

**Audit**



**Report**

OFFICE OF THE INSPECTOR GENERAL

MILITARY CONSTRUCTION OF THE DEFENSE  
MAPPING AGENCY PRINTING AND DISTRIBUTION  
PLANT, ST. LOUIS, MISSOURI

Report No. 96-070

February 13, 1996

**Department of Defense**

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### **Acronyms**

DMA  
MILCON

Defense Mapping Agency  
Military Construction



**INSPECTOR GENERAL**  
**DEPARTMENT OF DEFENSE**  
**400 ARMY NAVY DRIVE**  
**ARLINGTON, VIRGINIA 22202-2884**



February 13, 1996

**MEMORANDUM FOR UNDER SECRETARY OF DEFENSE (COMPTROLLER)**  
**DIRECTOR, DEFENSE MAPPING AGENCY**  
**DEPUTY ASSISTANT SECRETARY OF DEFENSE**  
**(INSTALLATIONS)**

**SUBJECT:** Audit Report on Military Construction of the Defense Mapping Agency  
Printing and Distribution Plant, St. Louis, Missouri  
(Report No. 96-070)

We are providing this report for review and comment. This report is one of a series of reports about the FY 1996 military construction for Defense agencies. We considered comments on a draft of this report from the Under Secretary of Defense (Comptroller), the Defense Mapping Agency, and the Deputy Assistant Secretary of Defense (Installations) in preparing the final report.

DoD Directive 7650.3 requires that all recommendations and potential monetary benefits be resolved promptly, with adjudication by the Deputy Secretary of Defense if necessary. Based on discussions with Defense Mapping Agency staff, we understand that management prefers immediate elevation of the matter to the Deputy instead of the normal audit mediation process.

We request that the Under Secretary of Defense (Comptroller) provide comments on Recommendation A.2. We request the Defense Mapping Agency provide additional comments on Recommendations A.1.a, A.1.b., and B.1. In addition, we ask that the Deputy Assistant Secretary of Defense (Installations) provide comments on Recommendation A.1.b. Comments should be received by March 13, 1996, for incorporation into the adjudication package that will be coordinated and forwarded to the Deputy Secretary of Defense, should unresolved issues remain at that point.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. Wayne K. Million, Audit Program Director, at (703) 604-9312 (DSN 664-9312) or Mr. Henry P. Hoffman, Audit Project Manager, at (703) 604-9269 (DSN 664-9269). If management requests, we will provide a formal briefing on the audit results. See Appendix E for the report distribution. The audit team members are listed inside the back cover.

Robert J. Lieberman  
Assistant Inspector General  
for Auditing

Office of the Inspector General, DoD

Report No. 96-070  
(Project No. 5CG-0055.02)

February 13, 1996

**Military Construction of the Defense Mapping Agency  
Printing and Distribution Plant, St. Louis, Missouri**

**Executive Summary**

**Introduction.** This report is one in a series of reports on the FY 1996 military construction program for Defense agencies. This report discusses the requirements for the purchase of land for and the construction of the Defense Mapping Agency printing and distribution plant in St. Louis, Missouri. The cost estimate for the project is \$40.3 million. The construction project is to replace a facility that was destroyed by flood. Because it will consolidate several Defense Mapping Agency functions, the project conforms to one of the top priorities of DoD, to reduce infrastructure.

**Audit Objectives.** The audit objectives were to determine whether Defense agencies properly planned and programmed FY 1996 proposed military construction projects and whether the decisions for military construction were supported with required documentation, including an economic analysis. An additional audit objective was to evaluate management controls over planning and programming the proposed FY 1996 military construction projects. This report discusses the objectives as they apply to construction of a printing and distribution plant for the Defense Mapping Agency.

**Audit Results.** The Defense Mapping Agency did not thoroughly evaluate existing Government sites and buildings that should have been considered when planning for a new printing and distribution plant in St. Louis, Missouri. As a result, the Defense Mapping Agency could miss an opportunity to use excess or available Government land and facilities at a lesser cost (Finding A).

Project scope reductions have not resulted in commensurate cost savings. The plans for the printing and distribution plant contained features that are not appropriate to an industrial facility and that unnecessarily increase the cost of construction. As a result, the Defense Mapping Agency requested as much as \$7 million more in construction funds than are needed (Finding B).

The table below illustrates the progression of DMA space requirements and corresponding construction costs for the plant.

	Facility Square Feet (thousands)	Cost Per square foot	Total Cost (millions)
October 1993	570	\$ 57	\$46.0
January 1994	418	69	40.0
September 1994	340	89	40.3
February 1995	256	115	40.3

Appendix A summarizes our review of management controls. The total potential savings from this report would be determined after the Defense Mapping Agency completes thorough and auditable economic analyses of site alternatives to determine the most cost-effective approach to meeting the requirement. Appendix C summarizes the potential benefits of the audit.

**Summary of Recommendations.** We recommend that the Defense Mapping Agency place the project on hold until it performs thorough and auditable economic analyses of potential sites to determine whether existing Government land or facilities are available. We also recommend that the Defense Mapping Agency revise the facility design to achieve \$7 million in cost reductions. We recommend the Under Secretary of Defense (Comptroller) suspend funds for the project until the Defense Mapping Agency completes thorough and auditable economic analyses.

**Management Comments.** The Under Secretary of Defense (Comptroller) agreed that the proposed facility is overpriced by approximately \$7 million. The Comptroller will release \$33.3 million for construction of the plant. The Defense Mapping Agency nonconcurred with the findings and recommendations, stating the audit report presents factually incorrect and misleading information. In addition, the Deputy Assistant Secretary of Defense (Installations) provided comments nonconcurring with the draft report. Those comments were based on information provided by the Defense Mapping Agency. A summary of management comments is in Part I, and the complete text of management comments is in Part III.

**Audit Response.** We consider the comments by the Under Secretary of Defense (Comptroller) on releasing a lesser amount of funds to be partially responsive. We request that the Under Secretary of Defense (Comptroller) comment on the recommendation to suspend all of the FY 1996 military construction funds for the plant until the Defense Mapping Agency completes thorough and auditable economic analyses demonstrating full consideration of alternatives. Based on management comments, we deleted one recommendation and revised another, but we stand by the conclusion that the facility is overdesigned. We acknowledge the Defense Mapping Agency request to expedite resolution of the audit issues. We request that the Defense Mapping Agency reconsider its position and provide additional comments on the recommendations. We also ask that the Deputy Assistant Secretary of Defense (Installations) reconsider his position and provide additional comments. All comments should be provided by March 13, 1996, for incorporation into the adjudication package that will, if necessary, be forwarded to the Deputy Secretary of Defense.

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## **Part I - Audit Results**

### **Audit Background**

The proposed Defense Mapping Agency (DMA) facility in St. Louis, Missouri, estimated to cost \$40.3 million, is one of 50 FY 1996 Defense agency military construction (MILCON) projects totaling \$379 million.

### **Audit Objectives**

The audit objectives were to determine whether Defense agencies properly planned and programmed proposed FY 1996 MILCON projects and whether the decisions for MILCON were supported with required documentation, including an economic analysis. An additional audit objective was to evaluate management controls over planning and programming the proposed FY 1996 MILCON projects. This audit report specifically discusses the project for the land acquisition for, and construction of, the proposed DMA printing and distribution plant. See Appendix A for a discussion of the audit scope and methodology and the management control program review.

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## **Finding A. Land Acquisition for and Construction of a Printing and Distribution Plant**

DMA did not thoroughly evaluate alternative Government sites and buildings that should have been considered when planning a new site and new construction for a printing and distribution plant in St. Louis, Missouri. That situation occurred because DMA did not prepare thorough and auditable economic analyses of existing facilities after the building size was reduced by 55 percent. As a result, DMA planned for new land acquisition and new construction costing \$40.3 million and could miss an opportunity to use excess or available Government land and facilities at a lesser cost.

### **Background**

**DoD Infrastructure Initiatives.** Since 1988, DoD, at the direction of Congress, has been attempting to reduce its infrastructure. That mission was reiterated by the Secretary of Defense in a memorandum to all elements of DoD, "1995 Base Realignment and Closure (BRAC 95)," January 4, 1994. The memorandum stated, "Reducing the Department's unneeded infrastructure . . . is a top Defense priority." The memorandum also recommended that the Department place "a strong emphasis on cross-service utilization of common support assets."

**DMA Mission.** DMA provides mapping, charting, and digital products essential to U.S. military operations and modern weapon systems. The printing and distribution of the products primarily occurred at the DMA South Broadway Complex, St. Louis, Missouri.

**Flood Damage.** In July 1993, the South Broadway Complex was inundated with flood waters and suffered extensive damage. The South Broadway Complex's administrative, storage, and lithographic plate-making functions were relocated to leased space and other local DMA facilities. The graphic arts center was closed for a period of time to recondition the printing presses damaged by flood water.

**Build or Renovate Facilities at New Location.** After the flood, DMA determined that renovating the flooded facility was too costly. The flooded site is located at the junction of the River Des Peres and the Mississippi River and within a 100-year flood plain. Executive Order 11988, "Floodplain Management," states that flood proofing and other flood protection measures shall be applied to new construction or rehabilitation. Also, agencies shall, wherever practicable, elevate structures above the base flood level rather than filling in land. Since renovation of the facility would be extremely expensive and still leave the site vulnerable to flooding, DMA decided to relocate the printing and distribution plant to a new site.

## **Finding A. Land Acquisition for and Construction of a Printing and Distribution Plant**

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**Consolidation of DMA Production and Distribution Functions.** The proposed MILCON project will replace the South Broadway Complex and collocate the printing and distribution functions for the agency at a single facility. The graphic arts center that was located at the South Broadway Complex will be consolidated with the printing operations now located at the Hydrographic/Topographic Center in Bethesda, Maryland; the supply and reproducible material storage facility now in Riverdale, Maryland; and the storage and distribution center now located at the Combat Support Center's Philadelphia Depot, Naval Aviation Supply Office, Philadelphia, Pennsylvania.

### **Land Acquisition**

**DMA Verifying Available Land and Buildings.** DoD Directive 4165.6, "Real Property Acquisition, Management, and Disposal," September 1, 1987, requires that excess or otherwise available property held by other Military Departments or Federal agencies must be considered before acquiring real property by purchase or lease. DMA contacted various Military Departments, other Federal agencies, and State and local governments after the flood to determine the availability of usable land, buildings, or a combination of both for the proposed printing and distribution plant. The DMA survey of Government land and facilities was performed from August 1993 through January 1994. A DD Form 1391, "Military Construction Project Data," October 1993, identified a requirement for a 570,000-square-foot building. A revised DD Form 1391 in January 1994 specified a 418,500-square-foot building. DMA rejected all sites offered because of:

- high costs to renovate,
- inadequate size,
- flood-plain location, or
- environmental contamination.

**Land Purchase.** Because it had ruled out other options, DMA, in conjunction with the U.S. Army Corps of Engineers, Kansas City, Missouri, in June 1994 solicited interested parties to submit sites for land purchase. The U.S. Army Corps of Engineers evaluated the responses for DMA and performed an environmental assessment and site feasibility study to determine the preferred site. After reviewing the environmental assessment and site feasibility study in July 1994, DMA selected a 38-acre site in Arnold, Missouri, south of St. Louis. DMA negotiated the land price for \$940,000 and paid \$78,000 for an option to purchase the land.

**Change in Building Size.** The size of the proposed printing and distribution plant decreased as DMA developed plans for the consolidation. The DD Form 1391 prepared in October 1993 by DMA identified a requirement for a 570,000-square-foot facility. A revised DD Form 1391 in January 1994

## **Finding A. Land Acquisition for and Construction of a Printing and Distribution Plant**

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specified a 418,500-square-foot facility. Another revised DD Form 1391 in September 1994 specified a 340,000-square-foot facility. In February 1995, still another revised DD Form 1391 called for a 256,000-square-foot facility.

**Continued Surveillance of Facilities.** DoD Directive 7040.4, "Military Construction Authorization and Appropriation," March 5, 1979, requires continued surveillance of existing facilities that can be jointly utilized, converted, or altered to satisfy new requirements or acquired and adapted to military use at minimum construction cost.

DoD Directive 7041.3, "Economic Analysis and Program Evaluation for Resource Management," October 18, 1972, requires continuous management reviews of cost and effectiveness of resource requirements for both proposed and ongoing activities. Such management reviews should include the use of economic analyses. Using costs to compare the relative merits of alternatives aids in making trade-offs between alternatives, recommending the most cost-effective alternative, and establishing or changing priorities.

The change in building size from 570,000 to 256,000 square feet, a 55 percent reduction, was significant and, therefore, warranted further study of available Government land and facilities.

### **Available Land and Facilities**

Several sites and facilities in the St. Louis area had potential for use for the DMA printing and distribution plant. Officials from the General Services Administration; the Army Aviation and Troop Command, St. Louis, Missouri; Scott Air Force Base, Illinois; and the Charles Melvin Price Support Center, Granite City, Illinois, provided information to our auditors on four potential sites.

**Army Aviation and Troop Command.** The Army Aviation and Troop Command, occupying space leased from the General Services Administration, was realigned by the 1995 Commission on Defense Base Closure and Realignment. One site occupied by the Army Aviation and Troop Command will be vacated by 1998. That location has 400,000 square feet of administrative space and 45,000 square feet of high bay storage.

DMA prepared a cost study on the site in June 1995, after learning that the 1995 Commission on Defense Base Realignment and Closure was preparing a recommendation that DMA backfill space vacated by the Army Aviation and Troop Command. The site was evaluated by DMA planners and rejected as a potential site because of an estimated cost of \$65 million. The cost estimate included \$39.9 million in construction, \$2.5 million for architectural and engineering costs, and \$23 million in missed opportunity costs. DMA defines missed opportunity costs as potential savings from consolidation that would be lost while waiting for a new site to become occupied. DMA planners were unable to provide supporting documentation for the \$65 million cost estimate.

## **Finding A. Land Acquisition for and Construction of a Printing and Distribution Plant**

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**Scott Air Force Base.** A 29-acre site on Scott Air Force Base, located near St. Louis, was available as of October 1995. The site has existing utilities and is close to a major highway. We found no indication that the site was known to DMA at the time of the site survey.

**Charles Melvin Price Support Center.** The Charles Melvin Price Support Center had a 40-acre site on level ground with existing utilities and no known environmental problems. That site was shown to DMA planners as a potential site for a 570,000-square-foot facility, but was rejected by DMA because Executive Order 11988 prohibits building on a flood plain. The Charles Melvin Price Support Center, according to the U.S. Army Corps of Engineers, St. Louis District, is located on a 500-year flood plain and Executive Order 11988 applies only to areas with 1 per cent or greater chance of flood (that is, 100-year flood plains). The levee that protects the Charles Melvin Price Support Center held during extensive flooding of the Mississippi River in 1993. The U.S. Army Corps of Engineers determined that the levee had no damage resulting from the flood and was never close to failure. Additionally, the U.S. Army Corps of Engineers has a \$43 million project underway for maintenance of the levee.

**St. Louis Army Ammunition Plant.** The St. Louis Army Ammunition Plant, in addition to having 21 acres of free land, had three available buildings with 372,000 square feet that could be renovated for less than the cost of new construction. DMA rejected this site because of the high cost to renovate, contamination, size, restrictive floor-to-ceiling height, and column spacing. General Services Administration personnel stated that they were responsible for cleaning up the environmental contamination as well as renovation costs, construction costs, or both, required for any construction project. General Services Administration personnel stated that they could accommodate DMA construction requirements.

## **Consideration of Available Land and Facilities**

**Office of the Secretary of Defense Guidance.** The decision to purchase land and construct a new building in the St. Louis area when vacant land and buildings were available in the same geographic area was not commensurate with guidance from the Office of the Secretary of Defense. The "Department of Defense Base Closure and Realignment Report," March 1995, stated:

With the end of the Cold War, the Department of Defense has undertaken a restructuring of its military forces. During the past decade, the number of servicemen and women has been reduced by one-third. In real terms overall Defense spending has declined by 40 percent. The Department's *physical infrastructure, too, must be reduced*. Unless the infrastructure is downsized commensurately with the force structure and budget, *funds will be spent on buildings* instead of readiness and modernization. [emphasis added]

## Finding A. Land Acquisition for and Construction of a Printing and Distribution Plant

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**Review of Potential Sites.** DMA should have taken another look at available land and sites after the building size was drastically reduced. Although DMA planners sought and reviewed information on available Federal land and facilities, the search was based on requirements for a 570,000-square-foot facility. Even so, one site at the Charles Melvin Price Support Center met DMA requirements, but was eliminated because DMA planners incorrectly believed that Executive Order 11988 prohibited construction at that site. Additionally, previously rejected sites and facilities had further potential after DMA reduced the building size to 256,000 square feet, a 55-percent reduction.

