner of the GSA Site. The fuel is used to service the scooters, lawnmowers, and small handheld maintenance equipment.

- Building 102D was used as a photographic finishing laboratory.
- No hazardous waste is generated at the Site.
- The US Army Corps of Engineers (USACE) is conducting investigations covering some of the adjacent property under the Formerly Used Defense Sites (FUDS) program.

Interviewee: Mr. Gene Gunn - Director - Environmental Protection Agency Region VII

Mr. Gunn manages a department for the EPA Region VII, which investigates historical environmental facilities. He was interviewed over the telephone on January 7, 2002 and was knowledgeable on the Federal activities at 4300 Goodfellow Boulevard. He stated that the Department of Defense has taken responsibility to investigate a portion of the old ammunition plant at 4300 Goodfellow Boulevard. He believes further work will be required to adequately investigate the property and that EPA will request property owners on each of the Federal parcels to conduct their own Preliminary Assessments. The US Army Corps of Engineers is conducting the required work on the Formerly Used Defense Sites (FUDS). The USACE is working on the property north of the GSA Site and south of I-70. The property is contaminated with PCB wastes. Mr. Gunn's project manager is currently out of the office on an extended leave and referred further questions to the previous Project Manager, Ms. Dianna Bailey.

Interviewee: Ms. Dianna Bailey - Project Manager - Environmental Protection Agency Region VII

Ms. Bailey was EPA's the former Project Manager for the St. Louis Army Ammunition Plant and was interviewed over the telephone on January 7, 2002. She manages environmental clean up projects for the Region VII. She was knowledgeable on the Federal activities at 4300 Goodfellow Boulevard and stated that a Preliminary Assessment was conducted by the EPA and completed in February 2001. The assessment includes the GSA (the Site) property covering over 329 acres. The area the EPA investigated included Plants 1 and 2 and US Cartridge was mentioned as a prior occupant of the 329 acres. The report is titled "St. Louis Ordinance Plant Federal Facility - A Preliminary Assessment Review". She noted that a Potentially Responsible Party (PRP) search is underway. This is a list of potential contributors to the pollution or of present landowners, which is used by the EPA to leverage financing of contaminated property. The property is known as the St. Louis (Ex) Ordinance Plant (SLOP) and was registered under MO8910022465. To obtain a copy of their records, Ms. Bailey stated a Freedom of Information Act Request was required.

Interviewee: Mr. Jim Harris - Project Manager - Missouri Department of Natural Resources

Mr. Harris is the Project Manager for the St. Louis Army Ammunition Plant for the Missouri Department of Natural Resources and was interviewed over the telephone on January 15, 2002.

The St. Louis Army Ammunition Plant (SLAAP), north of the GSA Site, had eight furnaces, which were used for shell heating and forging. The potential contaminates from the furnaces include metals and PAHs. Known contamination at the SLAAP area includes VOCs, PCBs, hydrocarbons, and asbestos. The PCB issues are believed to have originated from oil cutting and movement of metal grinding material through various areas of the property. The St. Louis Ordinance Plant (SLOP) was

part of the SLAAP facility originally and includes the Site, which is owned and operated by the GSA.

The MDNR will take over the regulatory affairs of the Federal facility clean up in this vicinity if EPA-Region VII does not go forward with the National Priority Listing (NPL) hazard ranking process. He is not aware of where EPA is in this process and was not aware of any recent reports by the EPA Region VII office.

4.9 PRIOR GOVERNMENT INVESTIGATIONS, REPORTS, AND OTHER DOCUMENTS

MES LLC found no evidence of prior Phase I environmental investigation reports covering the Site. However, previous investigations, reports, and documents pertaining to the Site were created by the EPA - Region VII and by the various governmental departments to determine the presence of hazardous materials and the likelihood of hazardous waste at the Site. The investigations are covered in this section of this report. The reports are quite lengthy and have been reviewed in their entirety for evidence of recognized environmental conditions. A description of the significant findings from each report along with the documents source and title are in the following table.

Title of Document, Date of Publication, Source:
DERP FUDS Preliminary Assessment; 1991; Department of the Army - Kansas City District Corps of Engineers
Significant Findings
The investigation covered the Contico and the Lincoln-Pentair parcels. These properties are north and south, respectively, of the Site. The property was formerly used as a portion of the ammunition plant. The GSA conveyed 12.065 acres to the parent company of Lincoln Pentair, the McNeil Corporation in 1965. An additional 8.1526 acres were conveyed to the McNeil Corporation in June 1976. A portion of the Lincoln Pentaire property was used to manufacture lubricating equipment for the automobile industry. Petroleum hydrocarbons are noted as the most prevalent wastes from their operations. The Contico property covers 15.852 acres and contains Puro Chemical Corporation where janitorial supplies are produced. This property was previously used by the Department of Defense (DOD) for explosive testing, which included bunkers. All bunkers were reportedly decontaminated to the 5X condition. The site inspection revealed toxic wastes on the Contoco property including 55-gallon drums of toxic wastes in the bunkers. On the Lincoln Pentaire property, an underground storage tank was noted. The tank was reportedly DOD owned and is believed to have been drained. The UST was recommended for removal including cleaning of fuel distribution lines. Soil contaminated was recommended for removal. The Lincoln Pentaire property adjoins the Site to the south. Fourteen PCB containing transformers were in use in 1991 and recommended to remain in place.
Title of Document, Date of Publication, Source:
Ordinance and Explosive Waste, Chemical Warfare Materials, Archives Search Report for St. Louis Ordinance Plant and St. Louis Ordinance Core Plant St. Louis, MI. DERP-FUDS Site Numbers B07MO0010 and B07MO0170; Dated 1993; Department of the Army - Rock Island District Corps of Engineers http://pirs.mvr.usace.army.mil/fuds/q-t/stlordpl/oe/asr/findings/toc.htm
Significant Findings

The Federal Center Complex at 4300 Goodfellow Boulevard, the Site, USACE Site Number B07MO0032, is covered in this Government report. The goal of the investigation "were directed towards determining possible use or disposal of chemical warfare materials on the site and documenting the existence of Ordnance and Explosive Waste (OEW). Particular emphasis was placed on establishing the chemical (agent), the type of munitions or container, quantities and area of disposal. Information obtained during this process was used in developing recommendations for further actions at the site." Map M-3 shows the areas where there is a greater potential for contamination and is found in the Appendix. These areas include bullet burning, a chemical warehouse, an incendiary mix area, and explosive storage areas. Contamination is known north of the Site and west of the Site in areas controlled by DOD. Heavy metals on the interior of buildings, heavy metals in the aqueous discharge for the sewer system and explosive residues were detected on adjoining property. United States Cartridge operated Plant #1 and #2. Map M-3 shows that powder storage areas were previously located south of Buildings 102, 103, 104, and 105 on the Site. Conversations with GSA officials revealed that an underground tunnel system exists at the plant and that casings were reportedly discovered in these tunnels.

The Ordnance Plant was operated during WWII, the Korean War, and the Vietnam War. During WWII the plant was used primarily for manufacturing, testing, and storing of .30 and .50 cal ammunition. During the Korean War, much of the plant manufactured 105mm shells. The St. Louis Army Ammunition Plant, 21 acres, is all that remains of the original Ordnance Plant. The General Services

Administration owns most of the area (approximately 68 acres), known as the Federal Center, and uses the original production buildings as office space. The bunkers have been removed and the underground tunnels have been blocked at the boundaries of GSA property. A powder storage bunker south of Building 211 was noted as remaining in place. This appears to be immediately north of Building 108 B and north of the GSA Site. The USACE of Huntsville office recommended no further action on the Formerly Used Defense Site. As a result of the study, it was further recommended that Huntsville notify the DOD of potential ordnance contamination at the DOD facility.

Title of Document, Date of Publication, Source:

The Site Investigation (SI) Review for the former St Louis Ordinance Plant (SLOP); February 27, 2001; United States Environmental Protection Agency - Region VII

Significant Findings

The SI was not available at the writing of this report. However, interviews with EPA representatives revealed the SI recommends further environmental investigatory work and suggested that a PRP search be conducted. The EPA is recommending that the Federal property owners investigate the parcels under their control. A copy of the report will be furnished directly to the GSA Kansas City Office, which is the recipient of this ESA.

Title of Document, Date of Publication, Source:

Environmental Assessment Summary; Unknown; General Services Administration

Significant Findings

The summary is a review of earlier environmental reports including Installation Assessment of St. Louis Army Ammunition Plant, Report No. 153 (US Army Toxic and Hazardous Materials Agency, December 1979); Survey of Hazardous/Chemical Area No. 2 of the Former St. Louis Ordnance Plant, Final Report (Report DRXTH-FS-TR-8ll05, Volumes I and II. US Army Toxic and Hazardous Materials Agency, June 1981); Update of the Initial Installation Assessment of St. Louis Army Ammunition Plant, Final Report (Environmental Science and Engineering, Inc., July 1987); and Archives Search Report, St. Louis Ordnance Plant and St. Louis Ordnance Core Plant, Draft Report (Defense Environmental Restoration Program for Formerly Used Defense Sites, Ordnance and Explosive Waste Chemical Warfare Materials, US Army Corps of Engineers, Huntsville Division, December 1993). Residuals of heavy metals and/or explosives were discovered in adjacent buildings near the Site, which were parts of SLAAP. Small spills of fuel oil were discovered at SLAAP, north of the Site. The report titled Installation Assessment of St. Louis Army Ammunition Plant, Report No. 153 specifically stated that their "records search revealed no indications of contamination from past operations at SLAPP". However, significant volumes of thinner, enamel, primer, petroleum products, and phosphoric acid were consumed each month in the 105-mm production process. The waste streams hauled off included oils and flammable liquids. The only other discharge listed was via the combined sewer, which was owned by St. Louis Metropolitan Sewer District.
Title of Document, Date of Publication, Source:
Drawing M-1; December 30, 1993; United States Army Corps of Engineers
Significant Findings
The map is a plan view showing the boundaries in 1991 of Plant 1, Plant 2, U.S. Army Reserve Center, Wherry Housing, Hazardous/Chemical Area #2, Core Plant, and the Chevrolet Shell Division of General Motors Corporation. The GSA Site is within the 122-acre Plant I boundaries.

