BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

Civil Agencies Should Save Millions By Recovering Silver From Photographic Wastes

Many civil agencies continue to pour silver-laden photographic solutions down the drain. The Department of Defense, however, has an effective recovery program to stop further dumping of silver. Several civil agencies are using the Defense program, and GAO recommends that other agencies join the program for effective silver recovery. Defense should take whatever steps necessary to accommodate additional civil agencies.

The General Services Administration needs to revise its regulations to clarify that silver recovery is required in all Government photo laboratories. In addition, the heads of civil agencies should take appropriate action to inform laboratory managers of the importance of silver recovery and require internal audits to identify laboratories with poor internal controls and wasteful practices. These actions, along with wider use of the Defense program, would conserve a valuable resource, prevent possible environmental harm, and save millions of dollars.

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

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To the President of the Senate and the
Speaker of the House of Representatives

This report discusses the potential for civil agencies to recover silver from photographic wastes. It is a followup to our 1977 report, "Additional Precious Metals Can Be Recovered."

We are sending copies of this report to the Director, Office of Management and Budget, and the heads of all Federal agencies.

Milton J. Socolar

Acting Comptroller General
of the United States

COMPTROLLER GENERAL'S REPORT TO THE CONGRESS

CIVIL AGENCIES SHOULD SAVE MILLIONS BY RECOVERING SILVER FROM PHOTOGRAPHIC WASTES

D I G E S T

Many Government agencies continue to waste money and a valuable natural resource by discarding silver-laden photographic wastes. By using inexpensive and easy-to-operate equipment in their photographic laboratories, these agencies could recover silver that frequently is being poured down the drain. The Government saves money by recovering silver because its market value is far greater than the costs to recover it. For example, in 1980 the Veterans Administration sold silver for $13,700,000 which cost only $185,000 to recover--a return of $74 for every $1 spent. (See chs. 2 and 3.)

This review, a followup to a 1977 GAO report, was to determine whether problems continued with ineffective or nonexistent silver recovery programs in Government agencies. Since the 1977 report, the Department of Defense (DOD) significantly improved its recovery effort, while many civil agencies made few improvements. DOD increased the amount of silver recovered from photographic wastes from 200,000 troy ounces in 1976 to nearly 300,000 troy ounces in 1980. This 50-percent increase in recovery is even more impressive when the market value of the recovered silver is considered--$900,000 in September 1976 and $6,100,000 in September 1980. (See ch. 4.)

Many civil agencies could make a similar increase in savings if their recovery efforts improved. Of the 44 laboratories which GAO reviewed (operated by 24 agencies and located in 4 metropolitan areas), only 12 effectively recovered silver, while 13 partially recovered, and 19 did not recover at all. (See app. II.) Collectively, these laboratories annually dump about 6,500 troy ounces of silver (worth between $71,500 to $325,000 in 1980) down the drain. Since the Government operates thousands of photographic processors in x-ray, microfilm, graphic arts, and printing laboratories, GAO believes millions of dollars can be saved annually by starting or improving recovery at all locations. (See ch. 3.)

Most civil agencies do not adequately recover silver from photographic wastes because

--they must spend time and money to recover but receive no direct benefit since proceeds from silver sales are normally returned to the U.S. Treasury,

--many laboratory personnel are not aware of the benefits of recovery,

--managers do not emphasize recovery, and

--the General Services Administration (GSA) has not fully supported the recovery program. (See ch. 3.)

Use of the existing DOD program by civil agencies would overcome most of the current problems. Civil agencies that join the system can save money by drawing silver from DOD and providing the silver as Government-furnished material to vendors supplying items that contain silver (for example, film or electronic equipment). DOD will also advise civil agencies on appropriate recovery techniques, furnish recovery equipment, train agency personnel, and provide numerous collection locations for recovered silver. Because of the extensive services DOD is willing to provide, several civil laboratories (from the National Aeronautics and Space Administration, Bureau of Census, and Public Health Service) are already using the DOD program. DOD is willing to accommodate additional civil agencies. (See ch. 4.)

Internal controls over recovered silver should be strengthened because of its high value and easy negotiability. Inventory records, equipment security, prompt shipment of recovered silver, proper disposal, and additional internal audits are needed to prevent theft. (See ch. 5.)

RECOMMENDATION TO THE ADMINISTRATOR OF GENERAL SERVICES

To provide clear program direction, GAO recommends that the Administrator of General Services revise the Federal Property Management Regulations to clarify that silver recovery is required in all Government photographic laboratories.