**Action by Management.** DMA received a working draft of this report in September 1995. After reviewing the report, DMA planners conducted site surveys at Scott Air Force Base, Charles Melvin Price Support Center, and St. Louis Army Ammunition Plant. DMA provided us the results of those site surveys. For each site survey, DMA could not provide support or documentation other than rough order of magnitude estimates for the costs contained in the site surveys.

DMA included opportunity costs in the survey site reviews. Those costs were based on DMA not consolidating and moving to the Arnold site on time. Included in the opportunity costs are personnel reduction costs. Program Decision Memorandum 362, November 10, 1993, requires DMA to reduce personnel 4 percent a year for FYs 1994 through 1999. DMA has not provided supportable evidence on how those reductions relate to moving to the Arnold site. Further, DMA has not provided documentation to support the opportunity costs in the survey site reviews.

We believe that FY 1996 MILCON plans to construct a DMA printing and distribution plant should be suspended until it has been clearly demonstrated, by *thorough* and *auditable* economic analyses of all potential sites and facilities, that available Federal land and facilities in the St. Louis area are not suitable for the proposed printing and distribution plant.

## Management Comments on the Finding and Audit Response

**DMA Comments.** DMA stated that over the course of 5 months, it considered all potential Government sites in the St. Louis area. All sites were rejected due to size, economics, environmental contamination, and flooding considerations. DMA recently performed site surveys/economic analyses at sites identified by the Office of the Inspector General, DoD, some of which had already been rejected by DMA.

**Audit Response.** From August 1993 to January 1994, DMA performed reviews of selected sites for a 570,000-square-foot facility. During those reviews, DMA did not perform economic analyses of the potential sites. Further, DMA did not continue to consider Government sites after the decision was made to purchase the Arnold site. For example, the Office of the Inspector General, DoD, brought to the attention of DMA during the audit the fact that

## **Finding A. Land Acquisition for and Construction of a Printing and Distribution Plant**

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Scott Air Force Base would have land available for development. Until DMA received a draft of this report, DMA did not reconsider the sites after the size of the building was reduced by 55 percent to 256,000 square feet. Although the DMA consolidation plan is commendable, the supporting facilities planning remains questionable.

## **Recommendations, Management Comments, and Audit Response**

### **A.1. We recommend that the Director, Defense Mapping Agency:**

a. Perform thorough and auditable economic analyses of available Federal land and facilities in the St. Louis area to determine the most economical site and facility for the Defense Mapping Agency printing and distribution plant.

b. Place the project on hold until the economic analyses are completed.

**Defense Mapping Agency Comments on Recommendation A.1.a.** The DMA nonconcurred with Recommendation A.1.a, stating that it, in concert with the U.S. Army Corps of Engineers, conducted site survey studies/economic analyses of the four alternate sites discussed in the audit report. The site surveys were in conformance with the Scott Air Force Base survey format agreed to by the audit team. The DMA used the standard "ECONPACK" software provided by the Corps of Engineers for evaluating alternatives in support of military construction projects. The DMA analyses indicate that the Arnold, Missouri, site is the most economical alternative. The complete text of the DMA comments is in Part III.

**Audit Response.** We disagree with DMA because, as stated in the finding, DMA did not prepare thorough and auditable analyses of the four alternate sites. DMA prepared a site survey/economic analysis for the Scott Air Force Base site after receiving a working copy of this draft report. DMA planners asked us whether the format for that analysis was acceptable. The audit team said the format for an economic analysis is not defined, but that the costs and methodology used in the analysis had to be supportable.

The site surveys/economic analyses that DMA provided were not supported by documentation and could not be verified. For example, DMA could not provide the auditors with adequate documentation to support the dollar values that appeared in the site surveys/economic analyses. Additionally, DMA used the cost factors developed for the Arnold site for the alternate sites. For example, site preparation costs of \$5.7 million were the same for the Arnold site, which is hilly, and the Scott Air Force Base site, which is flat.

The DMA conducted site surveys/economic analyses at Scott Air Force Base, the Charles Melvin Price Support Center, and the St. Louis Army Ammunition

## **Finding A. Land Acquisition for and Construction of a Printing and Distribution Plant**

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Plant only after receiving a working draft of this audit report in September 1995. DMA reviewed the site at the Army Aviation and Troop Command in June 1995, after DMA learned that the 1995 Commission on Defense Base Realignment and Closure was preparing a recommendation that DMA backfill space that was to be vacated. The auditors asked for documentation supporting the analysis; however, DMA stated that no documentation existed to support the analysis because the dollar values were based on its professional judgment. Additionally, in that site survey, DMA included \$5 million for roof replacement for building 104, even though the General Services Administration had replaced the roof 2 years prior to the analysis. Further, DMA included \$2 million for site work for a traffic light that already existed. Also, DMA included a contingency figure of 20 percent in the cost estimate, which is 10 percent more than the Tri-Service Committee on Cost Engineering Cost Factors uses. General Services Administration personnel stated that, because they were responsible for the building, they would fund any renovations and construction. Therefore, the costs would not be incurred by DoD.

DMA made the decision to purchase a commercial site before economic analyses were performed for the Charles Melvin Price Support Center, the St. Louis Army Ammunition Plant, and the Army Aviation and Troop Command. The DMA did not provide evidence that it continued to consider Government sites as the building size was reduced or when other sites became available.

The "ECONPACK" software is a standard package that computes values based on information supplied by the user. The DMA information that was used in the "ECONPACK" software was not supportable or auditable for the alternate sites. Therefore, the most economical site has yet to be definitively identified, and it is premature to execute the current project plan. We request that DMA reconsider its position and provide additional comments on the recommendation in response to the final report.

**Defense Mapping Agency Comments on Recommendation A.1.b.** The DMA nonconcurrent with Recommendation A.1.b., stating that it has provided the audit team with site surveys/economic analyses that indicate that the Arnold, Missouri, site remains the most economical alternative. Further, pursuing any alternatives to the Arnold site will cause a delay of 12 to 18 months and incur opportunity costs of \$1 million per month.

The DMA solicited comments from the Director, Energy and Engineering, Office of the Deputy Assistant Secretary of Defense (Installations), who stated, "Unless there is some compelling reason to have the facility located at Scott Air Force Base, other than to avoid land acquisition, I would not concur in deferring the project." The Director, Energy and Engineering, also stated that "lost productivity improvement [caused by a delay in resetting the project] would dwarf any saving in land acquisition or scope reduction."

**Audit Response.** We disagree with DMA because the site surveys/economic analyses were not thorough and auditable. Because the DMA could not provide support for the opportunity costs or documentation for the cost estimates contained in the site surveys, we could not determine whether the Arnold site is

## **Finding A. Land Acquisition for and Construction of a Printing and Distribution Plant**

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the most economical alternative. The DMA identified opportunity costs of \$11.5 million per year (potential savings from the DMA consolidation) that would be lost while waiting for the site to become available in all the site analyses. However, when asked to show support for opportunity costs, DMA provided new cost estimates of \$12 to \$13 million per year with no supporting detail. DMA personnel could not explain to the auditors how they arrived at the estimates for opportunity costs. Further, DMA is mandated by law to reduce personnel 4 percent per year from FYs 1994 through 1999. DMA included such personnel reductions in the opportunity costs associated with the proposed construction project. Personnel reductions will have to occur regardless of whether or not the construction project is completed on time. DMA planners could not explain how those personnel reductions related to waiting for a site to become available.

The comments by the Director, Energy and Engineering, Office of the Deputy Assistant Secretary of Defense (Installations), are based on information provided by DMA and a draft of this report. The information provided by DMA to the Director was not supported. DMA has not been able to support the opportunity costs of \$1 million per month. We request DMA reconsider its position and provide additional comments on the recommendation in response to the final report. Likewise, we request the Office of the Deputy Assistant Secretary (Installations) to reconsider its position and provide comments to us for inclusion in the adjudication package.

**A.2. We recommend that the Under Secretary of Defense (Comptroller) suspend the \$40.3 million FY 1996 military construction funds for the new Defense Mapping Agency printing and distribution plant until the Defense Mapping Agency completes the economic analyses to determine the most economical site and facility for its printing and distribution mission.**

**Under Secretary of Defense (Comptroller) Comments on Recommendation A.2.** The Under Secretary of Defense (Comptroller) did not comment on this recommendation. We ask the Under Secretary to do so in response to the final report.

**Defense Mapping Agency Comments on Recommendation A.2.** Although not required to comment, the DMA nonconcurred with Recommendation A.2., stating that withholding funds is unwarranted. The DMA stated it has already performed site surveys/economic analyses on alternative sites that determined that the Arnold, Missouri, site is the least costly alternative.

**Audit Response.** We disagree with DMA because, as stated earlier, the site surveys/economic analyses have not clearly demonstrated that the Arnold site is the most economical alternative.

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## **Finding B. Features of Plant Design**

DMA plans for constructing a printing and distribution plant in St. Louis, Missouri, include design features that are not appropriate to an industrial facility and that unnecessarily increase the cost of construction. That situation resulted from DMA reducing the size of the planned printing plant to match construction estimates without eliminating costly design features that added to the construction costs. As a result, DMA has requested as much as \$7 million more in construction funds than are needed for its printing and distribution plant.

### **Inappropriate Design Features Added to Construction Costs**

**Determining Appropriate Design.** MILCON funds that originally were needed to construct a larger building may have been applied to design features that were not needed in a facility such as the one planned. Military Handbook 1190, "Facility Planning and Design Guide," September 1, 1987, provides guidance on quality of construction and states that higher quality construction should be considered for buildings of more sophisticated occupancy, such as major headquarters buildings. It also states that a more austere quality of construction is appropriate for industrial facilities, such as shops and storage facilities. The DMA printing and distribution plant was designed with the appearance of a headquarters building, necessitating higher cost of construction than appropriate for an industrial printing and distribution plant.

**DMA Plant Design.** Appendix B shows an artist's conceptual drawing of the proposed facility. The design includes several features that add to the overall cost of the proposed plant. It includes an open lobby and exhibit space that extends three stories from the ground floor of the administrative section to an overhead glass roof. Pedestrians would walk through the lobby and exhibit areas out into an interior open courtyard, complete with landscaping. The design also includes an exercise room, shower and locker room, and rooftop terrace.

**Lobby and Exhibit Areas.** The floor space of the lobby and exhibit areas is approximately 2,600 square feet. The absence of two potential overhead floors accounts for a loss of 5,200 (2 floors times 2,600) square feet of usable space.

**Interior Courtyard.** Design plans include a 10,500-square-foot open courtyard situated within the proposed facility. Three floors of potentially usable space, or 31,500 square feet, are lost because of the courtyard.

**Exercise Room and Showers.** The plans for the proposed printing and distribution plant include approximately 4,000 square feet for an exercise room and a shower and locker room on the ground floor of the administrative section. DMA planners stated that those rooms were included in the design because all

## Finding B. Features of Plant Design

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DMA facilities are similarly equipped. The plans also include two locker areas and a shower room in the industrial area of the plant. The industrial-sited facilities are justified by union agreement. Military Handbook 1190 provides criteria for justifying exercise facilities based on military strength. However, the DMA facility will be occupied by civilian employees. DMA planners were unable to provide criteria to support that aspect of the design, nor were they able to justify the shower and locker room planned for the administrative section of the plant.

**Rooftop Terrace.** The southeast corner of the administrative section will have two floors. The second story roof will be flat and constructed to support a rooftop terrace equipped with 44 redwood planters, 6 redwood benches, and 6 redwood picnic tables.

## Inaccurate Construction Estimates Led to Reductions in the Printing Plant Size

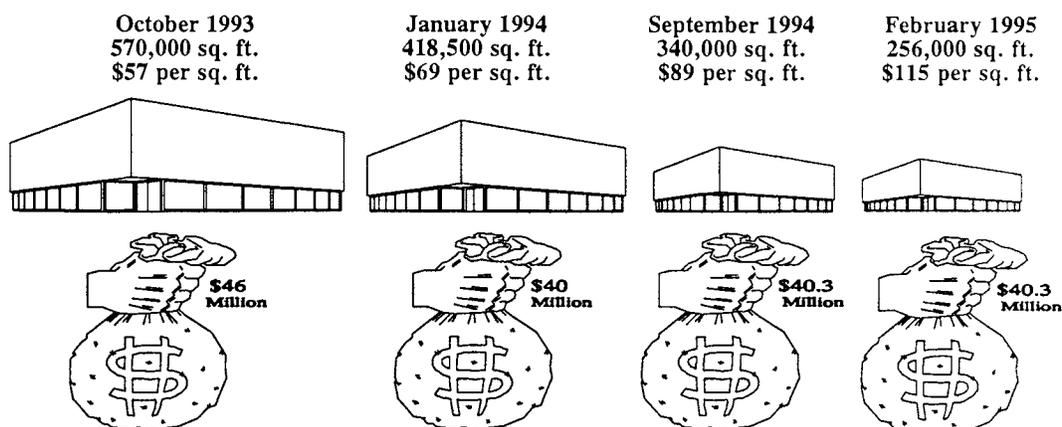
**DD Form 1391 Construction Estimates.** DMA planners prepared two DD Form 1391 construction estimates dated October 15, 1993, and January 4, 1994. The October 15 DD Form 1391 estimated \$46 million to construct a printing plant of 570,000 square feet. The January 4 DD Form 1391 estimated \$40 million to construct a printing plant of 418,500 square feet. DMA planners were not able to provide documentation supporting either of those two construction estimates.

**Design Estimates.** The DMA budget submission for the printing plant was supported by a third DD Form 1391, dated September 9, 1994, that projected a 340,000-square-foot plant at a cost of \$40.3 million. Again, DMA planners were not able to provide documentation in support of the estimate. DD Form 1391 construction estimates were prepared by DMA without the assistance of the U.S. Army Corps of Engineers. The U.S. Army Corps of Engineers was unable to validate the estimates until the project reached 35-percent design and, at that point, determined that the project cost was underestimated. The architecture and engineering contractor, Parsons Main, Inc., estimated that construction of the 340,000-square-foot plant would exceed the DMA estimate of \$40.3 million by 15 to 25 percent.

**Further Reductions.** DMA decided against requesting additional construction funds and formed a Facilities Working Group to work with the U.S. Army Corps of Engineers to identify potential reductions until the cost of the plant matched the \$40.3 million budget request. With that task accomplished, DMA submitted another revised DD Form 1391 in February 1995 that identified a 256,000-square-foot printing plant at a cost of \$40.3 million.

## Finding B. Features of Plant Design

The figure below illustrates the progression of DMA space requirements and corresponding construction costs.



**Defense Mapping Agency DD Form 1391 Military Construction Estimates for the Printing and Distribution Plant Showing Decreasing Square Feet, Increasing Cost Per Square Foot**

**Design Criteria.** DMA planners stated during the audit that Military Handbook 1010A had been used to develop the original construction estimates. The table shows estimated costs for the primary facility based on Military Handbook 1010A. DMA estimated \$29.5 million as the base cost of the facility (\$40.3 million less add-ons such as utilities, site improvements, and overhead).

Functional Area	Square Feet	Unit Cost	Total (000)
Administrative	110,953	\$ 87	\$ 9,653
Printing	65,138*	108	7,035
Warehouse	79,613*	47	3,742
Facility total	255,704		\$20,430
(times) 1.07 area cost factor			21,860
(plus) 3 percent escalation			656
<b>Total cost</b>			<b>\$22,516</b>

\*Estimated space: DMA planners could not provide exact square feet planned for printing and warehouse space.

## **Finding B. Features of Plant Design**

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The project costs should have been about \$22.5 million according to the calculation in the table. That \$22.5 million estimate is \$7 million less than the \$29.5 million projected by DMA in the February 1995 DD Form 1391. While it is not unusual for construction estimates based on design to exceed the estimates provided by Military Handbook 1010A, we believe that excesses in the DMA facility design contributed to the \$7 million difference.