4.10 LOCAL PUBLIC MUSEUM

Considerable historic information was discovered at the Missouri History Museum Library and Research Center in St. Louis, MO. The significant documents covered in this section have been included in this report as attachments to the Appendix. The title of the document, date of publication, source, and a summary of the significant findings are included in the following table. Processes, environmental conditions, and the uses or re-use of material were identified in these articles and condensed for this section.

Title of Document, Date of Publication, Source:
"Bullets By the Billions"; February 1943; St. Louis Ordinance Plant
Significant Findings
Ground was broken to construct the Ordinance Plant on March 28, 1941 and was called Plant #1. A second plant was conceived prior to the construction of Plant #1 and Plant #2 was added. These plants were managed by Western Cartridge Company, which was later incorporated into the United States Cartridge Company. The McQuay-Norris Manufacturing Company managed the operation of the armor piercing core plant, which was located within the St. Louis Ordinance Plant and south of the Site.
Title of Document, Date of Publication, Source:
"The Life History of a Cartridge"; no date; United States Cartridge News

Significant Findings
This article is the first in a series of articles by ***The News*** designed to inform workers at the St. Louis Ordinance Plant the steps in ammunition fabrication covering the entire manufacturing process and the processes used in the multitude of manufacturing steps. Other articles in the series include Cartridge Cases Grow Up; The Business End Of a Cartridge; The Primer . . . Small But Most Important; Armor Piercing Cores Add a Knockout Punch; The Proof House; A Summary Of Steps in the Process of Making a Cartridge and Interesting Facts Concerning the St. Louis Ordinance Plant. All of these articles are covered herein. The first step to create cartridges, brass is reduced to the proper thickness by a series of rolling operations. The brass was composed of 70% copper and 30% zinc. The material is then cut into squares, which will fit the blank and cut machines. Round disks are "cold worked" and stamped out forming cups, which are then washed and dried. An annealing process is accomplished where heat is subjected to the disks to remove fractures in the material. An acid bath is given to the disks to remove oxide film then they are washed, rinsed, and dried. The disks are then subjected to four draws to form the cartridge case. The draws are essentially cold working where the material is annealed, washed, rinsed, and dried following each step. Trimming takes place after each draw where excess cartridge material (brass) is removed. Huge furnaces were used in the annealing process. No mention was made of a fuel source or how waste is managed in the trimming or washing processes.
Title of Document, Date of Publication, Source:
"Cartridge Cases Grow Up"; no date; United States Cartridge News
Significant Findings
Following the four draws, trimming and lubrication of the cartridge occurs. Several cold forming steps occur then a cutting operation is used near the head of the case or cartridge. More annealing and cold forming occurs then the cartridge is washed as described in ***The*** Life History of a Cartridge. The primer is crimped into place then the cartridge has shellac and varnish applied to make the case moisture-proof.
Title of Document, Date of Publication, Source:
"The Business End Of a Cartridge"; no date; United States Cartridge News
Significant Findings
This article covers the processes used to manufacture the bullet, which is also called the core. The core manufacturing operations were accomplished by McQuay-Norris adjacent, or south, of the Site. Tracer, Armor-Piercing, and Ball bullets were made at the Core Plant. The major components consist of lead, steel, copper, and zinc. The Caliber .50 and Caliber .30 cartridges had lead cores. Similar processes, comparing cartridge manufacturing, were used to make the bullets. Lead is delivered to the Lead Shop in 90-pound cylinders. The lead is pressed in the 40-ton extrusion press to form slender wires. The wires come out of the press and are guided through a trough of water where the wire is wound on reels. Then cutting and further forming is done to form the material into slugs. Scrap called "weep" is created in the extrusion press and the swaging machine. The weep material is re-melted in the Lead Shop to form the cylinders for re-use.
Title of Document, Date of Publication, Source:
"The Primer . . . Small But Most Important"; no date; United States Cartridge News
Significant Findings

This article covers the processes used to manufacture the primer. The primer manufacturing operations were accomplished adjacent, or west, of the Site. The primer building was located west of the present day entrance to the GSA's Federal Complex. A series of forming operations utilizing charging mixtures, alcohol, water, and metal occurs. The charging of the primer cup took place in two inches of water to keep wet the charging mixture not captured in the forming process.
Title of Document, Date of Publication, Source:
"Armor Piercing Cores Add a Knockout Punch"; no date; United States Cartridge News
Significant Findings
This article covers the processes used to manufacture the armor piercing cores. The core manufacturing operations were accomplished by McQuay-Norris adjacent, or south, of the Site. High carbon content steel was cut into bullet cores to create the bullets. Washing and heating processes were used then the heated cores were dropped into a "quenching oil" in a tank thirteen feet below floor level. A centrifuge was used to remove the excess oil then the cores were ground to exact dimensions. Washing again was accomplished to remove impurities. Then the cores are sent to the Packing Department where they are oiled to prevent rust. The processes generated large amounts of steel chips and shavings, which were collected and put in rotary washers to remove oils and "whatever chemical substances which may adhere to the steel". The cleaned steel was then bailed and sent back to the steel mills for reprocessing.
Title of Document, Date of Publication, Source:
"The Proof House"; no date; United States Cartridge News
Significant Findings
Testing on the cartridges, primers, and their components were made in the Proof House, which was located in Building 207. This building was located south of Edelle Street, immediately south of Building 122 on the Site. Firing tests were conducted along with verification that the cartridges had sufficient propellant weights. The cartridges were broken down to weigh the propellants.
Title of Document, Date of Publication, Source:
"Interesting Facts Concerning the St. Louis Ordinance Plant"; no date; United States Cartridge News
Significant Findings
The bullet point list of facts on the plant state that the main facility was nearly 300 acres; there are six miles of railroad track and two diesel locomotives for freight movement; water consumed in a 24-hour period amounts to 6,181,720 gallons; 88 tons of coal are consumed daily; 4,400 gallons of lubricating oil are needed daily; 60 carloads of brass are required each 24-hours; and the Ordinance plant is the largest employer in the St. Louis area with over 42,000 personnel.
Title of Document, Date of Publication, Source:
"A Summary Of Steps in the Process of Making a Cartridge"; no date; United States Cartridge News (note that a copy of the article was not included in the Appendix).
Significant Findings
This document summarizes steps in the manufacturing of cartridges contained in the United States Cartridge News articles. This article does clarify that the propellant used in the Caliber .50 and Caliber .30 ammunition is not manufactured at the Ordinance Plant but is railed to the Tyson Valley plant on Highway 66. The propellant is brought to the Site and stored in magazines where it was used to supply the needs of loading units. Heavy concrete barricades, for safety reasons, surrounded the powder magazines.

Title of Document, Date of Publication, Source:
"Old Small Arms Plant Defies Peacetime Use"; December 15, 1974; St. Louis Post Dispatch
Significant Findings
The newspaper article discusses the potential uses of the property where the small arms plant once was located. A portion of the property was owned by Southern Pacific Railroad, and planned as a truck to rail intermodal facility. The small arms property is not secured and public access appears frequent. The Ruskin Avenue District Police Department operates one bunker type building to store bombs and explosive devices. Other uses of the property include an automobile transport company, Schlueter Manufacturing - a galvanized container manufacturing, and idle property.
Title of Document, Date of Publication, Source:
"St. Louis Ordinance Plant" Article 1 of 3, Article 2 of 3, and Article 3 of 3; February 5, 1992; The Gateway Reporter
Significant Findings
The article revealed that ground was broken to construct the Ordinance Plant on March 28, 1941; the first shipment of ordinance was delivered on December 8, 1941, the day after the Pearl Harbor attack; and ordinance production slowed in 1943, which was soon after the end of WW II.
Title of Document, Date of Publication, Source:
"Federal Facilities Section to Assist in the Investigation of the Former St. Louis Army Ammunition Plant", 1 of 2 and 2 of 2; October, 2001; Protecting Missouri's Natural Resources Missouri department of Natural Resources
Significant Findings
The Ordinance Plant operation over three years and nine months produced over 6.7 billion cartridges. In 1944, a twenty-one acre piece of the St. Louis Ordinance Plant was converted to a 105-mm howitzer shell plant. After WW-II, both plants were shut down. The St. Louis Army Ammunition Plant was reactivated in 1950 to assist with the Korean War. In May 1954, after production of 19 million shells, the plant was again shut down. In 1967, the plant was re-opened and produced 4.5 million howitzers for the Vietnam War. The property may be "contaminated as a result of the production activities that occurred at these sites". There are a number of potential contaminates that agencies will be testing for in soil and groundwater at the plant. "Most of these contaminates are associated with the manufacturing process including solvents, metals, petroleum, and Polychlorinated Biphenyls (PCBs). PCBs were found in the cutting oil that was used when workers were machining the howitzer shells." MDNR stated that they are investigating whether other areas in the 276-acre Ordinance Plant should be investigated in the future.
Title of Document, Date of Publication, Source:
Missouri Department of Natural Resources (MDNR) UST Closure Letter; April 13, 1999; MDNR
Significant Findings
The letter dated April 13, 1999 from MDNR to Mr. Todd Frazier of the GSA in Kansas City, MO stated that the 8,000-gallon diesel and the 550-gallon waste oil underground storage tanks require no additional investigation or remedial action. The EDR Database notes that the Site had a 10,000-gallon UST additionally removed. Mark Schafer contacted MDNR's UST Section and inquired to Mr. Kenneth Purvis. Mr. Purvis manages data on USTs for the State and stated that the 10,000-gallon UST was closed satisfactorily along with the 8,000 and 550-gallon USTs. No further action is required on these three USTs, which were removed.
Title of Document, Date of Publication, Source:

"A Century of Enterprise: St. Louis 1894-1994"; 1943 photograph; Page 82
Significant Findings
This photograph shows personnel working inside the St. Louis Ordinance Plant using a sorting table and an automatic shell inspection machine.
Title of Document, Date of Publication, Source:
"Installation Profile St. Louis AAP"; 9/13/1985; U.S. Army Armament, Munitions and Chemical Command, Rock Island Illinois
Significant Findings
A copy of this brochure is not included in the Appendix and may be found at the Missouri History Museum Library and Research Center in St. Louis, MO The brochure was complied by the Army and covered the mission and history of the St. Louis Army Ammunition Plant. The brochure included a section called Environmental Program. The facility, which is north of the Site, had no air, water, solid waste, or hazardous waste permits listed.

4.11 ON SITE RECORD REVIEW

During the Site Reconnaissance, construction drawings were discovered in Building 107, at the Site. Construction drawings of portions of the Federal Complex were available for review. The available records at the Site, along with the construction drawings and photographs, were investigated for information pertaining to past uses and storage of hazardous materials. Of particular importance were the construction aspects of the facility and whether environmental construction protections were build into the components of the facility. The following table lists the important documents reviewed and observations made from the documents. Most of the documents have been included in the Appendix.

Name of Document and Date	Observations
Current Site Plan Drawing - No Date.	The plan view of the Site shows the boundaries of the property in question, which is generally bounded by Patch Street on the north, Mc Nair Street of the east, Edelle Street on the south, and Goodfellow Boulevard on the west. Significant structures are shown with parking surrounding the structures.
Old Site Plan Drawing - 8/19/1955	This is a copy of a plan titled Entrance Gate Numbers - St. Louis Ordinance Plant, Drawing Number GEN-A-1002, dated 8/19/1955. The drawing shows the building numbers and street names for easy identification and correlation to the existing Site conditions. The Index of Buildings, taken from the Old Site Plan Drawing, also included in the Appendix was taken from the same drawing and should be used with this plan to cross reference names of structures with building numbers. Referencing these two attachments, many recognized environmental conditions are observed. The list of the Building Numbers and their names are included below for ease in reading.
Index of Buildings from Old Site Plan Drawing - 8/19/1955	This is an index of the buildings on the Site and should be cross-referenced with the Old Site Plan Drawing noted above. The information from this Index of Buildings is repeated below for ease of reading. Portions of the Index were not included in the copy seen in the Appendix but information covering building numbers and names are included below. The following list shows the building names and associated building numbers originally at the Ordinance Plant. Building Number Building Name 101 Administration Building 102 A B C .30 Caliber Production D Loading

122 B	Service Building
136 A B E	Storage
137 A	Paint & Lacquer Mix
141 C	Pump Station
208 B	East Primary Sub Station

Building 108 A Foundation Plan Drawing - 5/29/1957	This was a field check diagram to determine actual field conditions of the Primary Substation 108A, which is the South Primary Substation. The plans show an "oil drain pit" with an earth floor. Two cells 15'-6 1/2" (wide) by 9'-0" (long) are centered under the railroad tracks in the transformer room. A 4' drain line (not seen in the attachment) originates from the 33kV transformer room above the finished concrete floor level and routes material to the two cells. The diagram additionally shows a "pit floor", which is located in the switch gear room. It is not clear whether this pit is earth lined or concrete lined.
Photograph of Building 112 South Side - No Date	The original of this photograph, showing the south side of Building 112, is available from Mr. Michael P. Crocker at the GSA Building 107 on the Site. This building was previously called the Lead Shop and is currently the location of the cafeteria and is labeled Building 103F. The photograph shows that the Building is labeled 112 and has railroad tracks running north-south on the east side of the building. Several roof mounted appurtenances, possibly vents are located on the southwest and northeast top of the building. Bare soil is observed between the railroad tracks.
Photograph of Bunker 104 - No Date	The original of this photograph, showing Bunker 104, is available from Mr. Michael P. Crocker at the GSA Building 107 on the Site. The structure was located south of Building 104. The structure is a massive concrete bunker used for powder storage.
Photograph of Building 115 - No Date	The original of this photograph, showing Building 115, is available from Mr. Michael P. Crocker at the GSA Building 107 on the Site. The structure is labeled "105" and "General Services Administration Interagency Motor Pool".
Drawing No.: GEN-M-30003 - 9/22/1942	A copy of this drawing is not included in the Appendix and may be found in Building 107 at the Site. This drawing was titled ***Underground Sewer Distribution System*** and detailed the property at the Site noting the layout of the sewer system. Diameter of pipes and construction material was noted. The sewer system, which appears to be a combined storm and sanitary system, was noted as cast iron pipe to 5'-0" diameter beyond buildings with the balance of the pipe vitrified salt glazed tile pipe. The drawings did not note manhole construction details or references to standards of manhole construction details.
Drawing No.: 112-A-102 - 4/1/42	A copy of this drawing is not included in the Appendix and may be found in Building 107 at the Site. This drawing was titled ***St. Louis Ordinance Plant - Lead Shop 112.*** The drawing reveals that the building had slug-forming machines. Loading docks were located on the northeast and southeast corners of the building. A re-melt room was located on the southwest corner and exhaust fans were located on the west wall near the southwest corner of the building.

Drawing No.: GEN-E-4044 - Field Checked 7/25/1953	A copy of this drawing is not included in the Appendix and may be found in Building 107 at the Site.This drawing was titled ***St. Louis Ordinance Plant 13.2 kV Profile - Buildings 101 to 102, 103, 110, 112 Plant No.: 1*** The drawing show extensive use of transite underground pipe 4 1/2" diameter for electrical carrier pipe. The lines lead to the pull boxes with depth typically 3' to 4'.

4.12 HISTORICAL USE SUMMARY

The following table summarizes the findings of Section 4.0 - Historical Research pertaining to the Site and adjoining properties. In the following table, the businesses listed under the Historical Uses column operated over a portion of the time frame shown under the Period column. The dates listed under Period do not mean the businesses operated the entire Period.

PERIOD	HISTORICAL USES		SOURCE(S)	COMMENTS
	Site	Surrounding Area		
1912 - 1913	Residential District Dwelling Unit.	Residential District Dwelling Units.	Gould's Red Book	A dwelling unit was located at 4242 Goodfellow Boulevard. This was the earliest record identified.
1919 - 1925	Residential District Dairy.	Residential District Dwelling Units.	Gould's Red Book	A dairy is listed at 4258 Goodfellow Boulevard.
1932 - 1940	Residential District Community Gardens.	Residential District Gasoline stations, dwelling units, used cars, and machine manufacturing.	Gould's St. Louis City Directories	The gardens were listed at the Site in 1936. The machine manufacturing business was located immediately south of the Site at 4200 Goodfellow Boulevard.

1941 - Present	Residential and Commercial District St. Louis Ordinance Plant, and the Federal Center.	Residential and Commercial District St. Louis Ordinance Plant, St. Louis Army Ammunition Plant, restaurants, machine manufacturing, dwelling units, gasoline stations, office buildings, oil products, pharmacy, explosives manufacturing, parking lots, lubricating devices, dental laboratory, church, lift truck business, Job Corps, truck distribution center, and the Army Reserve Center.	Haines/Gould's St. Louis City and County Directory; aerial maps from the National Archives; St. Louis Assessor's Office; Missouri History Museum Library and Research Center.	The property at the Site, presently managed by the United States of America - GSA, was developed in 1941. The Government condemned the property in 1941.

5.0 SITE RECONNAISSANCE

The site reconnaissance was performed on December 17-18, 2001. Current use and condition of the property and adjoining nearby properties was noted, as well as information on land use in the vicinity. Visual observations were made from public right-of-ways and the Site to determine if there was evidence of likely environmental conditions. The reconnaissance occurred on a warm and sunny day.

The Site is a large office complex with over twenty-four buildings covering 63.77 acres (Reference Photograph 2 in the Appendix). The structures are primarily WW II era red brick construction, which have been modernized with energy efficient appurtenances and up-to-date amenities. The property is segregated into two areas by a chain-link fence separating the Federal Complex, which is operated by various Federal agencies, and the Thurgood Marshall Academy (reference Photograph 1 in the Appendix). The Federal Complex, Building 208 B, and the Thurgood Marshall Academy together comprise the Site. The school has kindergarten through 8th grades and operates out of Building 101. A security entrance is operated continuously at the entrance of the Federal Complex and no other entrances exist for vehicular traffic.

The property slopes slightly eastward and is bounded on the west by Goodfellow Boulevard, on the north by Patch Street, on the east by Planned Industrial Drive and on the south by Edelle Avenue (reference Photograph 3 in the Appendix), in St. Louis, Missouri. Surface drainage off the site is generally towards the nearby streets into storm drains, where water is then routed easterly. The manholes in the sewer system appear to be typically brick lined (reference Photograph 15). Considerable sediment exists in the various manholes, which were visually inspected. Roof drainage from the structures appears to route flows directly into the City sewer system. Access into the Site is through the west-front entrance where the security gate and security officials screen incoming traffic.

debris, abandoned munitions, or dumping at the Site nor were there signs of stressed vegetation. A 20,000-gallon underground storage tank (UST) fuels emergency generators north of Building 103 (reference Photograph 4). A smaller 600-gallon UST was installed in the same vicinity in order to capture releases from the fuel system. The fueling system was reportedly equipped with release detection, overfill protection, spill protection, and environmental electronic controls to manage the operation of the 20,000-gallon UST.

The substations, 108A and 108B, were inspected (reference Photograph 5, Photograph 6, Photograph 7, and Photograph 8). The substation construction was compared to the construction drawings of the buildings. It was noted that the sumps were not located exactly as detailed in the construction drawings. However, there were sumps in each of the transformer rooms and the switch gear rooms. The construction drawings did show sumps in each room as the inspection of the buildings verified. Liquid, with a floatable material, was observed in the switch gear room sump on Building 108 B (reference Photograph 6). Some liquid and black material was noted inside of the Oil Drain Pit of the transformer room in Building 108 B (reference Photograph 7). Both Buildings 108 A & B had similar construction where a sump was located in the transformer room and the switch gear room. Building 208B was not accessed but is believed to be similar to the 108 A and B Buildings.