The lobby and exhibit areas, interior courtyard, exercise room, administrative shower and locker room, and rooftop terrace are all nonessential areas that contributed additional costs to the plant construction estimates. Defense regulations encourage innovative facility design that will enhance employee morale, but we believe that cost consciousness must be maintained. Various aspects of the planned facility are not appropriate for an industrial plant, and their inclusion in the construction would place the DoD in a potentially embarrassing position. In light of a recent public relations debacle concerning an overdesigned complex in Northern Virginia for an intelligence organization, DoD managers should avoid any appearance of excess spending for a facility.

## **Management Comments on the Finding and Audit Response**

**DMA Comments.** DMA applied guidance from a memorandum issued on August 20, 1993, by the Office of the Under Secretary of Defense for Acquisition (now, Acquisition and Technology), "Area Cost Factors and Unit Prices for FY 1996-1997 Department of Defense Facility Construction" in preparing DD Form 1391 budget estimates for military construction projects. The area cost factors and unit prices were developed by a Tri-Service Committee on Cost Engineering. DMA planners utilized the closest fit between the DMA requirements and the unit costs identified in the Tri-Service memorandum.

**Audit Response.** Several criteria exist for preparing DD Form 1391 construction estimates. Examples of acceptable criteria are Military Handbook 1010A, the U.S. Army Corps of Engineer's Programming Application Execution System, and cost factors issued by the Office of the Under Secretary of Defense for Acquisition (now, Acquisition and Technology). DMA planners stated during the audit that Military Handbook 1010A had been used to develop construction estimates. Our analysis, based on Military Handbook 1010A indicated that the project was overpriced by approximately \$7 million. Additional analysis, using the Programming Application Execution System and the cost factors issued by the Office of the Under Secretary of Defense for Acquisition, also showed that the project was overpriced.

## Unsolicited Comments on the Finding and Audit Response

**Under Secretary of Defense (Comptroller) Comments.** The Under Secretary of Defense (Comptroller) provided unsolicited comments on the finding. Based on their own review of the construction estimates, the Under Secretary of Defense (Comptroller) agreed that the proposed facility was overpriced by approximately \$7 million and reduced construction funding proportionately. The complete text of the comments is in Part III.

**Audit Response.** In response to the Under Secretary of Defense (Comptroller) unsolicited comments, we added Recommendation B.2.

## Recommendations, Management Comments, and Audit Response

**Deleted, Renumbered, and Added Recommendations.** As a result of management comments, we deleted draft Recommendation B.1. to revise the facility design requirements to be in accordance with Military Handbook 1010A. Draft Recommendation B.2. was renumbered as Recommendation B.1. We added Recommendation B.2 to this final report in response to unsolicited comments from the Under Secretary of Defense (Comptroller), to ensure that construction funds are appropriately reduced.

**B.1 We recommend that the Director, Defense Mapping Agency, revise the facility design to reduce costs by \$7 million. Examples of potential changes would be to delete the rooftop terrace, interior courtyard, exhibit area, exercise room, and administrative locker and shower room from design plans and reduce the lobby size of the plant.**

**Defense Mapping Agency comments on Recommendation B.1.** The DMA partially concurred with Recommendation B.1., stating that the rooftop was identified as an extravagance and that it was redesigned to be minimally finished as a walkout area. The DMA nonconcurred regarding the deletion of the exercise room and accompanying administrative locker and shower room. As part of the union agreement, DMA is required to provide press room employees with uniforms and a changing and locker area. It is also prudent and common sense to provide showers at industrial facilities where chemicals are used. The Federal Personnel Manual Letter 792-15, as authorized by United States Code, title 5, section 7901, authorizes agencies to establish health services programs to promote and maintain the physical and mental fitness of their employees.

**Audit Response.** We consider DMA comments to be nonresponsive to the intent of the recommendation. The DMA stated that the rooftop terrace has been redesigned as a walkout area. That constitutes more of a change in terminology than design. The walkout area will still require a safety railing and an improved roof to support foot traffic.

## **Finding B. Features of Plant Design**

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The draft audit report did not question the locker areas and shower room included in the design for the industrial side of the printing plant. The discussion in the finding has been revised to clarify that we believe the design should not include the separate locker and shower room for the administrative personnel. The DMA comments on the union agreement are appropriate only to the industrial section of the plant and do not address the nonessential locker and shower room that will be built in the administrative section of the plant. The Federal Personnel Manual Letter 792-15, as authorized by United States Code, title 5, section 7901, does provide authorization for facilities that will promote physical and mental health. However, DoD regulations do not provide provisions for including an exercise room in Defense industrial facilities.

Reducing the cost of the planned facility is not so much a matter of compliance with regulations as it is a question of prudent stewardship of DoD funds. Rather than argue the merits of each design feature, we believe management should focus on the need to make whatever design changes are needed to reduce cost per square foot and total project costs. The original recommendation has been reworded accordingly. The Under Secretary of Defense (Comptroller) decision to withhold \$7 million from the project is responsive to the intent of the recommendation. Additional savings are possible, depending on the results of the actions recommended under Finding A.

## **Part II - Additional Information**

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## **Appendix A. Scope and Methodology**

### **Scope**

We reviewed the estimation process for the DD Form 1391, "Military Construction Project Data," February 1995, for construction of a DMA printing and distribution plant. This audit was part of a review of the overall FY 1996 MILCON program budget submission for Defense agencies.

We performed this economy and efficiency audit from June through November 1995 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD, and accordingly, included tests of management controls considered necessary.

### **Methodology**

To conduct our audit, we:

- reviewed supporting documentation for the cost estimates on the February 1995 DD Form 1391;
- reviewed the economic analyses for building, leasing, and renovation;
- visited existing DMA facilities, Scott Air Force Base, Charles Melvin Price Support Center, Army Aviation and Troop Command, and St. Louis Army Ammunition Plant; and
- interviewed personnel from the U.S. Army Corps of Engineers, General Services Administration, Military Departments, Office of the Under Secretary of Defense (Comptroller), and Office of the Assistant Secretary of Defense (Economic Security), as well as personnel responsible for preparing cost estimates at DMA.

A complete list of organizations visited or contacted is in Appendix D.

### **Use of Technical Assistance**

Cost price analysts from the Technical Assessment Division, Analysis Planning and Technical Support Directorate, Office of the Assistant Inspector General for Auditing, DoD, assisted in this audit. Analysts evaluated the site survey reviews and related documentation prepared by DMA planners.

## Management Control Program

DoD Directive 5010.38, "Internal Management Control Program," April 14, 1987, requires DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

**Scope of Review of the Management Control Program.** We reviewed the DMA FY 1995 management control program related to the process for planning and programming the proposed MILCON. We also reviewed any self-evaluation of that program.

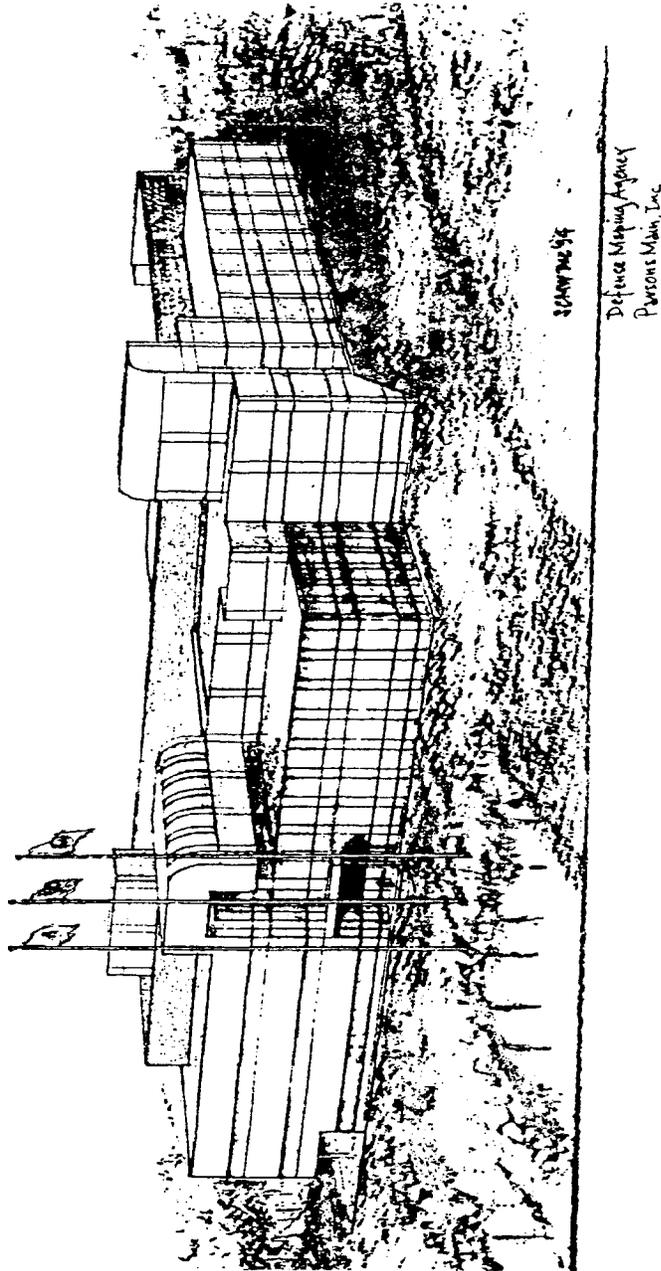
**Adequacy of Management Controls.** The requirement to consider alternatives in a documented economic analysis when planning capital investments is a fundamental DoD management control for the MILCON program. The failure to complete thorough economic analysis for this project constitutes a material management control weakness. DMA did not include the MILCON process as an assessable unit in its management control program because DMA has not been responsible for military construction in the past. If construction for DMA is programmed in the future, DMA should ensure that the MILCON process is included in an assessable unit.

## Prior Audits and Other Reviews

No prior audits or other reviews related to the MILCON process at DMA have been performed within the past 5 years.

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## Appendix B. Artist's Conceptual Drawing of Proposed Printing and Distribution Plant



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## Appendix C. Summary of Potential Benefits Resulting From Audit

Recommendation Reference	Description of Benefit	Amount and Type of Benefit
A.1.a.	Economy and Efficiency. Provides for beneficial use of available Federal land or facilities.	Undeterminable.*
A.1.b.	Economy and Efficiency. Places project on hold pending determination of beneficial use of available Federal land or facilities.	Undeterminable.*
A.2.	Economy and Efficiency. Suspends funding for DMA FY 1996 MILCON until Federal land or facilities are reviewed for possible DMA use.	Undeterminable.*
B.1.	Economy and Efficiency. Changes design to delete unnecessary features.	\$7 million of FY 1996 MILCON funds put to better use.

\*Exact amount of benefits to be realized will be determined by the cost to locate the printing and distribution plant on available Federal land or facilities, should an alternative be found to planned construction.

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## **Appendix D. Organizations Visited or Contacted**

### **Office of the Secretary of Defense**

Under Secretary of Defense (Comptroller), Washington, DC  
Deputy Assistant Secretary of Defense (Installations), Washington, DC

### **Department of the Air Force**

Headquarters, U.S. Air Force Civil Aviation Branch, Washington, DC  
Base and Units Division, Washington, DC  
Scott Air Force Base, IL  
Air Mobility Command, Scott Air Force Base, IL

### **Department of the Army**

U.S. Army Aviation and Troop Command, St. Louis, MO  
Charles Melvin Price Support Center, Granite City, IL  
St. Louis Army Ammunition Plant, St. Louis, MO  
Headquarters, U.S. Army Corps of Engineers, Washington, DC  
Kansas City District, MO  
St. Louis District, MO

### **Other Defense Organization**

Headquarters, Defense Mapping Agency, Fairfax, VA  
Aerospace Center, St. Louis, MO

### **Non-Defense Organizations**

General Services Administration, Kansas City, MO  
Leadership Council - Southwestern Division, Granite City, IL

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## **Appendix E. Report Distribution**

### **Office of the Secretary of Defense**

Under Secretary of Defense (Comptroller)  
Deputy Chief Financial Officer  
Deputy Comptroller (Program/Budget)  
Assistant Secretary of Defense (Command, Control, and Communications)  
Assistant Secretary of Defense (Economic Security)  
Deputy Assistant Secretary of Defense (Installations)  
Assistant Secretary of Defense (Legislative Affairs)  
General Counsel, DoD  
Assistant to the Secretary of Defense (Public Affairs)  
Director, Defense Logistics Studies Information Exchange

### **Department of the Army**

Headquarters, U.S. Army Corps of Engineers  
Auditor General, Department of the Army

### **Department of the Navy**

Assistant Secretary of the Navy (Financial Management and Comptroller)  
Auditor General, Department of the Navy

### **Department of the Air Force**

Assistant Secretary of the Air Force (Financial Management and Comptroller)  
Auditor General, Department of the Air Force

### **Other Defense Organizations**

Director, Defense Contract Audit Agency  
Director, Defense Logistics Agency  
Director, Defense Mapping Agency  
Director, National Security Agency  
Inspector General, National Security Agency

## **Non-Defense Federal Organizations and Individuals**

General Services Administration  
Office of Management and Budget  
Technical Information Center, National Security and International Affairs Division,  
General Accounting Office

Chairman and ranking minority member of each of the following congressional committees and subcommittees:

Senate Committee on Appropriations  
Senate Subcommittee on Defense, Committee on Appropriations  
Senate Committee on Armed Services  
Senate Committee on Governmental Affairs  
House Committee on Appropriations  
House Subcommittee on National Security, Committee on Appropriations  
House Committee on Government Reform and Oversight  
House Subcommittee on National Security, International Affairs, and Criminal  
Justice, Committee on Government Reform and Oversight  
House Committee on National Security

## **Part III - Management Comments**

# Under Secretary of Defense (Comptroller) Comments



COMPTROLLER  
(Program/Budget)

OFFICE OF THE UNDER SECRETARY OF DEFENSE  
1100 DEFENSE PENTAGON  
WASHINGTON, DC 20301-1100



JAN 26 1996

MEMORANDUM FOR OFFICE OF THE DEPARTMENT OF DEFENSE INSPECTOR  
GENERAL (DIRECTOR, CONTRACT MANAGEMENT  
DIRECTORATE)

SUBJECT: FY 1996 Defense Mapping Agency (DMA) Military Construction Project to Replace  
Damaged Facilities and Consolidate Printing and Distribution Functions

We have reviewed the subject audit along with additional data provided by the Defense Mapping Agency (DMA) and agree that the proposed facility is overpriced by approximately \$7.0 million since scope reductions to the facility were not accompanied by corresponding cost reductions. Accordingly, we concur with your recommendation that the design plans for the project be revised to bring costs per square foot in line within standard cost estimates for a facility of this type and size.

As a result, we will release \$33.3 million for DMA's FY 1996 printing and distribution plant project, with obligation contingent on enactment of authorizing legislation and the redesign of the project.

My staff will continue to work with your office and DMA to resolve any issues concerning this project.

RONALD A. DAVIDSON  
DEPUTY COMPTROLLER  
(PROGRAM/BUDGET)

# Defense Mapping Agency Comments



## DEFENSE MAPPING AGENCY



D/CM

0 8 DEC 1995

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING,  
DEPARTMENT OF DEFENSE

SUBJECT: Audit Report on Military Construction of the  
Defense Mapping Agency Printing and Distribution  
Plant, St. Louis, Missouri (Project No. 5CG-  
0055.02)

Reference: DMA memorandum, 1 December, subject as above  
(Enclosure 1).

1. As promised in the referenced memorandum, enclosure 2 provides the Defense Mapping Agency's final comments on the subject draft audit report. Enclosure 2 summarizes our response to the DODIG and includes point-by-point comments on the recommendations and text of the report. We appreciate assurances by your staff that we will proceed immediately to adjudication at the DEPSECDEF level. Please inform us of the schedule for the adjudication.

2. Should you require additional information, please consult my Deputy, Laura Snow, at (703) 285-9206.

*Cynthia K. Bogner*

2 Enclosures a/s

Cynthia K. Bogner  
Comptroller

cc:  
USD(C)  
ASD(C3I)  
DASD(I)



DEFENSE MAPPING AGENCY



1 DEC 1995

D/CM

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING,  
DEPARTMENT OF DEFENSE

SUBJECT: Audit Report on Military Construction of the  
Defense Mapping Agency Printing and Distribution  
Plant, St. Louis, Missouri (Project No. SCC-  
0055.02)

References: a. Director, Contract Management Directorate,  
DoD IG memorandum, 22 November 1995, subject as  
above.

b. Secretary of Defense memorandum, 18 September  
1993, subject: "Department of Defense Internal  
Audit Decision and Followup Process."