An indoor shooting range was located in the basement of Building 105 (reference Photograph 9, Photograph 10, Photograph 11, and Photograph 12). The receiving bins for the bullets were filled with sand and debris. No information was available noting cleaning of the range or bins. Sand and debris from the shooting gallery was located on the floor inside and outside of the confines of the structure. Water stained wood appeared on the shooting galleries base.

Natural gas is used throughout the facility for heating. The main valves and controls on the incoming lines were observed on the southeast corner of the Site (reference Photograph 14). The pipeline and controls were inside of the Site's chain link fence but otherwise unprotected. The natural gas distribution lines are painted yellow and can be observed on top of most of the buildings at the Site (reference Photograph 16).

Maintenance was occurring inside of Building 122 (reference Photograph 19). Hazardous materials were stored adequately and appeared properly managed. A tunnel system linked the buildings at the Site was used as a utility corridor. The use of the lines, historically speaking, was not ascertainable. However, the tunnels were reportedly blocked at the property lines as they did traverse north into adjoining SLAAP areas. Several vents were observed at the Site to allow circulation into the tunnel system (reference Photograph 20).

The adjoining property includes:

North:	St. Louis Ordinance Plant - non-GSA controlled (reference Photograph 23 in the Appendix).
East:	Truck Distribution Center (reference Photograph 21 and Photograph 22 in the Appendix).
	Lincoln Engineering (reference Photograph 24 in the Appendix).
South:	Old Ordinance Proof House (reference Photograph 25 in the Appendix).
	Fork Truck Business (reference Photograph 26 in the Appendix).
West:	Hazardous/Chemical Area No.: 2 Clean-up area (reference Photograph 27 in the Appendix).

U.S. Army Reserve Center (reference Photograph 28 in the Appendix).

No other relevant observations were made during the site visit regarding current or past uses of the Site or adjoining property in the vicinity. Copies of photographs, taken during the December 17-18, 2001 Site reconnaissance, have been included in the Appendix under Current Photographs and represent the condition of the Site on that day.

6.0 FINDINGS

The following are the findings for the Phase I Environmental Site Assessment (ESA) that was conducted by MES LLC for General Services Administration on the subject Site:

Site Description - The assessment site consists of an irregular shaped parcel covering 63.77 acres known as the Federal Complex at 4300 Goodfellow Boulevard, St. Louis, MO. The legal description is described as City Block 4350-000-1200 in the Goodfellow Addition. The Site was previously used as a portion of the St. Louis Ordinance Plant and constructed in the early 1940s primarily to fabricate Caliber .30 and Caliber .50 ammunition. This ammunition plant was the largest small caliber plant of it's kind in the world during the peak operations. Little evidence remains at the Site suggesting the earlier uses to fabricate the munitions. Much of the area was graded to accommodate the large automobile parking areas and streets currently used at the Site and some structures such as the Powder Storage buildings were removed. The Site is zoned as A (single family residential) and F (Neighborhood Commercial District) as governed by the Zoning District of St. Louis, MO. The Site is located in Township 46 North, Range 7 East, St. Louis City, Missouri.

Records Review – The EDR database shows that the Site is listed twice under CERCLIS; has two RCRA Small Quantity Generator Numbers, and had three USTs removed between 1989 and 1999. The USTs removed had 8,000-gallon, 10,000-gallon, and 550-gallon volumes. Correspondence from MDNR verified that the 8,000-gallon and the 550-gallon USTs were granted a No Further Action (NFA) status. No records were discovered showing the NFA status was granted concerning the 10,000-gallon UST removal. Two USTs were discovered near Building 103 during Site Reconnaissance. These USTs had volumes of 20,000-gallons and 600-gallons. Neither of these tanks was listed in the database search. MDNR was contacted and verified they have no registration on any USTs at the 4300 Goodfellow, St. Louis, MO address.

There are four RCRIS-SQGs within one-quarter mile of the Site; seven LUSTs within one-half mile of the Site; and one UST location within one-half mile of the Site. Two of these LUSTs are currently in the active investigation stage but are down-gradient or away from the Site and are not considered potential recognized environmental conditions to the Site. The one property, which had USTs listed, had its USTs removed and had met MDNR's closure requirements. Three orphaned listings were researched and a determination concluded that none of the facilities were within the minimum ASTM E 1527-00 search radius.

Historical Research - The research revealed the Site had addresses associated with dwelling units, a

dairy operation, and Community Gardens from 1912 to 1940 when the following year the Site was acquired by the United States Government. An ordinance plant, which manufactured small caliber ammunition, was built on and around the Site. The construction of the ordinance plant commenced on March 28, 1941. The Site's use dwindled soon after WW II and went through several reactivation phases during the Korean War and the Vietnam War. The facility was acquired by the GSA in 1966 and was subsequently improved and managed as an office building complex. Significant grading was performed in the late 1970s in order to prepare the property for the current Federal Complex.

In 1941, Plant I occupied the area of the Site and this plant produced .30 Caliber and .50 Caliber cartridges. Bullets, primers, propellants, and raw materials were prepared off of the Site and transferred into the Site for ammunition fabrication. The cartridge casings were fabricated on the Site and the bullets (cores), primers, propellants, and other raw materials were incorporated into the ammunition on the Site. Powder Storage or propellants was located at four buildings on the Site where the explosives were brought into the needed buildings on the Site. Slug forming machines were located in Building 112 (now called Building 103F) and a re-melt room was located on the southwest corner of the building. Exhaust fans were located on the west wall near the southwest corner of the building. Lubrication of cartridges occurred in the manufacturing process and cartridges were cleaned in acid baths, lacquered, and shaved of metal. The drain lines from the facility were constructed of cast iron pipe and vitrified salt glazed tile pipe. Manhole details were not available on drawing but Site Reconnaissance revealed brick lined structures.

The use of hazardous materials in the ammunition production included petroleum products, metals, solvents, lacquers, and explosives. The large transformers on Site had releases of oils and required prior clean up of PCB wastes in the 1960s. The Buildings 108 A, 108 B, and 208 B are electrical substations constructed with sumps below the finished floors. Drawings indicated earth lined bottoms on the transformer rooms and did not note floor construction material for the switch gear sumps. The drawing detailed a 4" oil drain line into the earth-lined sumps. Site Reconnaissance revealed liquid inside several of the sumps with dark floatable material on top of the liquid.

PCBs were reportedly used in the cutting oils north of the Site per the MDNR's representative, Mr. Harris. Cutting operations were noted in historical documents and large volumes of materials were shipped off property for recycling. Rail transportation was noted to bring raw material into the Site and photographs revealed track structure with soil exposed between the ties.

EPA Region VII personnel verified that their office completed a February 2001 Site Investigation on the St. Louis Ordinance Plant. Their recommendations include for Federal property owners to conduct their own environmental investigations. A PRP search is underway to identify all responsible parties for this notification. A copy of the report was not available at the writing of this ESA but will be furnished to the Kansas City GSA office by EPA Region VII's office.

An indoor shooting range was reportedly in one of the buildings on the Site per historical investigations. The Site Reconnaissance and an interview with Mr. Crocker verified that the range was in the basement of Building 105. This topic is covered in greater detail in this section under **Site Reconnaissance.**

Buildings 102, 103, 104, and 105 were used for the production of .30 Caliber and .50 Caliber ammunition. Uses of the structures appeared similar and were labeled Loading, Primer Insert, Powder Canning, Powder Storage, and Solvent & Lacquer Storage. Buildings 108 A, 108 B, and 208 B were

electrical substations and were constructed with similar designs. The Lead Shop was labeled Building 112 (now labeled Building 103 F) and used to melt lead slugs in a recycling process. Buildings 122 B; 136 (A, B, C); 137 A; and 141 C; were labeled Service Building, Storage Buildings, Paint & Lacquer, and Pump Station; respectively. Transite carrier pipes containing electrical lines exist 3' to 5' deep connecting most buildings on the Site. The electrical lines terminate in pull boxes.

The adjoining property included various uses including idle Federal property, Lincoln Engineering, a truck distribution center, U.S. Army Reserve Center, and a fork truck shop. Historical sources note that the adjoining property was previously part of the Site and includes other ammunition manufacturing operations. Plant 1 encompassed 122 acres where the Site is 63.77 acres. Other adjoining ammunition properties include the Core Plant (south of the Site), Plant 1 property (east of Site), Plant 2 (north of Site), Chevrolet Shell Division (north of Plant 2), and Primer Manufacturing (west of Site). Aerial photographs revealed that a chemical warehouse, bullet burning, and explosive storage existed near the Site. The USACE is investigating several adjacent properties to the Site under the FUDS program. Several investigations were made into these associated ammunition production facilities to the north, south, and west. Contamination was discovered in these areas. Contaminates include petroleum hydrocarbons, solvents, PCBs, PAHs, VOCs, explosives, and metals. The area east of the Site has been purchased and is currently operated as a truck distribution facility.

Dixie Manufacturing was located at 4200 Goodfellow between, 1932 and 1946, which was immediately south of Building 101 and west of Building 110. From 1961 through 1966, a farm sale business operated at the address. From 1990 through the present day, a fork-truck business operated at 4200 Goodfellow.

Site Reconnaissance - The Site reconnaissance was conducted on December 17-18, 2001. The temperature was warm and clear with no snow cover. The area at the Site revealed a modern office complex and is approximately 1,500' (wide) X 2,000' (long) and has twenty-four buildings. Four of the structures are quite large with several structures having lengths over 1,100'. The present use of the Site includes office buildings, a public school, automobile parking, a cafeteria, a recreation facility, support buildings, a maintenance building, a child care facility, a health clinic, a training and auditorium building, and three electrical substations.

Hazardous materials were found inside some of the structures at the Site and were properly contained. There were no signs of hazardous material releases at the Site or were there signs of stressed vegetation. The Site was secured by a chain link fence and had continuous security at the entrance. Within the structures, evidence of hazardous material usage or storage-included lubricants, paints, boiler and air conditioning chemicals, laboratory chemicals, and small amounts of chemicals normally associated with mechanical maintenance and repair. Building 141 C used for hazardous material storage, had its material secured in a locked building and had a concrete floor. Buildings 104 and 105 were mostly vacated and had been used in the past for office spaces. The majority of the buildings on the Site were office buildings.