1. This memorandum acknowledges receipt of the subject report on 27 November 1995 regarding the audit of the Defense Mapping Agency's appropriated FY 1996 military construction project to replace facilities destroyed by the 1993 Mississippi River floods. It also provides an interim response to the draft findings and recommendations of the report. A final response will follow shortly.

2. I was surprised to discover that the audit report has not changed materially since the working draft. For this reason, I continue to non-concur with the findings and recommendations of the report. The audit report continues to present factually incorrect and misleading information, despite repeated attempts at correction by this Agency. It implies both a lack of substantive analysis and a lack of cooperation by DMA, while overlooking crucial documentation we provided in conformance with formats agreed to by your audit team. The report also fails to reference corroborating documentation provided by impartial engineering experts of the U. S. Army Corps of Engineers and the Office of the Deputy Assistant Secretary of Defense (Installations).

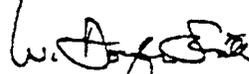
3. Most significantly, I was greatly surprised that the report continues to suggest that redesign of the facility would yield potential savings of \$7 million, although it provides no "auditable" evidence to substantiate that claim. The alleged savings ignore the substantial cost of a complete facility redesign, estimated at \$2 million. The alleged savings are based on application of naval facility guidelines that are not appropriate to this project, and include some design features

already eliminated from the final design. Further, the alleged savings fail to consider the staggering opportunity costs of halting a fully appropriated project at the 100 percent design stage. Opportunity costs alone exceed \$1 million per month, commencing with any delay in the scheduled land acquisition beyond 21 December 1995.

4. The report inappropriately dismisses opportunity costs by stating that "DMA is mandated to reduce personnel whether it moves or not." However, the programmed 243 work year savings made possible through this project are integral to DMA's strategy of drawing down while sustaining support to military operational readiness. If the project is delayed, DMA would be unable to fully achieve targeted work year reductions, since the alternative would be untenable service degradation undermining U.S. combat readiness. DMA would have to finance the work years through other direct program reductions. Such offsets potentially increase military operational risk. DMA is today supporting 14 ongoing military operations worldwide in which 25,000 U.S. troops are engaged, as well as preparing to support another 20,000 troops for Bosnian peace enforcement.

5. In reference b., the Secretary of Defense directed that "timely decisions on audit findings and recommendations are necessary to ensure management actions are not needlessly deferred." I support the Secretary's directive and therefore request we proceed immediately to adjudication, with the goal of resolving these issues by 21 December 1995.

6. I have asked my Comptroller to forward specific comments on the individual recommendations. You will receive these shortly. Until then, should you require additional information, please consult my Deputy Comptroller, Laura Snow, at (703) 285-9206.

  
W. DOUGLAS SMITH  
Deputy Director

cc:  
USD(C)  
ASD(C3I)  
DASD(I)

DEFENSE MAPPING AGENCY  
SPECIFIC COMMENTS ON DRAFT AUDIT REPORT ON  
MILITARY CONSTRUCTION OF THE DEFENSE MAPPING AGENCY  
PRINTING AND DISTRIBUTION PLANT, ST. LOUIS, MISSOURI  
(PROJECT NO. 5CG 0055.02)

SUMMARY

1. Attached to this summary are comments on recommendations contained in the draft audit report. DMA's comments on the two major recommendations point out the following:

a. DMA has already conducted site survey studies/economic analyses on the four alternate sites addressed in the draft audit report. The site surveys/economic analyses indicate that the selected site in Arnold, Missouri, is by far the most economical alternative.

b. The cost estimate for the facility has been thoroughly reviewed and approved by the Army Corps of Engineers, Cost Engineering Section, and was found to be "...accurate and appropriate for the scope of this project."

2. Enclosure 1 to DMA's comments are the four site survey studies/economic analyses which show that the alternative sites recommended by the DoDIG are more costly than the selected Arnold, Missouri, site.

3. Enclosure 2 is a Memorandum from the Director for Energy and Engineering, Office of the Assistant Secretary of Defense for Economic Security. The memorandum advises the DoDIG that 1) Military Handbook 1010A is not applicable to DMA, 2) the design is appropriate and does not appear to be overly plush, and 3) lost productivity improvement resulting from resiting the project would dwarf any savings in land acquisition or scope reduction.

4. Enclosure 3 is a Memorandum from the Corps of Engineers, Kansas City District, which validates that the current cost estimate for the project is accurate and appropriate for the scope of the project.

DEFENSE MAPPING AGENCY  
SPECIFIC COMMENTS ON DRAFT AUDIT REPORT ON  
MILITARY CONSTRUCTION OF THE DEFENSE MAPPING AGENCY  
PRINTING AND DISTRIBUTION PLANT, ST. LOUIS, MISSOURI  
(PROJECT NO. 5CG 0055.02)

1. The following comments are provided regarding recommendations contained in the draft audit report:

a. Recommendation A.1.a. The Director, DMA, perform thorough and auditable economic analyses of available Federal land and facilities in the St. Louis area to determine the most economical site and facility for the DMA printing and distribution plant.

DMA Response. Non Concur. To ensure that the selected site remains the most economical location for DMA's Military Construction project, DMA, in concert with the Corps of Engineers, Kansas City District, conducted site survey studies/economic analyses on the four alternate sites that became available either through the BRAC process or through identification by the DoDIG during their audit (see Enclosure 1). The site surveys were in conformance with the "Scott AFB Mystic Star" survey format agreed to by the DoDIG audit team. Economic analyses were performed using standard "ECONPACK" software used by the Corps of Engineers for evaluating alternatives in support of Military Construction projects. The surveys and associated economic analyses were provided to the DoDIG audit team. The analyses indicate that the selected site in Arnold, Missouri, is by far the most economical alternative.

b. Recommendation A.1.b. The Director, DMA, place the project on hold until the economic analyses are completed.

DMA Response. Non Concur. As indicated above, DMA has provided the DoDIG audit team with site surveys/economic analyses of identified sites which indicate that the Arnold site remains the most economical alternative. Pursuing any alternative to the Arnold site will entail complete facility redesign costing approximately \$2 million. More significantly, the delay of 12-18 months in this project will cost \$1 million per month in opportunity costs. The project is fully appropriated, at the 100 percent design stage, and announced for construction bids. Any delay at this late stage enhances risk that the Agency will not meet its planned consolidation schedule and will not be able to achieve targeted work year reductions. The Director for Energy and Engineering, Office of the Assistant Secretary of Defense for Economic Security, has advised the DoDIG against relocation of the facility, stating "Unless there is some compelling reason to have the facility located at Scott AFB, other than to avoid land acquisition, I would not concur in

## Defense Mapping Agency Comments

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Final Report  
Reference

deferring the project" (see Enclosure 2). The Director for Energy and Engineering has further indicated that "lost productivity improvement" (caused by a delay in resiting the project) "would dwarf any savings in land acquisition or scope reduction."

c. Recommendation A.2. The Under Secretary of Defense, Comptroller, suspend the \$40.3 million FY 1996 military construction funds for the new DMA printing and distribution plant until the DMA completes the economic analyses to determine the most economical site and facility for its printing and distribution mission.

DMA Response. Non Concur. As stated above, withholding funds is unwarranted since DMA, in concert with the Corps of Engineers, has already performed site surveys/economic analyses on alternative sites to determine the least costly alternative. The analyses indicate that the costs of pursuing any of the alternative sites far exceed the cost of the current Arnold site. As an example, the cost of the selected Arnold, Missouri, site is \$40 million. The costs of the closest alternatives, the Melvin Price Granite City and Army Ammunition Plant sites, are \$55 million and \$57 million, respectively. (The cost of the Melvin Price site was originally estimated at \$49 million; however, as DMA informed the DoDIG, this estimate was increased by \$6 million to correctly reflect sequential performance of environmental assessments and redesign, consistent with scheduling provided by the Corps of Engineers.)

d. Recommendation B.1. The Director, DMA, revise the facility design requirements for the proposed printing and distribution plant to stay within costs specified for primary facilities in Military Handbook 1010A, "Cost Engineering: Policy and Procedures," August 8, 1992.

DMA Response. Non Concur. The use of the outdated Military Handbook 1010A as a retroactive check against actual facility costs is inappropriate and inaccurate. The Director for Energy and Engineering, Office of the Assistant Secretary of Defense for Economic Security, has advised the DoDIG audit team that Military Handbook 1010A is a Naval Facilities Engineering Command document and not applicable to DMA (see Enclosure 2). The Corps of Engineer's Computer Aided Cost Estimating System provides a more encompassing and current database of construction costs. The cost estimate provided with the 95 percent design has been thoroughly reviewed and approved by the Army Corps of Engineers, Cost Engineering Section, using the Computer Aided Cost Estimating System and has been found to be "...accurate and appropriate for the scope of this project." (see Enclosure 3).

Deleted

e. Recommendation B.2. The Director DMA, delete the rooftop terrace, exercise room, and administrative locker and shower room from design plans for the printing and distribution plant in St. Louis, Missouri.

DMA Response. Partially Concur. In DMA's 3 October 1995 response to the audit team's working draft, DMA advised the DoDIG that the rooftop was identified by DMA as an extravagance that had evolved within Parson's Main, the architect for the project, and that it was redesigned to be minimally finished as a walkout area.

DMA non-concurs regarding the deletion of the exercise room and accompanying administrative locker and shower room. As part of DMA's union agreement, we are required to provide press room employees with uniforms and a changing/locker area for employees to change soiled clothes at the end of the work day. It is also prudent and common sense to provide showers at industrial facilities such as DMA where chemicals are used. The locker and shower area would be necessary regardless of the exercise room. In addition, FPM letter 792-15, as authorized by Section 7901 of Title 5 U.S.C., authorizes agencies to establish health services programs to promote and maintain the physical and mental fitness of their employees. This includes the establishment and operation of physical fitness programs and facilities designed to promote and maintain employee health.

2. Included below are DMA comments pertaining to specific information provided in the text of the draft audit report. In many cases, the DoDIG report presents partial information, ignoring clarifying information provided in previous correspondence.

a. Page 1, paragraph 4: "The Defense Mapping Agency overlooked potential Government sites and existing Government buildings that should have been considered when planning a new site and new construction for a printing and distribution plant in St. Louis, Missouri."

DMA Response: Over a period of five months, DMA considered all potential government sites in the St. Louis, MO, area when searching for a location for the proposed printing and distribution facility. Only after all government sites were evaluated and rejected due to size, economics, environmental contamination, and flooding considerations, did DMA consider commercial sites as an alternative for the printing and distribution facility. As prudent managers, DMA continued to consider government sites which became available to determine if any were economically more feasible than the selected Arnold site.

Renumbered as B.1. Revised in final report to include "deletion of the interior courtyard and exhibit area and reduce lobby size."

Deleted

## Defense Mapping Agency Comments

Final Report  
Reference

Deleted

DMA recently performed site surveys/economic analyses of the Scott AFB, Army Ammunition Plant, Melvin Price Support Center and GSA Goodfellow sites identified by the DoDIG as potential alternative sites, some of which had already been reviewed and rejected by DMA due to cost and other considerations. The analyses indicate that the selected site in Arnold, Missouri, is by far the most economical alternative.

b. Page i, paragraph 5: "The plans for the printing and distribution plant contained features that caused the cost per square foot to exceed the Military Handbook 1010A primary facility guidance costs."

DMA Response: The cost estimate provided with the 95 percent design has been thoroughly reviewed by DMA's design and construction agent, the Army Corps of Engineers, Cost Engineering Section, and has been found to be "...accurate and appropriate for the scope of this project," and "...in accordance with the Corps of Engineer's Computer Aided Cost Estimating System."

The DoDIG incorrectly estimated \$7 million in excessive primary facility costs by comparing the 95 percent facility design cost to Military Handbook 1010A Cost Engineering, Policy and Procedures, August 1, 1992. The use of the Military Handbook 1010A as a retroactive check against actual facility costs is an inappropriate application of these guidelines. Page iii of the subject handbook specifically cautions:

***"This handbook is intended to be a cost estimate preparation and review guide, and should not be used exclusive of full consideration of scope, additional functional features, and supporting facilities."***

The scope and features of this unique state-of-the-art facility, which includes an electronic customer gateway to DMA's digital geospatial archives, are not covered by standard reference sources and should have been factored in by the DoDIG. The DoDIG admits in the draft audit report that "...it is not unusual for construction estimates based on design to exceed the estimates provided by Military Handbook 1010A...." The cost of the project reflects actual scope requirements for the DMA mission.

c. Page ii, paragraph 1: "Our review of management controls determined that DMA had not included the military construction program as an assessable unit in its management control program."

DMA Response: While this is true, the Executive Summary should include the DoDIG's statement found in Appendix A of the report; i.e., that DMA did not include the MILCON

Revised,  
page ii,  
paragraph 2

process as an assessable unit because DMA has not been responsible for military construction in the past, and that the DoDIG does not consider that omission to be a weakness.

d. Page ii, paragraph 2: "The total potential savings from this report will be determined after DMA completes thorough and auditable economic analyses on potential sites to determine whether existing Federal land or facilities are available."

Deleted

DMA Response: DMA has already completed economic analyses of the four sites identified by the DoDIG as potential relocation sites and found that the Arnold site remains the most economically justified option. The format DMA used for these economic analyses was agreed to by the DoDIG. It presented the same level of thorough and auditable detail as independent generic cost estimates provided to the DoDIG audit team by the Corps of Engineers.

Page 4,  
paragraph 2

e. Page 4, paragraph 3: "The DMA survey of Government land and facilities was performed from August 1993 through January 1994 and was based on requirements for a 570,000-square foot building."

DMA Response: Inaccurate statement. The survey was for a site at 418,500 gross square feet. It is true that DMA initially estimated replacing the facilities lost from the flood in identical square footage (570,000 lost; initial FY 1995 DD 1391 represented 570,000 GSF). However, this estimate was revised downward within a three-month period after the flood.

f. Page 5, paragraph 2: "Change in Project Size."

DMA Response: In planning for a replacement facility, DMA continued to refine the requirements for this project to fully execute the mission while remaining within budget. When it became apparent that the project would cost more than the \$40.3 million dollars budgeted for the project, DMA convened a Facilities Working Group to refine requirements for the facility in order to remain within budget. In reducing the physical footprint for the building, DMA has not in any way reduced the mission that is intended for the building. Through this process, DMA has provided a more cost-efficient facility that meets the needs of the Department of Defense in providing global geospatial mapping information and services. The analysis DMA performed is consistent with the intent of DoD Directive 7041.3, Economic Analysis and Program Evaluation for Resource Management; i.e., to conduct continuous management reviews of cost and effectiveness of resource requirements for proposed and ongoing activities. The alternative to reducing the physical footprint to stay within budget would have been to request additional funding to pay for a larger than needed

Revised  
pages 4-5

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Reference

Page 5,  
paragraph 1

building. DMA considered this alternative to be a disservice to the American taxpayer.

g. Page 5, paragraph 3: "DoD Directive 7040.4, Military Construction Authorization and Appropriation," March 5, 1979, requires continued surveillance of existing facilities that can be jointly utilized, converted, or altered to satisfy new requirements or acquired and adapted to military use at minimum construction cost."

DMA Response: DMA has continued to search for available land and/or facilities. This fact has been documented by the studies we have conducted and provided to the DoDIG during their investigation. To ensure that the selected site remains the most economical location, DMA recently performed site surveys/economic analyses on sites which have become available through the BRAC process or through identification by the DoDIG. The analyses indicate that the selected site in Arnold, Missouri, remains the best economic alternative.

Page 5,  
paragraph 2

h. Page 5, paragraph 4: "DoD Directive 7041.3, Economic Analysis and Program Evaluation for Resource Management," October 18, 1972, requires continuous management reviews of cost and effectiveness of resource requirements for both proposed and ongoing activities." "Using costs to compare the relative merits of alternatives aids in making trade-offs between alternatives, recommending the most cost-effective alternative, and establishing or changing priorities."