Building 105's basement had a shooting range with eight shooting galleries. The receiving bins were inspected visually and discovered with sand and debris. The rear of the receiving bins were in severe disrepair with apparent structural integrity failures of the receiving system. Sand was observed on the floor behind the receiving bins and outside of the bins on the floor. Water damage to the base of the wood structure holding the receiving bins was observed. Water had collected in lower areas of the

basement and it appeared elevations of groundwater in the basement had fluctuated.

Buildings 108 A and 108 B were inspected. Large transformers were located in the Transformer Rooms with sumps below the finished concrete floors. The sumps typically had liquids in them with floatable dark material. A gravel bottom could be observed in the Transformer Rooms. A 4" drain line appeared near the transformers, which was retired in place using concrete fill material. The 4" line was cut flush with the floor surface. The Switch Gear Rooms additionally had sumps with liquids in the bottoms of the sumps. Floatable material was observed on the liquids.

Manholes were visually inspected at various locations on the Site and discovered to be constructed all with red brick. Excessive sediment was observed in the bottoms of the manholes and influent and effluent lines were observed allowing flow to proceed partially obstructed.

One aboveground 250-gallon gasoline storage tank was observed near the southeast corner of the Site. The tank was surrounded by a fence and had a locked gate. Lighting was installed over the fuel system for additional security and operational concerns. The tank was installed with a top mounted pump reducing release exposure. No stressed vegetation or evidence of releases was observed. Near the 250-gallon AST, there was a natural gas control and valve station. The pipeline, valves, and controls were not adequately protected from impact or other means of failure.

A 20,000-gallon UST and a 600-gallon UST existed north of Building 103 as evidenced by vent pipes and fill ports. The system was reportedly installed with modern environmental controls.

A tunnel system exists between buildings at the Site and was and is used as a utility corridor. It was not determined, at the Site, the past or current uses of each carrier pipe constructed in the tunnel system. Several of the tunnels were inspected and ingress and egress is difficult due to clearances, obstructions, and ground water issues.

The adjoining properties included idle Federal property, Lincoln Engineering, a truck distribution center, Job Corps, U.S. Army Reserve Center, and a fork truck shop.

7.0 OPINIONS

Site Description - Information from the General Services Administration and the St. Louis County Assessor's Office note that the property consists of an irregular shaped parcel approximately 1,500' (wide) X 2,000' (long) described as City Block 4350-000-1200 in the Goodfellow Addition. The map of the Site, obtained by the General Services Administration (reference Current Site Plan in the Appendix), shows the property at the Site is located east of Goodfellow Boulevard, south of Patch Street, west of Planned Industrial Drive, and north of Edelle Avenue, in St. Louis, Missouri. There is one building managed by the GSA, which is separated from the property Site, Building 215 B, which is north of Building 108 B and is considered part of this assessment. The property at the Site encompasses approximately 63.77 acres.

DeLorme's Street Atlas and the Site Reconnaissance were used to determine addresses associated with the Site, since the frontage to Goodfellow Boulevard was nearly 2,000' long. It was determined that even addresses greater than 4200 Goodfellow Boulevard and up to 4364 Goodfellow Boulevard would have been located on the Site. This information was used in interpreting the City Directories and is

covered in Section 4.5 City Directories in this report. Therefore, operations and residences with even addresses greater than 4200 and up to 4364 are believed to have been previously located on the Site, where the Federal Complex currently is located. This information was used to identify prior uses of the Site.

Records Review - The EDR database shows that the Site is listed twice under CERCLIS. The United States Environmental Protection Agency - Region VII was contacted on several instances concerning their investigations to the Site. The EPA representatives stated that the report titled ***St. Louis Ordinance Plant Federal Facility - A Preliminary Assessment Review*** was completed in February 2001. A copy of the report was requested by Marc Enviro Services LLC and redirected to the GSA Kansas City office per the request of the GSA Kansas City office. A copy of the report was not available at the writing of this Phase I Environmental Assessment. However, based on conversations with Ms. Diana Bailey and Mr. Gene Gunn of the EPA Region VII office, the report covers the area of the Site and adjoining properties, which were used in the manufacturing of ordinance. The EPA report reportedly reviewed work performed by the USACE in its FUDS investigation near the Site and EPA made recommendations for environmental investigations, including environmental sampling, on the area of the Site. Contamination concerns relative to the FUDS investigation related to solvents, PCBs, explosives, PAHs, VOCs, metals, and petroleum products. The EPA is conducting a Potentially Responsible Party (PRP) search. This would be conducted when the EPA believes contamination has or most likely has occurred and anticipates cost recovery actions. It appears that the Region VII EPA office will request the GSA office in the near future to investigate the Site. The previous uses at the Site, which triggered the EPA investigation, are considered recognized environmental conditions to the Site. This issue is covered in greater detail in the **Historical Research** of Section **7.0 OPINIONS.**

The second listing in the CERCLIS database pertains to the United States Forest Service operations in Building 105 D. This inquiry is common to Federal operations, which had an EPA ID Generator Number or completed certain forms in the past. The Discovery was conducted on June 30, 1987 and subsequent follow up actions did not occur. No further activity followed the Discovery and the inquiry was not progressed. This is not considered a recognized environmental condition to the Site.

The Site has two RCRIS Small Quantity Generator Numbers. Identification Number MO6123790002 is owned by the USDA Forest Service Midwestern Laboratory. The number is needed for the laboratories ongoing operations. The facility was observed in the Site Reconnaissance and appeared well managed. There have been eight low-level violations associated with the number between 1985 and 1999. The violations were of the low-level priority and were not related to releases or potential releases. Therefore, the RCRIS-SQG Identification Number MO6123790002 is not considered a recognized environmental condition to the Site.

The second RCRIS Small Quantity Generator Number MO2210090088 was associated with past operations of the GSA. The number MO2210090088 was investigated and appeared no longer being used. This number would have been associated with the disposal of small volumes of hazardous waste. There were no violations associated with this number. The Small Quantity Generator Number MO2210090088 would not be considered a recognized environmental condition to the Site.

There were four RCRIS Small Quantity Generators of hazardous waste within 0.25-miles of the Site. Only one of the generators of hazardous waste had violations where EPA cited incorrect management of their waste. The violations were of the low-level priority and were not related to releases or potential releases. Therefore, the RCRIS-SQGs are not considered recognized environmental

conditions to the Site.

The Site was not listed in the EDR Database Report as a LUST. Conversations with MDNR's representatives did not reveal LUST listings. Therefore, it is believed that there are no LUST(s) pertaining to the Site.

There are seven LUST facilities within one-half mile of the Site, listed in the LUST database. The ground water flow is believed to be radial away from the Site due to the Site's location near a topographical high point. This ground water flow would be consistent with the down-gradient surface contours observed in Figure No.: 01. Of the seven LUSTs listed in the database, five are listed as No Further Action required or clean up status was achieved. Morris Auto Repair and Safi AMOCO are listed as active LUST projects, both of which are over 2,000' away from the Site and down-gradient from the Site. The Morris Auto Repair and Safi AMOCO LUST are not considered to be recognized environmental conditions to the Site due to their distance and down-gradient locations.

The Site previously had three USTs with volumes of 10,000-gallons, 8,000-gallons, and 550-gallons. Based on records received from MDNR, it was clear that the 8,000-gallon and the 550-gallon USTs were removed and were classified by MDNR as requiring No Further Action. Conversations with Mr. Kenneth Purvis of MDNR revealed that the State has no outstanding issues with the 10,000-gallon tank and they show the tank was removed. Furthermore, records furnished to Marc Enviro Services LLC from Mr. Crocker of the GSA showed a contractor removed the 10,000-gallon UST in 1989. Per conversations with Mr. Crocker, the 10,000-gallon UST had no releases and sampling verifying a clean closure was conducted. The three USTs removed from the Site are not considered recognized environmental conditions to the Site.

Two USTs were in operation at the Site and verified in the Site Reconnaissance. A 20,000-gallon emergency generator underground storage diesel tank and a 600-gallon over flow underground storage tank were located north of Building 103, on the north side of the Site. Electronic monitoring of the 20,000-gallon UST appeared sufficiently designed to mitigate risks associated with the bulk fuel storage. The 600-gallon UST was installed to add a release protection tank to collect loss of petroleum from the distribution system. The 20,000-gallon and the 600-gallon USTs appear designed to current standards and would therefore not be recognized environmental conditions to the Site. It was noted, however, that the 20,000-gallon UST was not listed by MDNR in the State's UST database. This should be corrected with the State. The 600-gallon UST would not require registration as long as any petroleum material entering the tank were removed "expeditiously". Petroleum storage in the volume required for the emergency generator tank would require periodic Tier II reporting. This would comply with the Federal laws and furnish Missouri's Local Emergency Planning Commission and State Emergency Planning Commission adequate records. Periodic maintenance of the controls and testing of the 20,000-gallon's environmental control system and containment is important to protect the integrity of the fuel system.

There was one-UST location within one-half mile of the Site. The property, which had three USTs listed, had its USTs removed and had met MDNR's closure requirements. The UST location is not considered a recognized environmental condition to the Site.

The EDR Report listed three orphaned facilities. MES LLC used DeLorme's Street Atlas program to compare the listed orphan addresses to that of the Site. After comparing the general location of the orphan listings to the location of the Site, it appears none of the orphan locations are within the scope

of the ASTM E 1527-00 minimum search radius.

Historical Research - Prior to the United States of America ownership in 1941, Irene Lohmann owned the property. Between 1912 and 1940, the Site appeared to be used for dwelling units, a dairy farm, and Community Gardens. None of these uses would present recognized environmental conditions to the Site.