DMA Response: In line with DoD Directive 7041.3, DMA continuously reviewed the costs of the construction project and reduced the physical footprint for the building. Through this process, DMA has provided a more cost-efficient facility that meets the needs of the Department of Defense.

Revised,  
page 5,  
paragraph 3

i. Page 5, paragraph 5: "The change in project size from 570,000 to 256,000 square feet, a 55 percent reduction, was significant and, therefore, warranted further study of available Government land and facilities."

DMA Response: DMA continued to look for space even though there was no change in project scope. The mission did not change, nor did the number of personnel assigned, site requirements, or volume of storage in the warehouse. There was still a requirement for employee parking, government vehicle parking, a water storage tank, retention basin and truck loading dock area. All of these items required physical space on the site that did not change. The reduction in physical footprint of the building from 418,500 (not 570,000), to 256,000 only equates to 3.73 acres. Re-siting with an attendant requirement of new architectural plans and specifications at a cost of \$2

million dollars, as well as the substantial opportunity costs of delay, are not prudent investments to defray a land cost of \$93,000 (3.73 x \$25,000/acre).

j. Page 6, paragraph 1: "Army Aviation and Troop Command."

Page 5,  
paragraph 5

DMA Response: It is unclear as to why the DoDIG has listed this site as a possible alternative to pursue. DMA demonstrated that the total costs for pursuing this alternative were close to \$65.0 million. DMA provided the DoDIG with a detailed breakdown of the costs associated with modifying this site for DMA use, line item by line item down to the one million dollar range. This study was an order-of-magnitude study, covering a 5-10 day process, and was used to determine if additional study was warranted. At \$65 million, this alternative far exceeded the selected alternative costing \$40 million and didn't warrant further consideration.

k. Page 6, paragraph 3: "Scott Air Force Base."

Page 6,  
paragraph 1

DMA Response: On two consecutive phone calls to the real estate specialists at Scott, no land or facilities were available during our initial site search. When this site became available in September 1995, DMA conducted an economic analysis of the site in conjunction with the Kansas City Corps of Engineers on 29 Sept 1995. The analysis found that while the site had potential as a development site, the cost of this alternative was \$64 million.

l. Page 6, paragraph 4: "Charles Melvin Price Support Center."

Page 6,  
paragraph 2

DMA Response: As previously mentioned, DMA recently performed a site survey/economic analysis on the Melvin Price Support Center (Granite City). The analysis indicated that this alternative would cost \$55 million, in contrast to the selected alternative of \$40 million.

The Melvin Price Support Center (Granite City) was ruled out early in DMA's initial site search due to its location in the floodplain. DMA does not believe it misinterpreted Military Handbook 1190 or Executive Order 11988 in rejecting the site due to its location in a flood plain. While the levee held during the Great Flood in 1993, the installation experienced hydrostatic flooding and the two drainage lagoons had to be drained as a stop-gap measure to prevent flooding on the site. In conversations with the St. Louis Corps of Engineers (Anson Eichorst, 314-331-8016) DMA learned that the \$43.0 million dollar maintenance project is to bring the 1930's-vintage levee up to modern engineering standards. The Corps is recommending to Congress a maintenance project to correct deficiencies and

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problems that developed on the site during the Great Flood of 1993.

The probability of another flood in St. Louis is fairly certain. Putting a critical DoD facility that supports the warfighter during crisis operations in a floodplain is not a smart management decision.

Page 6,  
paragraph 2

m. Page 6, paragraph 4: "The Charles Melvin Price Support Center is located on a 500-year floodplain..."

DMA Response: Inaccurate statement. The Melvin Price Support Center is located in the 100-year floodplain. It sits adjacent to the Mississippi River. When DMA contacted Mr. Richard Becht, the facilities maintenance chief at Melvin Price, to verify this information, he confirmed that the site is in the 100-year floodplain.

Page 6,  
paragraph 3

n. Page 6, paragraph 5: "St. Louis Army Ammunition Plant."

DMA Response: To determine the cost of this alternative, DMA recently performed a site survey/economic analyses of the St. Louis Army Ammunition Plant. The analysis indicated that this alternative would cost \$57 million.

The DoDIG was provided the engineering analysis that described the condition of the facilities at this installation, and the Notice of Violation from the EPA concerning the PCB contamination in Bldg. 3. The site is too small, at only 21 acres, to accommodate employee and government parking, loading docks, and turn-around space for truck traffic. The three buildings referenced by the DoDIG would not meet our requirements even without the PCB contamination. The floor to ceiling height is approximately 10 feet, and the column spacing is 20 feet on center. In contrast, the proposed P&D facility has a requirement for column spacing of 30 feet, with a floor-to-ceiling height of 28 feet. Column spacing at 20 feet would limit the use of our material handling equipment and be extremely difficult to locate our printing presses between columns. The floor-to-ceiling height of the ammunition plant is restrictive both for the press area and for the warehouse. This floor-to-ceiling height would only allow limited stacking of material, and stacking at this height would increase our requirement threefold. The DMA requirement of 256,000 gross square feet is predicated on a facility that is specifically designed for DMA use, with equipment and functions dictating the space configuration, rather than the building configuration dictating where equipment can be located.

In summary, this site was rejected due to many reasons, not just its incompatibility with the initial square footage

A

requirement. It was rejected due to the high cost to renovate, PCB contamination, size, restrictive floor-to-ceiling height, and column spacing.

o. Page 7, paragraph 1: "The decision to purchase land and construct a new building in the St. Louis area when vacant land and buildings were available in the same geographic area was not commensurate with guidance from the Office of the Secretary of Defense."

Page 6,  
paragraph 4

DMA Response: As we have already indicated, DMA considered all available federal sites during the initial site search and continued to consider federal sites even after site selection. Vacant land and buildings now proposed by the DoDIG for consideration have been evaluated by DMA, in concert with the Corps of Engineers, and were found to be more costly than the selected site in Arnold, Missouri. As we have demonstrated, the additional design costs and opportunity costs associated with selecting an alternative site far exceed any cost advantages to be gained by moving the function to an existing government site.

We concur with the BRAC Commission, as stated in the draft audit report, that the DoD physical infrastructure should be reduced commensurate with the DoD downsizing. Through this initiative, DMA is reducing its physical plant inventory by nearly one million square feet.

p. Page 7, paragraph 3: "Although DMA planners sought and reviewed information on available Federal land and facilities, the search was based on requirements for a 570,000 square foot facility."

Page 7,  
paragraph 1

DMA Response: As previously indicated, the 570,000 GSF requirement was only represented during the first couple of months after the flood. 570,000 should be replaced with 418,500. DMA has consistently held that the requirements definition was an iterative process, whereby we continued to look for ways to provide a more cost efficient facility. The alternative would have been to continue to represent a facility with a much higher cost to the DoD and to the taxpayer.

q. Page 7, paragraph 3: "Additionally, previously rejected sites and facilities had further potential after DMA reduced the project size to 256,000 square feet..."

Page 7,  
paragraph 1

DMA Response: The reduction was in the facility footprint, NOT SCOPE. The reduction in facility footprint equates to 3.73 acres. It is not reasonable to recommend resiting of the facility based upon a figure as small as 4 acres.

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Deleted

r. Page 7, paragraph 5: "For each site survey, the approach of the DMA planners seemed to be to determine why each site could not be considered rather than how the sites could be used. DMA could not provide support or documentation for the cost estimates contained in the site surveys."

DMA Response: The DoDIG's comment regarding DMA's approach to conducting site surveys is subjective, without basis, and simply wrong. DMA initiated the site surveys in good faith to determine if there was a better alternative to selected site. These site surveys were in conformance with formats agreed to by the DoDIG audit team and were presented in the same level of thorough and auditable detail as independent generic cost estimates provided to the DoDIG audit team by the Corps of Engineers.

Revised,  
page 7,  
paragraph 3

s. Page 7, paragraph 6: "Including costs in cost analyses is not appropriate because DMA is mandated to reduce personnel whether it moves or not."

DMA Response: The programmed 243 work year savings made possible through this project are integral to DMA's strategy of drawing down while sustaining support to military operational readiness. A delay in the project caused by resiting the facility would result in DMA being unable to achieve targeted work year reductions without direct program reductions which would impact DMA's support to U.S. combat readiness.

Revised,  
page 13,  
paragraph 2

t. Page 9, paragraph 2: "Military construction cost estimates are usually prepared by using square foot costs contained in Military Handbook 1010A." "DMA planners used Military Handbook 1010A to prepare its third DD Form 1391 budget submission, dated September 9, 1994."

DMA Response: Military Handbook 1010A is a Naval document and other agencies are not required to follow the procedures outlined in the manual per the Director for Energy and Engineering, Office of the Assistant Secretary of Defense for Economic Security. Military Handbook 1010A is an outdated (1 August 1992) Naval Facilities Engineering Command handbook to be used primarily at naval shore facilities in the purchase of facilities engineering studies and design. As previously indicated to the DoDIG, DMA applied guidance required by USD (Conservation and Installations) memorandum, 20 August 1993, subject: "Area Cost Factors and Unit Prices for FY 1996-1997 Department of Defense Facility Construction," in preparing DD 1391 budget estimates for Military Construction Projects.

Deleted

u. Page 9, paragraph 2: "DMA planners stated that documentation supporting the \$30.2 million estimate had been destroyed, but indicated that the estimates were based on

primary facility guidance costs for administrative, warehouse, and printing space."

DMA Response: This statement is incorrect. DMA indicated to the DoDIG that unofficial working papers were updated/replaced when square footage requirements were refined and a new DD 1391 was developed. The official DD 1391 supporting the 340,000 square feet requirement was provided to the DoDIG during the audit. References to DMA destruction of working papers, and the attendant inference of wrong-doing, are unwarranted and should be deleted.

The USD memorandum, 20 August 1993, subject: "Area Cost Factors and Unit Prices for FY 1996-1997 Department of Defense Facility Construction," includes unit costs for administrative and unheated warehouse, but not for printing, bindery, production space, electronic customer gateways and conditioned warehouse. DMA planners utilized the closest fit between the DMA requirement and the unit costs identified in this memorandum, recognizing that it was an estimation based upon knowledge of other Military Construction projects and the DMA requirement. The intent of the USD memorandum is for guidance in preparing a DD 1391, not as an audit mechanism for actual projects.

v. Page 10, paragraph 1: "Site improvements were increased by \$700,000 so the overall estimated cost for the project remained at \$40.3 million."

Deleted

DMA Response: It should be noted that the increased cost of the site improvements identified from the previous estimates does not result from amenities, but rather from mission essential requirements. These include specifically a water storage tank, an underground fuel storage tank, electrical transformers, and a hazardous waste storage tank. These items were identified as essentials after detailed discussions with the utility companies.

w. Page 10, paragraph 1, and Page 10, table (indicated by an asterisk): "DMA planners could not provide the actual square feet planned for warehouse or printing space and were not aware of the individual costs per square foot for administrative, printing, or warehouse space." "DMA planners could not provide exact square feet planned for printing and warehouse space."

Deleted

DMA Response: It is unclear as to why the DoDIG states that DMA could not provide exact square footage for the facility. DMA provided to the DoDIG a detailed set of blueprints for the new facility, as well as a summary breakdown of the square footage. If there is any confusion in discerning the space allocated per function, it is because warehouse and printing spaces are contiguous, with no delineated boundary between them. The reengineering of

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the printing and distribution functions allowed DMA to overlap functions, and consequently provided for space efficiencies not previously available.

Page 14,  
paragraph 1

x. Page 10, paragraph 3: "The project costs should have been about \$22.5 million according to the calculation in the table. That \$22.5 million estimate is \$7 million less than the \$29.5 million projected by DMA in the February 1995 DD Form 1391."

DMA Response: As we have previously indicated, Military Handbook 1010A has been used inappropriately. In addition, the cost information used by the DoDIG in comparing the unit costs of the facility against the unit costs cited in Military Handbook 1010A is inaccurate. As an example, the administrative area in the DMA facility includes computer space with raised flooring, 24 hour environmental control, and emergency power. A unit cost of \$87 does not reflect an appropriate amount. The printing area includes space with special foundations, environmental control, sound attenuation and a dust mitigation system. A unit cost of \$108 for this type of space is also totally inappropriate. The \$47 unit cost cited for warehouse space is for low bay storage, unheated warehouse, whereas the DMA warehouse has increased floor loading due to high bay storage and provides conditioned air due to the sensitivity of the material being stored. In addition, due to the high volume of paper stored in the warehouse, the sprinkler coverage is higher than found in other warehouses. \$47 is not an appropriate amount for space of this kind.

Page 11,  
paragraph 2

y. Page 11, paragraph 1: "The DMA printing and distribution plant was designed with the appearance of a headquarters building, necessitating higher costs of construction than appropriate for an industrial printing and distribution plant. MILCON funds that originally were needed to construct a larger building may have been applied to design features that were not needed in a facility such as the one planned."

DMA Response: These statements are entirely subjective, have no basis in fact, and should be deleted from the report. In addition, the Director for Energy and Engineering, Office of the Assistant Secretary of Defense for Economic Security, has advised the DoDIG that "It is a matter of judgment, but we believe the design is appropriate and does not appear to be overly "plush."

Page 11,  
paragraph 4-5

z. Page 11, paragraphs 3 and 4: "Lobby and Exhibit Areas" and "Interior Courtyard."

DMA Response: The DoDIG has concluded that the project costs more than it should, at \$7.0 million dollars. However, the DoDIG indicates that two to three additional

floors could be provided rather than the lobby and interior courtyard. This would increase the building by 36,700 square feet at a cost of \$3.1 million dollars. (\$87(5,200 + 31,500)).

As designed, this space serves an important function in providing natural light to the interior spaces. DMA has calculated that the natural light can reduce the amount of foot-candles (fc) to be provided in the interior space by approximately 40fc. This reduces first cost in that the additional overhead lights do not need to be provided, as well as reduces energy consumption costs over the many years DMA will occupy the building.

aa. Page 11, paragraph 5: "Exercise Room and Showers."

DMA Response: FPM letter 792-15, as authorized by Section 7901 of Title 5 U.S.C., authorizes agencies to establish, within the limits of appropriations, health services programs to promote and maintain the physical and mental fitness of their employees. This includes the establishment and operation of physical fitness programs and facilities designed to promote and maintain employee health. In addition, as part of DMA's union agreement, we are required to provide press room employees with uniforms and a changing/locker area for employees to change soiled clothes at the end of the work day. It is also prudent and common sense to provide showers for industrial facilities where chemicals are used. Locating the showers near the exercise room negated the need to provide two shower facilities.

bb. Page 11, paragraph 6: "Rooftop Terrace."

DMA Response: The rooftop terrace as represented on the 65% plans provided to the DoDIG was identified by DMA as an extravagance that had evolved within Parson's Main, the architect for the project. It was not directed or requested by DMA in the form in which it appeared. The rooftop terrace has been redesigned and will be minimally finished as a walkout area.

Revised,  
Pages 11-12

Page 12,  
paragraph 2

**Consolidated Melvin Price Support Center (CMPSC)  
Granite City, Illinois**

**MFR:** 12 October 1995

Site Survey Conducted by: Mary Ellen Seale, DMA(PA)  
Rich Flauaus, DMA(IMEF)  
Craig Robillard, KC Corps of Engineers

**Location:** The installation is located approximately 5 miles from downtown St. Louis, across either the McKinley Bridge that is in very poor condition, or the Bernard F. Dickman (Poplar) bridge.

**Mission:** The installation was originally an Army warehousing depot in support of World War II. The current mission of the site is to provide storage and housing for various military and federal government agencies. Until early 1995, CMPSC was under the command of ATCOM (Army Troop Command) located in St. Louis. The site currently contains approximately 26 tenants, several warehouses, a strategic materials stockpile, and military family housing. In 1991 and in 1995, the site was listed on the BRAC closure list, however, the site has since been removed from the 1995 list, even though ATCOM in St. Louis will be relocating. No command has been identified at this time as the commander of the installation, however, base personnel indicated that in all likelihood it would probably be the Army Material Command. The installation also supports the municipal sewage treatment facility that services all of Granite City. The system is a combined sanitary and storm system and is discharged upon treatment into the Mississippi.

**Site Size and Configuration:** The installation identified two possible sites for consideration. Site A is located adjacent the warehouses in the middle of the installation and comprises 3 parcels, each 10 acres in size. The parcels are 300 x 1500 feet and are separated by roads and utilities. The parcels were originally configured in this manner for warehouses. Combining all three parcels into one contiguous parcel would provide a square site at 30 acres. One of the parcels contains an elevated 200K gallon water storage tank. Additional land adjacent these parcels may be available if needed.

Site B is located at the rear access gate and is also squarely shaped. It contains approximately 35 acres.

**Transportation:** The installation can be reached from five major bridges, Chain of Rocks, McKinley, Martin Luther King, Poplar Street and Jefferson Barracks. The McKinley bridge is in poor condition, and is currently undergoing a major repair project, which basically negates the use of this

bridge for the next several years. Both of the sites identified have poor to substandard asphalt roads which would need to be upgraded to handle the amount of traffic anticipated from the DMA facility. Site B has the ability of being serviced by a rear access gate. CMPSC planners stated that this entrance could be upgraded as the DMA entrance.

Site A has poor transportation access to it, since it is located in the middle of the compound, and the roads servicing this parcel are substandard in terms of level of service and their condition.

Utilities: Electric service to the main base substation is fed by two 3750 KVA, 3 phase connectors. Site A has all utilities available, however the parcels are subdivided by utility runs between parcels. Electrical service for Site A appears to be adequate and is located nearby. The elevated water tank located at Site A was provided to provide adequate fire flow, and it is assumed for this analysis that fire flow will be adequate to service the facility. The elevated water tank would limit the amount of land for development, as it sits in the center of one of the parcels. Gas, telephone and sewer are adjacent to the site.

Site B has limited utilities, an 8" water line, telephone and an 87 amp electrical service. However since this parcel abuts Neidringhaus Road, a major thoroughfare, water, gas, sewer and electric could probably be brought to the site.

Environmental: The base planner at CMPSC indicated that to his knowledge no environmental contamination exists at either of the sites, however a comprehensive environmental baseline survey was currently being planned for the base. Site B had previously been used as an airplane engine test facility, and currently is being utilized as a burn pit for trash and yard debris. The area located at Site A contained railroad tracks which has since been abandoned, and was used as a helicopter landing area. There is no other known use for Site A.

Development Issues: Both sites are located in the 100 year floodplain. During the site visit on 12 October 1995, the base planner did admit that he had previously misinformed the DoD IG in reporting that the installation is located in the 500 year floodplain. The levee is built to the 500 year floodplain level. Both sites are located at approximately the 412 foot elevation. The base planner indicated that during the 1993 flood, water reached within 5 feet of the top of levee. As indicated by the location of the sewage treatment facility, this site sits at the one of the lowest points in Granite City. During the flood of 1993, the sewage treatment plant outfall had to be shut down and the sewage diverted. Any breach in the levee could cause raw

sewage to flood the installation with the Mississippi flood water.

From a development standpoint, locating critical DoD facilities in the floodplain, is not wise land use planning. As indicated by the Galloway Task Force Study, 1994, U.S. Corps of Engineers, critical DoD facilities or hazardous storage facilities should not be located within the floodplain, whether protected from a levee or not. The risk to human life and property is just too great.

In addition the integrity of the levee is in question. Recent conversations with the St. Louis Corps of Engineers (see enclosed), the Corps plans to request funds to correct deficiencies and problems that have developed since the levee was constructed over 40 years ago. Even though the levee did hold during the 1993 flood, performance of the underseepage controls did not meet all of the design standards. Seepage caused by flood water is one thing, water seepage combined with raw sewage is a serious concern. Site A is located approximately 1200 feet from the sewage treatment facility. From a development standpoint, site A should be rejected for this reason.

Site B, although located nearly a mile from the sewage treatment plant, is located adjacent the levee, and has a lower elevation than the rest of the installation at the 409 feet. Access to Site B is ideal, with the opportunity to provide a direct access to the compound from the main thoroughfare, without having to drive through the installation to reach the site. Utility accessibility is a concern with limited existing utilities on site.

Costs: The costs provided assume that no environmental contamination exists on either site and that no remediation work would need to be accomplished. An environmental assessment would still need to be accomplished.

It is assumed that the primary costs of the original facility would be the same, along with some level of utility and road infrastructure. Site B would require upgrade of the rear entrance, roadwork and utility extension. Site A would require reconfiguration of the utility runs bisecting the 10 acre parcels, and roadwork. The timeline and preliminary costs needed are:

Environmental Assessment, \$40K, concurrent with design  
Borings and Geotechnical, \$60K, concurrent with design  
Design, \$2.0M, 12 months  
Site Development, \$3.0M - \$4.0M, concurrent with construction  
Construction, \$31.5M, 17 months

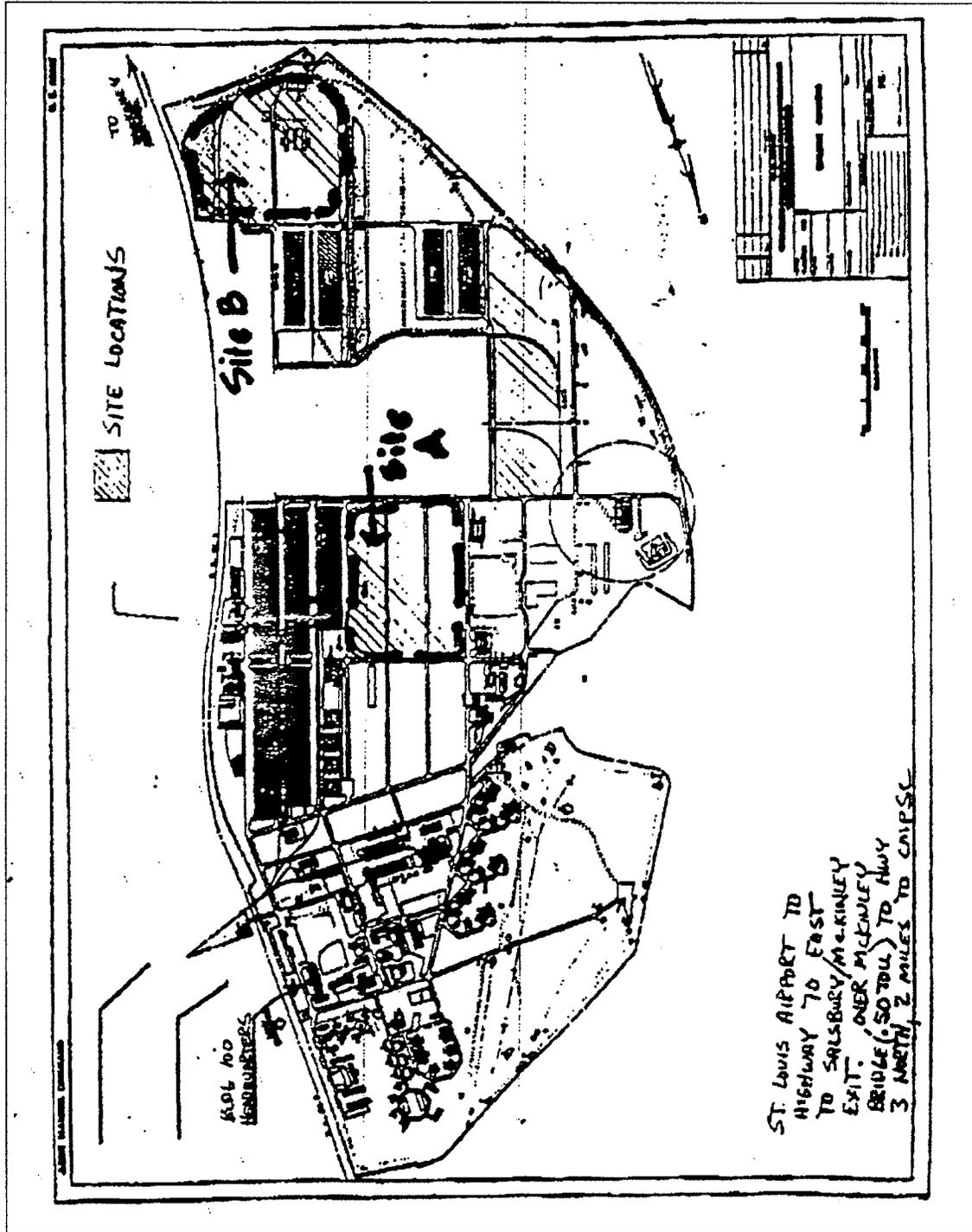
SUBTOTAL

\$36.6M - \$37.6M

Opportunity Cost of the Delay  
(12 months, assumes \$11.5M/yr) = \$11.5M

**Recommendation:** It is not recommended to pursue development of Site A or B at CMPSC due to the costs and location within the 100 year floodplain. Recent engineering literature questions the use of the floodplain for the siting of facilities, with or without levee protection. In addition, standard land use planning does not recommend siting facilities near a sewage treatment facility. Locating DMA's electronic gateway and total digital geospatial archives in a floodplain with the risk of flooding from the Mississippi and a sewage treatment facility, puts DMA and the DoD at risk. The facility that DMA plans to build will support crisis operations both with paper products and digital services.

Mary Ellen Seale, RLA  
General Engineer



**St. Louis Army Ammunition Plant (SLAAP) Site Analysis  
St. Louis, MO**

**MFR:** 10 October 1995  
Mary Ellen Seale

**Location:** The site is located approximately 5 miles from downtown St. Louis at the intersection of Interstate 70 and Goodfellow Boulevard. A diamond interchange is located at this intersection. The site is situated above the 100 year flood plain.

**Mission:** The site has been deactivated as of 1989. Originally, the site was used to produce ordnance in support of WW II. After the war, the plant was placed in standby status, and has been only activated two times, once for the Korean Conflict and for the Viet Nam war. Since 1989, the site has remained vacant, except for temporary storage for VA records and to house the Defense Metropolitan Area Telephone System (DMATS).

**Site Size and Configuration:** The site is approximately 21 acres, and contains six buildings. The site is rectangular, and contains a railroad track that bisects the site in two. The railroad track has since been abandoned. The site is fenced on all sides and one of the buildings has a small loading dock area. The center of the site contains an electrical substation. The site is relatively level. The existing land use consists of:

Administrative and Production Bldgs	13 acres
Parking Space and Streets	5 acres
Grass Area	3 acres
Utility Easements	1.6 acres

**Transportation:** The site has easy access from Interstate 70 and Goodfellow Blvd. Entrance to the site is located off of Riverview Blvd., which intersects Goodfellow Blvd. Riverview Blvd. is in fairly good condition and there is a signalized intersection at Riverview and Goodfellow.

**Utilities:** The site has good utilities, electrical service has ample capacity, at 80MVA, 34.5/13.8 KV with a Primary Substation. An electrical distribution system project was undertaken 1987, however, only one feeder line was installed. A split buss substation consists of two 40MV transformers with tie switches on both the primary and secondary sides. Natural gas, city water and public sanitary and storm sewer exist on site. The sewer is a combined sanitary and storm system.

**Environmental:** Basements of buildings 3, 5 and 6 all contain friable and nonfriable asbestos insulation on steam lines. Asbestos insulation is not accessible to the general

population. Wood block flooring in Building 3 on the first floor and the basement has contained PCB contamination. As of 10 October 1995, most of the PCB contamination has been removed, however, from conversations with the staff engineer (Mr. Gary Turner), there still remains several hot areas of contamination. Currently the site is under a NOV (Notice of Violation) from EPA due to the contamination in this building. It is ATCOM's hope that remediation efforts will be determined to be satisfactory to the EPA during the November 1995 timeframe and that the EPA will release the NOV even with the few remaining hot spots. ATCOM indicated that the goal is to release the site and begin excessing procedures for the site in Jan 1996.

Abandoned underground storage tanks were located at the plant, it is unclear whether these tanks have been removed, or have been abandoned in place.

Bldg 2 and 1 both contain transite siding which is made of asbestos. Bldg 2's floor to ceiling height is approximately 55', and the amount of asbestos siding covering a volume of 4.3 million cubic feet is significant. Removal or demolition of these facilities would require that the siding be treated as hazardous waste. At the moment this siding causes no health risk unless the integrity of the material is compromised and asbestos is released. In addition, our engineering studies indicated suspect oil spillage/staining in Building 2 that would need to be investigated.

Development Issues: The site is constrained from a development standpoint due to the location of the substation, railroad tracks and the location of the existing buildings on site. Parking would be limited given the amount of space needed for truck access, loading docks and turnaround. The site has one way in and out and there is limited roadway access between buildings. The site is primarily paved, with limited to no landscaped areas. Traffic enters the site into a paved area, with no areas delineated for parking, walkway, roadway or truck turnaround. At the present there is not enough available land for parking and loading dock area. Parking for 610 vehicles would use the entire 5 acres of available parking area and streets, with no other land for trucks. For this analysis it is assumed that Bldg 2 and 1 would be demolished to provide the needed additional land for truck turnaround and access. Additional land may need to be acquired for employee parking.

Operational Issues: Building 3, which could conceivably be used for the production and warehouse space, contains 20'x20' column spacing. This column spacing would be too narrow to allow efficient warehousing or process operations, and would result in a much greater floor space requirement. This spacing would not allow efficient and safe operation of

our material handling equipment. For comparison, column spacing at the DMA Arnold facility will be 30' x 30' and the Philadelphia Depot is 20' x 80'. Utilizing a facility with this type of restrictive column spacing would degrade the DMA mission.

In addition, Bldg 3 has floor to ceiling height of 12'. The warehouse portion of the Arnold facility consists of floor to ceiling height of 28'. The 256,000 square feet requirement for the Arnold facility is predicated on high bay storage. Restrictive floor to ceiling height would require DMA to be housed in a much larger facility.

Space Utilization: Space at the SLAAP consists of:

Bldg 3	322,780 GSF*
Bldg 5	21,517
Bldg 6	<u>20,302</u>
TOTAL	364,599

\*Basements, crawl spaces and penthouses not included. Bldg 4 is not included since it is a utility building.

The figure of 364,600 is not the actual net useable square footage for the compound. This figure includes restrooms, corridors, stairways and elevators. Assuming a 20% reduction in space due to these items, the actual amount of space available at the installation would be 304,000 NSF.

Considering the restricting nature of the floor to ceiling heights, it can be assumed that a much larger facility would be required. Utilizing a net to gross factor of 1.3, the DMA requirement at the SLAAP would be 395,200. Currently not enough space exists on the compound without approximately 100,000 square feet of new construction.

Costs: In order to develop the site, a determination would need to be made whether any additional environmental cleanup would need to be accomplished. Since Bldgs 1 and 2 would need to be demolished, the full costs of removing the asbestos and disposal at a specified landfill would need to be determined. DMA does not have the benefit of ATCOM's history on environmental studies or the full scope of the environmental work done on the site to date, however, since there is still some PCB contamination, it is safe to assume that some additional work would be necessary.

Rehabilitation/Scope Definition Study: After work is completed on the environmental survey, a study would need to be conducted on how to best utilize the buildings in their current condition, and what additional work would need to be accomplished. DMA and Army Personnel Command have completed Engineering Feasibility Studies to identify specific building deficiencies in terms of mechanical, electrical,

life safety, and other code violations. These studies are available for review.