The property at the Site was operated by the Federal government from 1941 through the present, originally as the St. Louis Ordinance Plant, and later was converted to the office complex it is today. The period between 1941 and 1944 was a heavy production period at the Site when Caliber .30 and Caliber .50 ammunition was fabricated. Use of hazardous materials and the generation of hazardous waste would have been significant based on the volumes of raw materials used and the processes utilized in the manufacturing and reprocessing of materials. An attempt to understand the types of potential contamination based on areas of use at the Site is important when dealing with large areas such as this Site. The historical sources available helped to identify processes and types of hazardous materials used in particular buildings on the Site. This type of investigation is limited, however, at this Site due to the extensive grading and reforming of the surface for parking and other current uses. The following provides observations and opinions of the past St. Louis Ordinance Plant's operations on and near the Site.

Powder Storage - Buildings 102, 103, 104, & 105: The Old Site Plan and the Index of Buildings (Reference the Appendix) show that Building 102, 103, 104, & 105 each had a cache of powder storage south of the buildings. It is believed that this powder was used for the propellants in the Caliber .30 and Caliber .50 production. Based on conversations with the GSA, it appears sampling or environmental investigations were not conducted prior to demolition of the Powder Storage structures. It is unknown whether explosive residues or propellant materials were sufficiently removed from the storage areas prior to building demolition. It appears that grading of the property following removal of the Powder Storage buildings could have contributed to the spreading of residuals over larger areas at the Site. Following the grading of the Site, extensive impervious resurfacing and landscaping was conducted containing, to some extent, potential contaminates. The Powder Storage buildings and their potential for explosive residual contamination to the Site, which have not been quantified environmentally, are considered a recognized environmental condition to the Site.

Ammunition Production and Metals - Buildings 102, 103, 104, & 105: The Old Site Plan and the Index of Buildings (Reference the Appendix) show that Building 102, 103, 104, & 105 were used in the production of Caliber .30 and Caliber .50 ammunition. The series of Cartridge News articles (Reference the Appendix) revealed that cartridges were fabricated using an impact type process where metal wastes, acid bathes, oil lubrication to the cartridges, lubricant cooling in cutting processes, lacquer sealant, solvents, propellants, and primers were used in the manufacturing processes. Metals included lead, copper, zinc, brass, and steel. The metal shavings were removed from the Site and sent off-Site for recycling. Site transportation of oil contaminated metal shavings presents concerns of loss of lubrication from the shavings and metal contamination. Rail and truck transportation was common into the Site. It would have been likely that rail transportation would have been used to transport the heavy metal off-Site for recycling. The railroad tracks were observed in historical photographs at the Site with exposed soil between the railroad ties. It is believed that loss of metal and lubrication would have been likely into the soil on the Site. Evidence that the SLAAP operation (north of the Site) used PCBs in cutting operations for ammunition production was revealed in the article titled ***Federal Facilities Section to Assist in the Investigation of the Former St. Louis Ammunition Plant*** (Reference

the Appendix). PCBs, valued for chemical stability and fire resistance, were manufactured and processed primarily for use as insulating fluids and coolants in electrical equipment and machinery from 1929 through 1977. Use of PCBs in cutting fluids was possible and would add another issue to the movement of metal shavings from the buildings at the Site, into the transportation containers, and across the Site for transportation to recycling facilities off-Site. The movement of oil contaminated metals are a recognized environmental condition to the Site, which may have impacted the Site with metals, petroleum products, and PCBs.

Ammunition Production and Hazardous Material Use - Buildings 102, 103, 104, & 105: The Old Site Plan and the Index of Buildings (Reference the Appendix) show that Building 102, 103, 104, & 105 were used in the production of Caliber .30 and Caliber .50 ammunition. The series of Cartridge News articles (Reference the Appendix) revealed that cartridges were fabricated using processes where metal wastes, acid bathes, oil lubrication to the cartridges, lubricant cooling in cutting processes, lacquer sealant, solvents, propellants, and primers were used in the manufacturing processes. No wastewater treatment facilities were known to exist at the Site. Historical maps discovered at the Site revealed drain lines connected the buildings at the Site, converged into larger diameter pipes, and routed effluent east of the Site. The St. Louis Metropolitan Sewer District verified that the sewer system in the Goodfellow Boulevard area is a combined sewer. This would be an important issue when cleaning drain lines having the potential of containing contaminated sediments. Based on information from the St. Louis Metropolitan Sewer District, routing of storm water from parking lots and roof drains is not an ordinance violation into the local combined sewers. Washing of the cartridges was common at various stages of the production in the ammunition. Wastes would have been directed to the subterranean drainage system and routed off-Site. The drain line system and manholes connecting the drain lines were potential release points of contamination from Buildings 102, 103, 104, & 105. Inspection of manholes, during the Site Reconnaissance, revealed that each was constructed with brick and mortar. Infiltration and exfiltration of drain lines is a common phenomenon in industrial lines and would be likely in lines from the 1940s. Considerable sediment existed in the manholes and could present hazardous characteristics or listed waste due to past operations at the Site. The industrial drain lines with manholes at the Site, along with sediments in the lines, are considered recognized environmental conditions to the Site.

Lead Shop - Building 112: The Old Site Plan and the Index of Buildings (Reference the Appendix) show that Building 112 was labeled as the Lead Shop. Historic photographs and articles revealed slug-forming machines were used to re-melt and form lead into usable components. The flawed components were heated and formed into blocks for re-use at the ordinance plant. Construction drawings showed exhaust outlets on the Building 112's southwest corner. This would have been where lead particles would have likely been released to the outside environment. The area southwest of Building 112 (presently called Building 103 F) would be an area where lead contamination would likely be discovered. Lead is a heavy metal, which settles quite rapidly from the atmospheric environment. Atmospheric conditions could easily allow lead to move away from the Lead Shop but extensive grading on the Site would have disturbed upper surfaces where lead would have accumulated. The Lead Shop and its operations are considered a recognized environmental condition to the Site.

Electrical Sub Stations - Buildings 108 A, 108 B, & 208 B: A drawing was discovered titled Building 108 A - Foundation Plan Drawing - ***Dated 5/29/1957***. The drawing revealed an earth lined sump in the Transformer Room and a second sump in the Switch-Gear Room of Building 108 A. PCB oils were used in the equipment at the Site, which was verified by Mr. Crocker, the manager of the Site. PCB

containing oils were removed, however, in the 1960s. Site Reconnaissance revealed liquid in the sumps in Building 108 A and Building 108 B. Floatable material can be seen in the photographs taken and in one of the photographs, a gravel bottom is observed. The drawing additionally revealed a 4" oil drain line terminating into the "oil drain sump" of Building 108 A. Site Reconnaissance revealed a retired 4" line plugged with concrete. It is believed that PCB oils may have impacted soils in the sumps and that PCB oil may exist in one or more of the sumps. The construction of the Sub Stations 108 A and 108 B are similar and believed to be the same as Building 208 B. Therefore, PCB oils may have impacted the soils in the sumps prior to removal of PCB oils from the equipment in the Sub Stations. The historical uses of PCB oils in the Sub Stations are recognized environmental conditions to the Site.

USDA Midwestern Laboratory - Building 105 D: The operations of the USDA Midwestern Laboratory, while they used hazardous materials and generated small amounts of hazardous waste in Building 105 D, appeared properly managed. Site Reconnaissance revealed no improper management issues or evidence of releases. The floors of the buildings are covered with concrete and soil exposure to contamination appears unlikely in the event any releases did occur. The laboratory issues in Building 105 D are not considered recognized environmental conditions.

Adjoining St. Louis Ordinance Plant (SLOP) and St. Louis Army Ammunition Plant Operations (SLAAP): The adjoining plant operations were more active in production of munitions especially the SLAAP facility. Howitzer and other larger munitions were fabricated north of the Site in the Korean and Vietnam Wars. The Shell Division had a sludge pit and bullet storage area, Plant 2 had a powder storage area, and a Hazardous Chemical Area was west of Goodfellow where contaminated areas have been discovered. The Hazardous Chemical Area had bullet assembly, tracer storage, four explosive storage vaults, primer storage areas, and primer manufacturing. East of the Site (Plant 1 area) had an explosive storage area; incendiary mix storage; a chemical warehouse; chemical bullet burning; an explosive scrap store and burning; tracer and ignition storage; and powder magazine(s). The Core Plant to the south of the Site generated considerable volumes of metal shavings and metal grindings. Lubricants were used in the production processes at the Core Plant. The adjoining areas are contaminated with PCBs, petroleum hydrocarbons, metals, and solvents. PCB oils were suspected in use for cutting fluids north of the Site. The historical munitions fabrications, hazardous material usage, hazardous material storage, and hazardous material disposal operations at the adjoining SLOP and SLAAP facilities are considered recognized environmental conditions to the Site

Adjoining Industrial Facility at 4200 Goodfellow Boulevard: Dixie Manufacturing was located at 4200 Goodfellow between 1932 and 1946, which was immediately south of Building 101 and west of Building 110. From 1961 through 1966, a farm sale business operated at the address. From 1990 through the present day, a fork-truck business operated at 4200 Goodfellow. The industrial activities at the address would likely have used solvents and petroleum hydrocarbons between 1932 through present. The operation may additionally have created metal contaminates from grinding and washing operations. The historical operations at 4200 Goodfellow Boulevard are considered recognized environmental conditions to the Site.

Site Reconnaissance - Observations made on December 17-18, 2001 at the Site revealed small sealed containers of hazardous materials currently used for building maintenance and equipment maintenance. There was no evidence of hazardous material releases at the Site. The concrete floors in the various buildings at the Site are impermeable and act as a barrier to the soil. Releases to the soil or groundwater relative to the small amounts of hazardous materials would be unlikely with proper

management of the hazardous materials. The containerized materials at the Site are not a threat to the Site as long as they are properly stored and maintained. There does not appear to be an impact to the property from the office related hazardous material usage.