The timeline and preliminary costs needed are provided below:

Environmental Assessment, Cleanup studies, 40K, 6 months  
Rehabilitation/Scope Definition study, 60K, concurrent  
Environmental Remediation, Unknown cost and time  
Design, \$1.7 M, 12 months  
Demolition of Building 1 & 2, \$1.5 M, 3 months  
Renovation (304,000@ \$65-\$75), \$18.2M-\$21.2M, 17 months  
Site Improvements, \$3.0M, concurrent  
New Construction (100K@ \$80/SF)\*\*, \$8.0M, concurrent

SUBTOTAL \$34.1M - \$37.1M

Opportunity Cost of the Delay  
(21 months, based on \$11.5M/yr) = \$20.1M

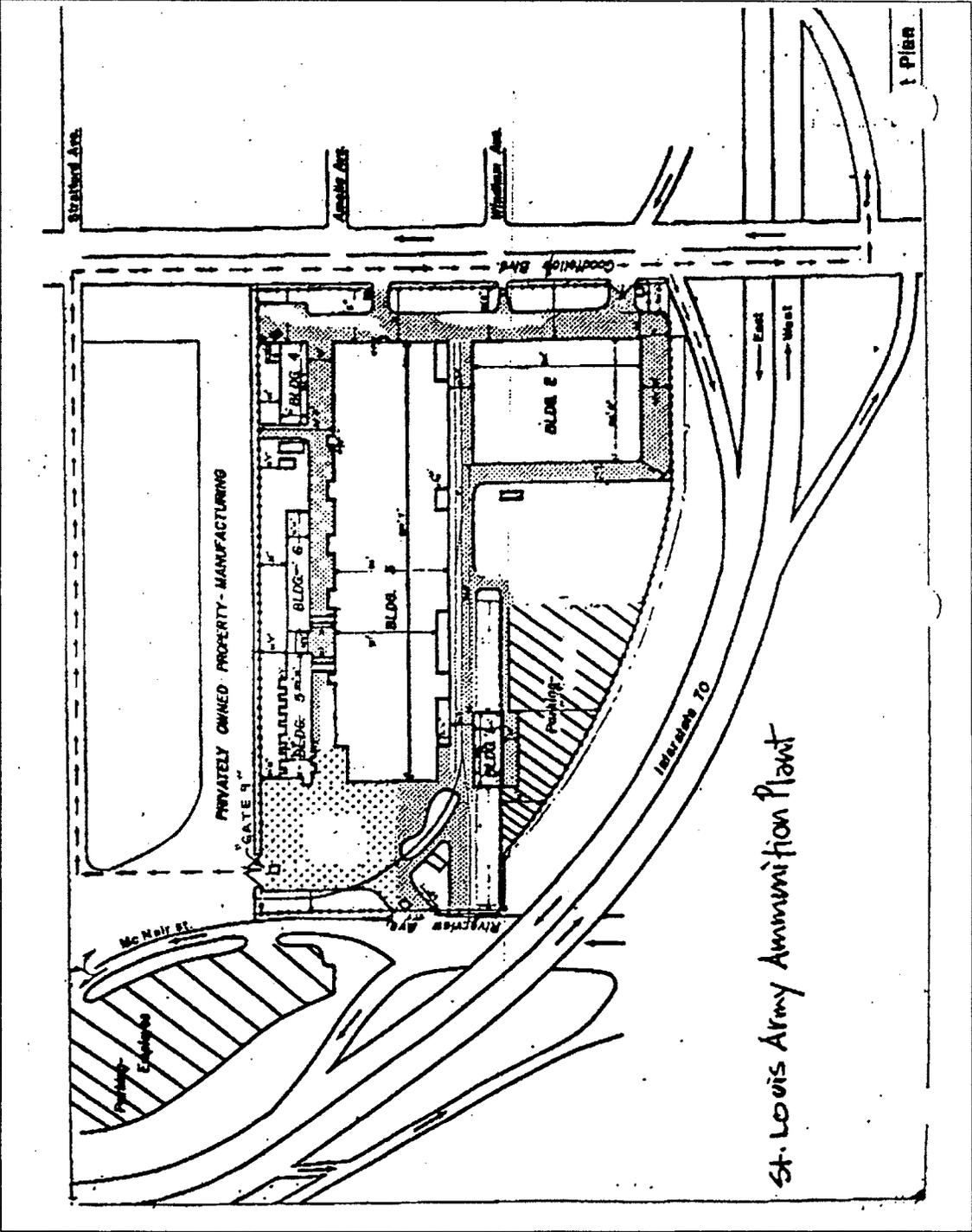
\* Unknown the ramifications of the PCB contamination issue, which will add cost and additional time.  
\*\* Assumes space will be constructed for warehousing  
All input coordinated with KC Corps of Engineers.

Recommendation: It is not recommended to pursue development of the SLAAP site. The operational constraints are significant concerning the floor to ceiling height restrictions and the column spacing. The DMA distribution mission would be severely degraded if Building 3 were utilized. The site and the buildings have remained vacant for over 20 years and the buildings and site are in disrepair. The costs identified in the analysis are based on an engineering assessment of the buildings and the DMA mission, however, the costs could be significantly higher through detailed study of the engineering feasibility and resolution of the PCB contamination. It is recommended that the site be excessed, in fact it is unclear as to why the Army has retained a site with no mission for over 20 years. The costs to demolish Bldg 1 and 2 are uncertain and the cost identified in this analysis is a preliminary figure based upon discussions with the Base Engineer. It is also undetermined whether the site would be large enough, given the need for new construction and parking. Additional land may needed to be acquired for employee parking. No cost has been included in this analysis for this item.

There are a number of uncertainties identified in this analysis concerning the environmental contamination, site size and building configuration. I have allocated an optimistic figure of six months in the analysis to resolve these

uncertainties, however an unfavorable report could either stop the project or cause additional delays. Given the order of magnitude of the costs, it does not appear reasonable to pursue further investigation. I recommend that the government pursue excessing the site and remove it from DoD inventory.

Mary Ellen Seale, RLA  
General Engineer



St. Louis Army Ammunition Plant

Mystic Star Antenna Site  
Belleville, Illinois

**MFR: 29 Sept 1995**

Site Survey conducted by: Mary Ellen Seale, DMA(PA)  
Rich Flauaus, DMA(IMEF)  
Craig Robillard, KC Corps of Engineers

**Location:** The site is located approximately 30 miles from the DMA site at Second Street, and approximately 5 miles from the city of Belleville, Illinois. The site is located approximately 2 miles from Scott Air Force Base.

**Mission:** Up until April 1995, the site was used as an antenna farm to support the Mystic Star mission. The site was decommissioned on 22 Sept 1995. Originally the site contained 8 large antennas, all but one of the antennas have been removed. The remaining antenna is 400 feet high and is used for low frequency radio transmissions. This antenna receives and sends signals and the base plans to maintain the antenna on site.

**Site Size and Configuration:** The site is rectangular and contains 29 acres. Approximately 5 of those acres contain the 400' radio antenna with attending guide-wires. The antenna area is fenced from the rest of the compound.

**Transportation:** The site has easy access off of Interstate 64 and Highway 158. The site abuts Route 161, a two lane road, in fairly good condition. The only access road to the installation is a two lane farm road, in poor condition. Services such as fire, police and ambulance would be provided by Scott Air Force Base.

**Utilities:** Along Route 161, the site has access to a 16" water line, and public sewer. On site is a water pump station which will remain on site. Electric service is provided by overhead lines, and is below capacity. It is unclear as to whether gas service is available.

**Environmental:** The site is 30 years old and previously contained emergency generators for the equipment housed on site. There were underground storage tanks for diesel fuel for the generators. The environmental office at Scott indicated that there was an oil spill near building 250 where the fuel tanks were located and the soil is contaminated. This office was unsure whether the underground storage tanks had all been removed. In all likelihood, the tanks remain on site and have been filled with sand.

**Development Issues:** The site is located in a cornfield, with farmland on all sides. There are no trees or amenities of any kind near the site. The site is flat, and there was no evidence of wetlands. From a development standpoint, the site would pose no development constraints, other than the structures that remain on site. The antenna would have to be relocated, since it sits in the middle of the site. The Scott Real Estate specialist indicated that the antenna could be moved either to one section of the site or off site.

Defense Mapping Agency Comments (Enclosure 1)

however, an off site location is not the preferred alternative since land would have to be acquired. Relocation of the antenna would require new analysis to determine the appropriate siting due to its line of sight requirement for the City of St. Louis and Scott Air Force Base. The antenna would have to be fenced off from the rest of the site, due to the sensitivity of the equipment and the possible radiation hazard.

The site contains several small concrete block buildings that would have to be demolished, all of the original piers for the antennas would have to be removed (some are as deep as 12 feet deep), and the attending electrical conduit servicing those antennas, would also have to be removed.

**Costs:** In order to develop the site, a complete environmental and engineering study would need to be conducted to determine if the site contains any hazardous materials as well as to determine the geotechnical and engineering constraints on the site. A relocation study to determine a new antenna location would have to be conducted, and the antenna would have to be relocated. Depending upon whether the antenna would fit on the site with the DMA facility, additional land may have to be acquired. New architectural plans and specifications would need to be developed. The timeline and preliminary costs needed are provided below:

	Cost (\$K)	Schedule
Environmental Survey	45	Oct 95 - Feb 96
Antenna Relocation Study	15	Oct 95 - Nov 95
Development Feasibility Study and Geotechnical	60	Oct 95 - Mar 96
Environmental Assessment	40	Mar 96 - Jun 96
Architectural Plans & Specifications	2,300	Jun 96 - Jun 97 (FY 98 MILCON)
Relocation of Antenna (no land cost assumed, demolition of existing site features, removal of USTs)	2,000	Jan 98 - Mar 98
Construction (assumes original DMA cost without land)	39,400	Feb 98 - Feb 00 (Assumes 2 yr construction & move-in)
<b>SUBTOTAL</b>	<b>43,860</b>	
Opportunity Cost of the Delay (Delta between Oct 97 and Feb 00, assumes 11.5/yr based upon EA)	<del>34,396</del> 29,125	<del>(21 mos)</del> 21 mos
<b>TOTAL</b>	<del>78,256</del> <b>63,985</b>	

**Recommendation:** It is not recommended to pursue development of the Mystic Star site. From a development standpoint, the preliminary analysis has identified the site as a fairly good site to develop, based upon size, configuration, utilities and location to major

transportation routes. However, it is unclear as to the ramifications or impacts of a 400 foot antenna adjacent the building, or the costs and details associated with relocating the antenna. Mr. Shepherd, the real estate specialist from Scott, did indicate that the antenna contains devices from other federal agencies, so coordination and new siting would involve accommodating a mix of requirements. Mr. Shepherd also mentioned that relocation of the antenna would not be easy given the criticality of the lines of sight required. The antenna was originally located there due to its direct line of sight between the hills and the city of St. Louis and Scott Air Force Base.

From a quality of life standpoint the site rates low, given its remoteness from goods and services. Nearby site amenities, such as food, shopping and other services are not nearby, nor is the site located on the Scott Air Force Base where services are available.

The costs of 'starting over' are significant as well as the time delay. Had this site been identified earlier, it appears that this site would prove a viable alternative to pursue.

  
Mary Ellen Seale  
General Engineer

MEMORANDUM FOR INFORMATION

SUBJECT: Site Visit to Goodfellow Federal Center

DATE: 25 May 1995

1. Representatives from AQI, AQM, and DMACSC(TM) conducted a survey of GSA facilities at the Goodfellow Federal Center, at 4300 Goodfellow Boulevard in St. Louis, on 22 and 23 May 1995. The DMA representatives were; Wayne Bruce and Ed Lawless (AQI), Craig Christensen (AQM), and Dave Stout (DMACSC). These individuals comprised the smallest possible group deemed able to best represent all engineering and operational concerns associated with occupying a new or renovated facility.

2. The purpose of the site visit was to meet with GSA on-site facility managers, and to conduct a survey of facilities. The facilities surveyed had been identified as potentially available for DMA occupancy, in the event of BRAC 95 actions that would relocate Army Aviation and Troop Command (ATCOM) personnel off of the Goodfellow Federal Center. The intent of the DMA survey was to evaluate the facilities for use in lieu of the MILCON project programmed for FY 96 construction in Arnold, MO.

3. The site survey began with a technical exchange meeting between DMA and GSA personnel, in order to match as closely as possible DMA requirements with potentially available space. As a result, GSA offered for DMA's consideration the following buildings on the east side of the Federal Center (site map attached):

Building 105: 150,000 sf of administrative space comprising the entire first floor of the two story building, and 100,000 sf of contiguous administrative space comprising the northern-most two-thirds of the second floor, for a total of 250,000 sf of administrative space.

Building 104: 150,000 sf of administrative space comprising the entire second floor.

Recognizing DMA's requirement for "high bay" storage and process space, GSA also proposed to construct a 45,000 sf "connector building" between the north ends of Buildings 105 and 104.

The total space offered as being potentially available comprises 400,000 sf of existing single-story administrative space, and 45,000 sf of to-be-constructed "high bay" space.

4. The existing condition of Buildings 104 and 105 is much like most buildings at the Goodfellow Federal Center; they were originally constructed as part of a World War II era ammunition plant, originally single-story industrial buildings 150 feet wide and 1000 feet long, with the roof at approximately 28 feet above

Enclosure

grade. Floor capacity of Building 105 was not immediately known, but the presence of a crawl space under the first floor would set its capacity at about 250 psf. Added later at the 14 foot-above-grade level was an interior floor slab, and the buildings were as such converted from being 150,000 sf industrial facilities to 300,000 sf administrative facilities. The southern portion (50,000 sf) of the second floor of Building 105 is occupied by a USDA lab and will remain, and the entire first floor of Building 104 (150,000 sf) is occupied by a VA Records Center, which will also remain.

5. Utilities serving the Federal Center were generally adequate, with dual feed electrical service to the complex, and individual heating and cooling plants in each building. A central energy monitoring system exists, but no capability for remotely controlling individual buildings from a central site. Water service to the base is in need of constant repair, and a system upgrade project is in planning, but with no fixed date for funding or execution.

6. The DMA representatives were escorted through the space, and were then given unescorted access to the space to allow further investigation, and were given use of a conference room to discuss findings and potential configuration of the space for use by DMA.

7. After a detailed, unescorted walk-through of the facilities, the DMA representatives developed a schematic plan for placing DMA-Arnold functions within the Goodfellow facilities. The proposed occupancy plan is as follows:

Building 105: Demolish the interior floor slab between the available contiguous first and second floor space, to create 100,000 sf of "high bay" storage and/or process space in the northern two-thirds of the building. Construct a shipping or receiving function at the north end of the building. Utilize the remaining 50,000 sf on the south end of the first floor for "low bay" process or process support functions.

"Connector Building" New Construction: Construct the entire available 45,000 sf, to house "high bay" storage and/or process functions, and as a shipping or receiving point for the DMA activity.

Building 104: Utilize as much as necessary to house all administrative and computer functions, constructing all necessary modifications.

8. The facility modifications required to make the spaces and the site ready for occupancy are detailed as follows, and include rough-order-of-magnitude (ROM) costs for accomplishing the work. These ROM costs are based on professional judgment, comparable levels of effort on other, smaller projects, and existing cost data on similar construction.

Defense Mapping Agency Comments (Enclosure 1)

	<u>Cost (\$M)</u>
<u>Building 105</u>	
Interior demolition first and second floors, Remove 200,000 sf of partitions, finishes, and utilities.	\$2.0
Major structural modifications. Remove 100,000 sf of interior floor slab. Modify existing window openings.	\$2.0
Structural enhancements to floor and columns for storage aids, printing presses.	\$1.0
Exterior wall treatments.	\$1.0
Roof repairs. (Flashing, penthouse walls and roofs, masonry repairs.)	\$1.0
Exterior demolition. Construct loading dock.	\$1.0
Interior finishes, lights for warehouse and process areas.	\$3.0
<u>Building 104</u>	
Interior finishes, repairs, and miscellaneous modifications for administrative occupancy.	\$2.0
Construct Computer Room, Comm Center	\$2.0
Roof replacement	\$5.0
<u>Connector Building</u>	
Construct new, complete 45,000 sf building	\$8.0
<u>Utilities (Buildings 104 and 105)</u>	
Install new mechanical systems; chillers, boilers, piping, air handlers, sprinklers, water supply repairs	\$4.0
<u>Site Work</u>	
Change entrance at northeast gate. Traffic pattern revisions and associated work.	\$2.0
<p>9. The sum of the <u>ROM costs</u> for modifying Goodfellow facilities for use by DMA is <u>\$13 million</u>, to which should be added a contingency figure of 20%, or \$6.6 million, for a total construction cost estimate of \$39.9 million. The A/E design fee for a project of this magnitude will be approximately \$2.5 million.</p>	

10. Although construction work to allow occupancy is feasible for the approximate costs shown, the facilities possess some fixed constraints that make their use undesirable. These are:

a. Column spacing in the primary warehouse/process area constructed in Building 105 is 20' x 20'. This is considered to be much too narrow to allow efficient warehousing or process operations, and results in a much greater floor space requirement, and inhibits the safe and efficient use of material handling equipment. For comparison, column spacing at the DMA-Arnold facility will be 30' x 30', and the existing column spacing at the Philadelphia Depot is 20' x 80'.

b. Even with a 45,000 sf "connector building", the long, narrow profiles of the available spaces are not sufficiently contiguous to permit efficient process flows that DMA's reengineered functions are predicated upon. All proposed DMA space at Goodfellow is on a single level, essentially three buildings comprising a "U" shaped facility, 1000 feet on a side and 300 feet across the bottom. By comparison, the DMA-Arnold facility is approximately 400' x 600', with functions on three contiguous vertical levels.