Indoor Shooting Range - Basement of Building 105: An indoor shooting range was discovered in the south end of the basement of Building 105 (Reference Photograph 5, 6, 7, & 8 in the Appendix). Eight receiving bins were observed and debris and sand remained inside of the receiving bins. Sand was observed on the floor behind the bins and outside of the shooting gallery structure on the floor. Water damage to the wood structure of the shooting gallery's bins was evident. High water level marks appeared on the base shooting structure. No clean up of the receiving bins was known by Site personnel. The Site Reconnaissance suggested that a clean up of the lead and debris was not conducted prior to abandonment of the shooting range. It is believed that the sand may be contaminated with lead debris from past operations. In the event clean up of the gallery, receiving bins, and gallery debris was not previously accomplished, lead contaminated dust and debris may be spread over much of the basement area due to tracking by personnel and water movement over the basement floor. The indoor shooting range is a recognized environmental condition to the Site.

Natural Gas Valves & Controls: An aboveground natural gas valve and control appurtenance was observed during the Site Reconnaissance (Reference Photograph 14 in the Appendix). The natural gas controls are located on the southeast corner of the Site. This appears to be the Site's primary natural gas supply line. The natural gas appurtenance was unprotected near the Site's southwest corner chain link fence. Vehicular traffic collision or purposeful breaching of the natural gas station is a risk to the Site. The natural gas controls and valves, however, are not a recognized environmental condition to the Site.

250-gallon Above Ground Storage Tank: An aboveground 250-gallon gasoline tank was located on the southeast corner of the Site and was observed during the Site Reconnaissance (Reference Photograph 13 in the Appendix). The tank system was installed with a top mounted pump eliminating potential releases or gravity line failures. The tank was enclosed with a locked gate, had ample lighting, and appeared adequately managed. There were no signs of stressed vegetation near the AST. The 250-gallon AST is not a recognized environmental condition to the Site.

20,000-gallon and 600-gallon USTs: The two underground storage tanks at the Site include a 20,000-gallon diesel tank and a 600-gallon overflow protection tank. The tanks were installed in 1998 and appear to have state of the art environmental protections built into the containment system. Records were not observed showing maintenance of the fuel system, testing of the system, or registration of the 20,000-gallon tank with MDNR. The EDR Database did not list the 20,000-gallon tank and conversations with MDNR revealed that they have no USTs listed at 4300 Goodfellow Boulevard. Tier II reporting would be periodically required for the diesel storage. Based on the age and modern appurtenances associated with the 20,000-gallon fuel UST, it is not considered an environmental concern to the Site. However, USTs, which are not tested to ensure integrity is sufficient and periodically maintained to the manufacturers standards would eventually become a concern. Therefore, the 20,000-gallon UST is not presently a recognized environmental concern to the Site but should be monitored by GSA to ensure the owner of the UST has an ongoing maintenance plan for the tank.

Tunnel System: Tunnels connect the major buildings on the Site. The tunnel system previously traversed north, east, and south to other SLAAP and SLOP areas. The tunnels were used as a utility

conduit for various carrier pipelines. At the time of the Site Reconnaissance and following a review of significant Site drawings, the historical use of each and every line could not be determined. The vast system of tunnels and the associated utility pipes in each tunnel is a concern. Whether the lines carried petroleum or possibly PCB containing oils at earlier periods is unknown. An inventory of all currently unused utility pipes should be conducted to ensure they are fully investigated verifying that contents are known. It is assumed that some of the lines are not presently used but remain in place. The access through the tunnels, in some locations, is not meant for continuous occupancy and egress would be a problem if emergencies developed. Some of the tunnel system is considered confined space and any work in this area should be evaluated under GSA's Confined Space Program.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusions - We have performed a Phase I Environmental Sire Assessment in conformance with the scope and limitations of ASTM Practice E 1527-00 of 4300 Goodfellow Boulevard, St. Louis, MO 63120, the property. There have been no exceptions to, or deletions from, this practice. This assessment has revealed no evidence of recognized environmental conditions in connection with the property except for the following:

- The historical SLOP operations on the Site have been investigated by EPA Region VII and a request by EPA will be made in the near future for the GSA to environmentally investigate contamination at the Site. The SLOP facility used considerable volumes of hazardous materials between 1941 and 1944 to fabricate Caliber .30 and Caliber .50 ammunition. Processing issues associated with the manufacturing of the ammunition at the Site include copper, lead, steel, zinc, brass, solvents, acid baths, oil lubrication of cartridges, lubricant cooling in cutting processes, petroleum hydrocarbons, PCBs, lacquer sealant, bullets, primers, and propellants. Solid waste generated included waste oil, metal shavings, wastewater, lead dust, weep (lead waste), any of the aforementioned non-specification raw materials, and flawed ammunition. This historical usage of the Site has not been fully investigated to determine if contamination occurred and to what extent it may have occurred.

- Powder Storage was located south of Buildings 102, 103, 104, & 105. These propellant storage buildings were removed in the late 1970s during a major renovation of the property where parking lots and streets were constructed. Approximately 3' to 4' of soil was disturbed in some locations. No off Site disposal of soil was discovered. The buildings were reportedly disposed of off-Site. Evidence that sampling and environmental investigations were conducted prior to demolition of the Powder Storage structures was not found. It is unknown whether explosive residues or propellant materials may have existed in the storage areas prior to building demolition. It is unknown whether grading of the property following removal of the Powder Storage buildings might have contributed to the spreading of explosive residuals over larger areas at the Site.

- The movement of metal shavings from the buildings at the Site, into the transportation containers, and across the Site for transportation to recycling facilities off-Site occurred. The metal shavings were suspected of being contaminated with lubricating oils and possible PCB containing oils. Railroad tracks had exposed soil between the ties causing a potential for

releases into the Site. Potential contaminates include PCBs, petroleum hydrocarbons, and metals.

- Many processes occurred in the ammunition production, which would generate wastewater. Considerable washing of cartridges, cleaning of equipment, and cleaning of the facilities generated waste waters with the potential to carry copper, lead, steel, zinc, brass, solvents, acid bath waters, oil lubrication for cartridges, lubricants used in cutting processes, petroleum hydrocarbons, PCBs, lacquer, and explosive residuals into the combined sewer system. The sewer system was constructed in the 1940s and included brick lined manholes. Considerable risks existed for infiltration and ex-filtration through the drain lines and manholes in the sewer system. Sediments were observed in the manholes at the Site. Sediments in the sewer system, soil near the drainage system, and potentially groundwater could be contaminated. Sediment in the sewer system, if cleaned, could be impacted with hazardous characteristics or be classified as listed waste due to past operations at the Site.

- The Lead Shop Building 112 (presently labeled Building 103 F) was used to smelt previously used or discarded lead in order to recycle the material. The blocks of lead were then reused in the bullet production processes. Exhaust outlets existed on the buildings southwest corner.

- The electrical Sub Stations Buildings 108 A, 108 B, and 208 B were used for transformers and switchgear. PCB oils were used prior to the 1960s in the electrical equipment on the Site. The buildings have sumps, some which were verified to be earth lined. Liquid and floatable materials were observed in the sumps in Building 108 A. Evidence from drawings show the 4" oil drain line terminated in the Transformer Room sumps, which had earth floors. All of the Sub Stations are constructed with a similar design.

- The adjoining SLOP and SLAAP facilities were more active in production of munitions than the Site. Based on historical sources, the adjoining facilities had a greater potential to create recognized environmental conditions, as compared to the Site, because the adjoining SLOP and SLAAP facilities treated hazardous waste by destroying munitions components, stored large volumes of hazardous materials, processed explosives into ammunition components, operated ammunition production facilities over a longer period, operated large production facilities that surrounded the Site, and processed large volumes of hazardous materials. The types of hazardous materials used included copper, lead, steel, zinc, brass, solvents, acid baths, oil lubrication for cartridges, lubricant cooling for cutting processes, petroleum hydrocarbons, PCBs, PAHs, VOCs, lacquer sealant, bullets, primers, and propellants. The adjoining SLOP and SLAAP facilities are sufficiently close to the Site where localized subsurface barriers may greatly impact groundwater direction. Information is not available on localized groundwater direction in the vicinity of the Site and would be required in order to determine how adjoining properties may have impacted the Site.

- The historical operations at the adjoining industrial facility located at 4200 Goodfellow Boulevard included a manufacturing facility, farm sales, and a fork truck business. The operations, which started in 1932, are suspected of utilizing metals, solvents, and petroleum hydrocarbons. Groundwater is suspected to flow down-gradient to the east or toward Building 110 on the Site.

- The Indoor Shooting Range, in the south end of Building 105's basement, was observed with debris and sand remained inside of the receiving bins for the eight bays. Sand was observed on the floor behind the bins and outside of the shooting gallery structure on the floor. High water level marks appeared on the base of the shooting structure. A clean up of the lead and debris was not conducted prior to abandonment of the shooting range. Fluctuating water levels may have spread the lead dust. Lead contamination may be present on components of the gallery, receiving bins, gallery debris, and the basement floor.

- The natural gas valves and controls located on the southeast corner of the Site are unprotected near the Site's southwest corner chain link fence. A vehicular collision or purposeful breaching of the natural gas station is a risk to the Site.

- The 20,000-gallon and 600-gallon underground storage tanks at the Site were installed in 1998 and appear to have state of the art environmental protections built into the containment system. Records were not observed showing maintenance of the fuel system, testing of the system, or registration of the 20,000-gallon tank with MDNR. The 20,000-gallon UST should be registered with MDNR. Tier II reporting, periodic UST integrity testing, and periodically maintenance to the manufacturers standards would protect the Site from future non-compliance and environmental risks.

- Tunnels connect the major buildings on the Site and cross north, east, and south to other SLAAP and SLOP areas. The tunnels were used as a utility conduit for various carrier pipelines. The historical use of each and every line and the potential hazardous materials they carried could not be determined. The vast system of tunnels and the associated utility pipes in each tunnel is a concern. Whether the lines carried petroleum or possibly PCB containing oils at earlier periods is unknown. An inventory of all currently unused utility pipes should be conducted to ensure they are fully investigated verifying that contents are known.