11. Additional factors not included in this analysis are the availability of an on-base cafeteria, fitness center, and child care facility. The compound is fenced and secured, and a guard force is provided. Parking appears to be adequate, although some off-base parking was observed along Goodfellow Boulevard. The surrounding community offers few immediately off-base services, and it was acknowledged by GSA staff that the crime in adjacent neighborhoods is a major concern to employees who must work beyond normal business hours.

12. The schedule for occupying the Goodfellow facilities would be approximately two years later than the occupancy schedule for DMA-Arnold, due to the necessity to await ATCOM vacancy in FY 98 before beginning construction.

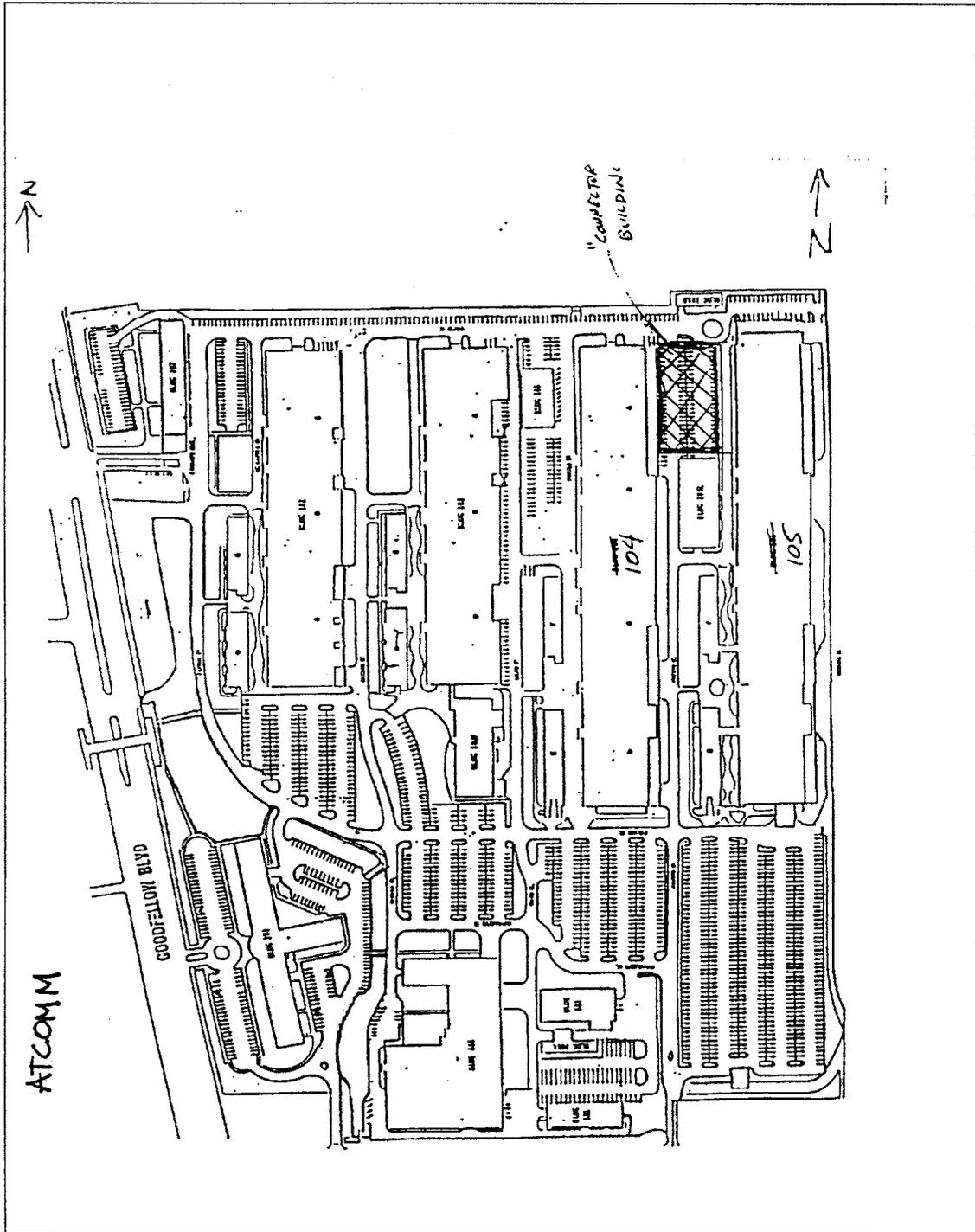
13. Based on the engineering and operational analysis conducted by DMA representatives, the Goodfellow Federal Center offers no measurable cost advantage over new construction (\$39.9 million vs. \$40.3 million). The operational disadvantages of modifying the existing facilities are substantial, and the cost of modifying DMA processes to accommodate the poor space configuration would be significant. The opportunity cost of the two year delay in occupying Goodfellow facilities in lieu of DMA-Arnold is \$23.0 million. This brings the entire cost for pursuing this alternative to \$65.4 million (construction @ 39.9, A/E fee @ 2.5, opportunity costs @ 23.0).

14. It is my recommendation that, given a choice, the best course of action is to continue forward with the planning, construction, and occupancy of the new DMA facility at Arnold.



Edwin C. Lawless  
AQIE

Q:MILCON/4300EVAL.DOC



# Defense Mapping Agency Comments (Enclosure 1)

## EXECUTIVE SUMMARY REPORT

PAGE 001

PROJECT TITLE : Economics Analysis on Sites for PSD Facility  
DISCOUNT RATE : 4.90%  
PERIOD OF ANALYSIS: 5 YEARS  
START YEAR : 1996  
BASE YEAR : 1996

PROJECT OBJECTIVE : Provide site for consolidated Printing and Distribution Facility.

### RESULTS AND RECOMMENDATIONS (\$ in thousands):

ALTERNATIVE NAME	NPV	EUAC
1 Arnold Site	\$39,348	\$8,848
2 Granite City Site (Melvin Pifer)	\$45,546	\$10,242
3 Ammo Plant Site	\$52,602	\$11,829
4 Scott Antenna Field	\$58,962	\$13,260
5 GSA Site (Goodman)	\$59,998	\$13,492

ACTION OFFICER: Melinda L. Brown

ORGANIZATION : Installations Management Support Office

L I F E C Y C L E C O S T R E P O R T

PAGE 001

ALTERNATIVE 1: Arnold Site

(\$ in thousands)

YEAR	Project Cost (01)	TOTAL ANNUAL OUTLAYS	MIDDLE OF YEAR DISCOUNT FACTORS	PRESENT VALUE	CUMULATIVE NET PRESENT VALUE
1996	\$40,300	\$40,300	0.976	\$39,348	\$39,348
1997	\$0	\$0	0.931	\$0	\$39,348
1998	\$0	\$0	0.887	\$0	\$39,348
1999	\$0	\$0	0.846	\$0	\$39,348
2000	\$0	\$0	0.806	\$0	\$39,348

NPV 100.00  
\$39,348

DISCOUNTING

CONVENTION... M-O-Y

EQUIVALENT UNIFORM ANNUAL COST = \$8,848 (4.90% DISCOUNT RATE, 5 YEARS)

L I F E C Y C L E C O S T R E P O R T

PAGE 002

ALTERNATIVE 2: Granite City Site

(\$ in thousands)

YEAR	Project Cost (01)	Opportunity Cost (02)	TOTAL ANNUAL OUTLAYS	MIDDLE OF YEAR DISCOUNT FACTORS	PRESENT VALUE	CUMULATIVE NET PRESENT VALUE
1996	\$2,100	\$0	\$2,100	0.976	\$2,050	\$2,050
1997	\$35,500	\$5,750	\$41,250	0.931	\$38,394	\$40,444
1998	\$0	\$5,750	\$5,750	0.887	\$5,102	\$45,546
1999	\$0	\$0	\$0	0.846	\$0	\$45,546
2000	\$0	\$0	\$0	0.806	\$0	\$45,546
NPV	77.05	22.95				
	\$35,092	\$10,454				
DISCOUNTING CONVENTION	M-O-Y	M-O-Y				

EQUIVALENT UNIFORM ANNUAL COST = \$10,242 (4.90% DISCOUNT RATE, 5 YEARS)

L I F F C Y C L E C O S T R E P O R T

PAGE 003

ALTERNATIVE 3: Ammo Plant Site

(\$ in thousands)

YEAR	Environmenta l Studies (01)	Project Cost s (02)	Opportunity Costs (03)	TOTAL ANNUAL OUTLAYS	MIDDLE OF YEAR DISCOUNT FACTORS	PRESENT VALUE	CUMULATIVE NET PRESENT VALUE
1996	\$100	\$1,700	\$0	\$1,800	0.976	\$1,758	\$1,758
1997	\$0	\$35,300	\$5,750	\$41,050	0.931	\$38,208	\$39,966
1998	\$0	\$0	\$11,500	\$11,500	0.887	\$10,204	\$50,170
1999	\$0	\$0	\$2,875	\$2,875	0.846	\$2,432	\$52,602
2000	\$0	\$0	\$0	\$0	0.806	\$0	\$52,602
NPV	0.19	65.62	34.20				
	\$98	\$34,516	\$17,988				
DISCOUNTING CONVENTION	M-O-Y	M-O-Y	M-O-Y				

EQUIVALENT UNIFORM ANNUAL COST = \$11,829 (4.90% DISCOUNT RATE, 5 YEARS)

LIFE CYCLE COST REPORT

PAGE 004

ALTERNATIVE 4: Scott Antenna Field

(\$ in thousands)

YEAR	Project Cost \$ (01)	Opportunity Costs (02)	TOTAL ANNUAL OUTLAYS	MIDDLE OF YEAR DISCOUNT FACTORS	PRESENT VALUE	CUMULATIVE NET PRESENT VALUE
1996	\$2,500	\$0	\$2,500	0.976	\$2,441	\$2,441
1997	\$41,400	\$5,750	\$47,150	0.931	\$43,885	\$46,326
1998	\$0	\$11,500	\$11,500	0.887	\$10,204	\$56,530
1999	\$0	\$2,875	\$2,875	0.846	\$2,432	\$58,962
2000	\$0	\$0	\$0	0.806	\$0	\$58,962
NPV	69.49	30.51				
	\$40,974	\$17,988				
DISCOUNTING						
CONVENTION M-O-Y M-O-Y						

EQUIVALENT UNIFORM ANNUAL COST = \$13,260 (4.90% DISCOUNT RATE, 5 YEARS)

LIFE CYCLE COST REPORT

PAGE 005

ALTERNATIVE 5: GSA Site

(\$ in thousands)

YEAR	Project Costs (01)	Opportunity Costs (02)	TOTAL ANNUAL OUTLAYS	MIDDLE OF YEAR DISCOUNT FACTORS	PRESENT VALUE	CUMULATIVE NET PRESENT VALUE
1996	\$2,500	\$0	\$2,500	0.976	\$2,441	\$2,441
1997	\$39,900	\$5,750	\$45,650	0.931	\$42,489	\$44,930
1998	\$0	\$11,500	\$11,500	0.887	\$10,204	\$55,134
1999	\$0	\$5,750	\$5,750	0.846	\$4,864	\$59,998
2000	\$0	\$0	\$0	0.806	\$0	\$59,998
NPV	65.97	34.03				
	\$39,578	\$20,420				

DISCOUNTING CONVENTION --- M-O-Y M-O-Y  
 EQUIVALENT UNIFORM ANNUAL COST = \$13,492 (4.90% DISCOUNT RATE, 5 YEARS)



ECONOMIC SECURITY

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE  
3300 DEFENSE PENTAGON  
WASHINGTON, D.C. 20301-3300

October 24, 1995

MEMORANDUM FOR: DIRECTOR, CONTRACT MANAGEMENT  
DIRECTORATE, OFFICE OF THE INSPECTOR  
GENERAL

FROM: DIRECTOR, ENERGY AND ENGINEERING, OFFICE OF  
DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR  
INSTALLATIONS

SUBJECT: Review of Cost Estimate for Defense Mapping Agency Printing and  
Distribution Plant, St. Louis, MO – Project No. SCG-0055.02

The Defense Mapping Agency has asked this office to review the cost estimate for the subject project and your recommendation that the building be resited and redesigned.

The current cost estimate for the project is based on a materials and labor take off from the final design. This is the most accurate cost estimate that can be developed at this stage of the project. However, there often is a great deal of variance between cost estimates and bid offers due to market conditions. This variance typically ranges between 20-25 percent among our bidders -- the sealed government estimate, in the bid box, is sometimes the lowest and sometimes the highest.

I should also note that your reference to Military Handbook 1010A is somewhat misleading. Military Handbook 1010A is a Naval Facilities Engineering Command document published as a Military Handbook. Other agencies are not required to follow the procedures outlined in the manual, although all the agencies use common cost factors, developed by a tri-service committee, in their development of initial planning estimates for categories of regularly constructed buildings.

I believe the three questions that need to be addressed for the programmed DMA plant are:

1. Is the facility overly plush?
2. Is it inappropriately sited?
3. If yes to the above, should it be deferred?



It is a matter of judgment, but we believe the design is appropriate and does not appear to be overly "plush". There are numerous studies that indicate good working conditions produce higher worker productivity (ranging from 6-30 percent). We do not have the exact data on the cost of the DMA operation at St. Louis, but our DoD average life-cycle mission-to-facility cost ratio is about 19/1. (Here "facility cost" includes the cost to build facilities and to maintain and repair them over their expected life. The ratio of mission-to-construction only is more like 54/1 -- see the attachment.) My concern is that we are under-building too many of our facilities, and paying a great long-term price in lost productivity.

The question of location is hard to determine, but here again it is a prime factor in worker productivity. It should be located where it is convenient to the work force, barring some mission need to be located elsewhere. The second consideration on siting is development cost which should not be separated from the site acquisition cost in any comparative study. We have a history in the Department of using Government-owned sites to avoid land acquisition, without consideration of development costs.

Unless there is some compelling reason to have the facility located at Scott AFB, other than to avoid land acquisition costs, I would not concur in deferring the project. The project reportedly will save over a million dollars a month in operations costs. It would take several months to resite the project at Scott AFB and redesign the project at considerable redesign costs. The Defense Mapping Agency has also made me aware of strong political interest in the siting of the facility at the St. Louis location that could lead to additional protracted delay. Lost productivity improvement would dwarf any savings in land acquisition or scope reduction.



Millard E. Carr, P.E.  
Director, Energy and Engineering

Attachment

cc: Defense Mapping Agency (DMA/IM)



DEPARTMENT OF THE ARMY  
KANSAS CITY DISTRICT, CORPS OF ENGINEERS  
700 FEDERAL BUILDING  
KANSAS CITY, MISSOURI 64106-2896

REPLY TO  
ATTENTION OF:

CEMRK-EP-DI (415-10e)

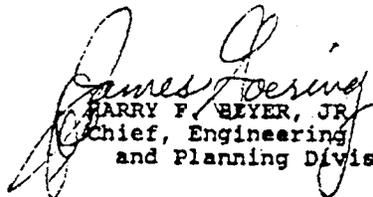
21 September 1995

MEMORANDUM FOR Commander, Defense Mapping Agency, ATTN: AQI-A3  
(Ed Lawless), 8613 Lee Highway, Fairfax, VA  
22031-2137

SUBJECT: Estimated Construction Cost, Replace Damaged Production  
Facilities, Saint Louis, Missouri

1. The construction cost estimate included with the 95% design submittal was thoroughly reviewed by our Cost Engineering Section and found to be accurate and appropriate for the scope of this project.
2. The cost estimate, as submitted by the Architect-Engineer, is in accordance with the Corps of Engineer's Computer Aided Cost Estimating System (CACES).
3. Point of contact is Mr. Craig S. Robillard, Project Manager, 816-426-7349.

FOR THE COMMANDER:

  
HARRY F. MEYER, JR.  
Chief, Engineering  
and Planning Division

## **Audit Team Members**

This report was prepared by the Contract Management Directorate, Office of the Assistant Inspector General for Auditing, DoD.

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