Recommendations - Based on the conclusions in this report, the following actions are recommended to further identify the environmental condition of the Site:

- The historical SLOP operations on the Site are recognized environmental conditions to the Site. The Site has not been fully investigated to determine whether contamination occurred and if so, to what extent contamination impacted the Site. It is recommended that GSA take proactive steps prior to EPA directives to environmentally investigate contamination at the Site. Target contaminates include RCRA metals, VOCs, solvent related wastes, characteristic testing, petroleum hydrocarbons-diesel and gasoline range, PCBs, and explosive residuals. A broad-based testing regime is recommended due to the extensive grading at the Site.

- The historical Powder Storage south of Buildings 102, 103, 104, & 105 are recognized environmental conditions to the Site. The target contaminate would be for explosive residuals. A targeted sampling at the areas where the buildings were located along with a broad-based testing regime is recommended due to the extensive grading at the Site.

- The historical movement of metal shavings from the buildings at the Site, into the transportation containers, and across the Site for transportation to recycling facilities off-Site is a

recognized environmental condition to the Site. Railroad tracks were situated between Buildings 102 &103, Buildings 103 & 104, Buildings 104 & 105, and south of Building 105. Staging areas for railcars would have been located near the buildings. Target contaminates include metals, petroleum hydrocarbons, and PCBs. A targeted sampling at the staging areas and at intervals along the railroad tracks is recommended at the Site.

- The historical wastewater generation at the SLOP facility is a recognized environmental condition to the Site. The sewer system included brick lined manholes and several types of drain line materials. Soil near the drain lines and ground water under the Site may have been impacted. Target contaminates include RCRA metals, solvent related wastes, characteristic testing, petroleum hydrocarbons-diesel and gasoline range, PCBs, VOCs, and explosive residuals. A targeted sampling along the drain lines and toward the east (down-gradient) of the Site is recommended.

- The sediments in the sewer system are recognized environmental conditions to the Site. Sediments in the manholes and drain lines are potentially hazardous waste. Target contaminates include RCRA metals, solvent related wastes, characteristic testing, petroleum hydrocarbons-diesel and gasoline range, PCBs, VOCs, and explosive residuals. A targeted sampling along representative segments of the sewer system is recommended to determine if contaminates exist.

- The Lead Shop Building 112 (presently labeled Building 103 F) is a recognized environmental condition to the Site. Lead contamination may exist around the building and specifically on the southwest corner of the Building. Targeted contaminate is lead. A targeted sampling along the southwest side of the building is recommended to determine if contamination exists.

- The Childcare Facility is located in Building 104 E at the Site. Lead testing of the soil is recommended on all soil around Building 104 E where children might come into contact with the soil. The Lead Shop Building (presently labeled Building 103 F) was located immediately west of this Childcare Facility.

- The electrical Sub Stations Buildings 108 A, 108 B, and 208 B are recognized environmental conditions to the Site. PCB oils may exist in sumps and soils under the buildings. Targeted contamination includes petroleum hydrocarbons and PCBs. Targeted sampling is recommended to include soils from the sumps, water from the sumps, and groundwater near the vicinity of the buildings.

- The adjoining SLOP and SLAAP facilities are recognized environmental conditions to the Site. The Site has not been fully investigated to determine whether contamination occurred from the adjacent SLOP and SLAAP operations and if so, to what extent contamination impacted the Site. Target contaminates include RCRA metals, solvent related wastes, PAHs, VOCs, characteristic testing, petroleum hydrocarbons-diesel and gasoline range, PCBs, and explosive residuals. A broad-based testing regime is recommended on the boarders of the Site to determine possible migration into the Site from adjacent ammunition facilities.

- The adjoining industrial facility located at 4200 Goodfellow Boulevard is a recognized environmental condition to the Site. The Site has not been fully investigated to determine whether contamination occurred from the adjacent manufacturing/fork truck facility and if so, to what extent contamination impacted the Site. Target contaminates include metals, solvents, and petroleum hydrocarbons. Targeted testing is recommended east of the 4200 Goodfellow Boulevard facility to include soil and groundwater.

- The Indoor Shooting Range, in the south end of Building 105, is a recognized environmental condition to the Site. The shooting range was not investigated to determine whether contamination remains from past shooting activities. The targeted contamination is lead and lead dust. Targeted testing is recommended for all components of the gallery, debris in the receiving bins, sand in the bins, sand on the floor, and wipe samples across the basement floor.

- The natural gas valves and controls located on the southeast corner of the Site are unprotected but are not recognized environmental conditions to the Site. Recommend protection to the appurtenance to protect it from vehicular collision or purposeful breaching of the natural gas station.

- The 20,000-gallon and 600-gallon underground storage tanks at the Site are not registered with the MDNR but are not recognized environmental conditions to the Site. Recommend that the 20,000-gallon UST be registered with the MDNR. Additionally recommend that Tier II reporting, periodic UST integrity testing, and periodically maintenance to the manufacturers standards protect the Site from future non-compliance and environmental risks.

- The tunnels, which connect the major buildings on the Site, traverse north, east, and south to other SLAAP and SLOP areas. The tunnels contain historic utility conduits for various carrier pipelines. This situation is considered a recognized environmental condition to the Site. Recommend that an inventory of all currently unused utility pipes be conducted to ensure they are fully investigated verifying that contents are known.

9.0 LIMITATIONS

This ESA is an instrument of service for the exclusive use of General Services Administration (Client); the Clients associated Government agencies, and other associated lender(s) only. No third party may use this report, or any information contained herein. With the permission of the Client, Marc Enviro Services LLC (MES LLC) may authorize a third party to use this Report, and to rely on the information contained in this report, but only to the same extent of the Client's reliance, and subject to the same contractual, technological, and other limitations to which the Client has agreed.

Findings and recommendations of this ESA are based upon information obtained during the performance of this ESA and the conditions existing at the site on the date of the site reconnaissance.

Past conditions, uses, etc., were approximated based on available records and observations.

No sampling or testing of soil, water, air or other materials was conducted as part of this ESA. It is possible that contamination may exist, but was undetected by this ESA. The recommendations provided in an ESA do not guarantee that environmental conditions will not arise in the future. The intent of an ESA "is to identify, to the extent feasible pursuant to the processes prescribed herein, recognized environmental conditions in connection with the property."[4]

The results of this Report are based on information obtained by MES LLC, and on observations made during the site reconnaissance. MES LLC does not warrant or guarantee the environmental condition of the subject property, or certify the property as clean.

This Report is based on the current regulatory environment and current regulations and guidance. Regulatory agency interpretations, future regulatory changes, and/or policy, guidance or regulatory attitude changes may affect the environmental status of the site.

No asbestos, asbestos-containing materials (ACM), lead-based paint (LBP), radon, lead in drinking water, regulatory compliance, cultural resources, historical or archeological resources, industrial hygiene, health and safety, endangered species, indoor air quality, mold issues, high voltage power lines, methane gas, or wetland identification/delineation efforts were performed as part of this ESA.

10.0 CERTIFICATION AND SIGNATURE

I certify that this document was prepared by me or under my direct personal supervision and that I am a Registered Environmental Property Assessor and a Registered Environmental Manager as certified by the National Registry of Environmental Professionals.

Respectfully submitted,
Marc Enviro Services LLC

Prepared by,

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REFERENCES

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St. Louis City Recorder of Deeds
1200 Market Street, Room 126
St. Louis, MO 64103

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United States Department of Agriculture
Soil Conservation Service
Soil Survey of St. Louis County, Missouri

MO History Museum Library & Research
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St. Louis, MO

APPENDIX

Site Vicinity Map - Figure No. 1

Site Plan - Figure No. 2

Aerial Map 2000 - Figure No. 3

Aerial Map 1998 - Figure No. 4

Aerial Map 1981 - Figure No. 5

Soil Survey Map - Figure No. 6

Investigations

DERP FUDS Preliminary Assessment 1991

Environmental Assessment Summary - GSA

Map M - 3

Map M-1 Boundaries Map - 1991

Ordinance and Explosive Waste, Chemical Warfare Materials, Archives Search Report for St. Louis Ordinance Plant and St. Louis Ordinance Core Plant St. Louis, MI. DERP-FUDS Site Numbers B07MO0010 and B07MO0170 http://pirs.mvr.usace.army.mil/fuds/q-t/stlordpl/oe/asr/findings/toc.htm

Local Public Museum Historical Documentation

Bullets By The Billions (Article)

The Life History of a Cartridge (Article)

Cartridge Cases Grow Up (Article)

The Business End of a Cartridge (Article)

The Proof House (Article)

The Primer . . . Small But Most Important (Article)

Old Small Arms Plant (Article)

Armor Piercing Cores Add Knockout Punch (Article)

Interesting Facts - Ordinance Plant

St. Louis Ordinance Plant - 1 of 3 (Article)

St. Louis Ordinance Plant - 2 of 3 (Article)

St. Louis Ordinance Plant - 3 of 3 (Article)

MDNR's Newsletter of Oct. 2001 - 1 of 2

MDNR's Newsletter of Oct. 2001 - 2 of 2

MDNR's April 13, 1999 letter on UST Closures

On Site Record Review Historical Documentation

Current Site Plan

Building 108 A - Foundation Plan

Old Site Plan

Historic Index of Buildings

Environmental Database Documentation

EDR Database Information

EDR No Coverage with Sanborn Maps

APPENDIX

Historical Photographs

A Century of Enterprise

Building 112 - South Side

Bunker 104

Building 115

Current Photographs

Photographs 1 - 2

Photographs 3 - 4

Photographs 5 - 6

Photographs 7 - 8

Photographs 9 - 10

Photographs 11- 12

Photographs 13 - 14

Photographs 15 - 16

Photographs 17 - 18

Photographs 19 - 20

Photographs 21 - 22

Photographs 23 - 24

Photographs 25 - 26

Photographs 27 - 28

1ASTM Standard E 1527-00, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, May 10, 2000, p. 1.

2ASTM Standard E 1527-00, May 10, 2000, p. 10.

342 USC § 9601(35)(B)

4ASTM Standard E 1527-00, p. 10.