RECOMMENDATIONS TO THE HEADS OF CIVIL AGENCIES

To promote more effective silver recovery, GAO recommends that the heads of civil agencies

--take appropriate action to inform management officials having responsibility for photographic laboratories of the importance of effective silver recovery,

--join the DOD precious metals recovery program where this would be more cost effective than starting or maintaining their own programs, and

--require periodic internal audits of photographic operations to identify waste and poor internal controls.

RECOMMENDATION TO THE SECRETARY OF DEFENSE

Because of the cost effectiveness of silver recovery, GAO recommends that the Secretary of Defense take the necessary actions to accommodate additional civil agencies desiring to join the DOD program.

AGENCY COMMENTS

The 14 responses GAO received to the draft report generally agreed with the report's conclusions and recommendations. The full text of all comments received appears in appendixes III through XVI. Because the comments were often consolidated at higher organizational levels, these 14 responses represent all of the 24 agencies GAO reviewed. The general concurrence by this many agencies further emphasizes the need to start recovery or improve existing recovery programs in civil agencies.

GSA agreed with all of the report's conclusions and recommendations. However, it believed that the comparisons between GSA and DOD recovery services gave the impression that the agencies were in competition. GSA stated it had refrained from providing additional services to civil agencies since DOD offered more extensive services. GAO included these comparisons to provide civil agencies the necessary information for a rational basis to choose between the agencies.

DOD noted that many civil agencies had participated in its program and was agreeable to the inclusion of others, to the extent permitted by its existing resources. In view of the significant cost effectiveness of the DOD program, GAO believes that, if necessary, DOD's expansion to accommodate additional agencies would be warranted.

Contents

ABBREVIATIONS

DOD	Department of Defense
GAO	General Accounting Office
GSA	General Services Administration
NASA	National Aeronautics and Space Administration
PHS	Public Health Service
VA	Veterans Administration

CHAPTER 1

INTRODUCTION

Civil agencies of the Government use significant amounts of photographic film for medical x-rays, microfilm records, motion pictures, and still photographs. All film--photographic and x-ray--contains silver. Much of the silver can be recovered, refined, and reused.

Silver can be recovered from two main sources of photographic waste: film processing solution--called fixer--and scrap film. The usual ranges of recoverable silver from photographic wastes are 0.3 to 1.5 troy ounces per gallon of used fixer and 0.1 to 0.4 troy ounce per pound of used film.

In the past 10 years, the market value of silver varied between $1.54 and $50 per troy ounce. 1/ Formerly, the price of silver in the United States was set by the Congress which authorized the Department of the Treasury to buy and sell silver at a fixed price. This policy was changed in 1967, and a free market for silver resulted. Thereafter, the price of silver responded to market demand and speculative buying and reached a high of around $50 a troy ounce in 1980. Since then, considerable fluctuations occurred with the market price being about $11 a troy ounce in May 1981.

WHO IS RESPONSIBLE FOR SILVER RECOVERY?

The General Services Administration (GSA) is responsible for Government-wide precious metals recovery programs. In the Federal Property Management Regulations, GSA directs each agency to evaluate recovery potential, implement recovery systems, monitor results, and submit a consolidated semiannual report to GSA.

The regulations state that heads of executive agencies are responsible for establishing, maintaining, and pursuing a silver recovery program from used processing solution and scrap film and that each agency must consider recovering silver, regardless of the quantity of used processing solution or scrap film. Further, if a laboratory generates only small quantities of processing solution, it should make arrangements with another Federal laboratory area, using a recovery system, to receive and process the waste.

Recovery programs vary widely among the civil agencies. The most sophisticated system--operated by the Veterans Administration (VA)--conducts recovery operations at all VA hospitals and clinics.

1/Precious metals are measured by troy weight. A troy ounce is slightly heavier than a normal (avoirdupois) ounce.

Three VA supply depots in the continental United States evaluate recovery potential and monitor results at hospitals or clinics in their service areas.

Other executive agencies employ less intensive management organizations for silver recovery. Generally, each has designated a silver monitor responsible for assuring recovery of silver from photographic waste and preparing consolidated reports to GSA. Program management and daily operations generally are assigned to components having recovery potential. These components determine the economic feasibility of recovering silver and the method of recovery and report results to the agency silver monitor.

OUR PREVIOUS REPORT ON SILVER RECOVERY

In December 1977, we reported 1/ that Federal agencies collected only a small part of the recoverable silver from photo processing solutions used during fiscal year 1976. Further, GSA had not forcefully exercised its role as monitor of the Government-wide program nor had it assured that Federal agencies were, in fact, recovering silver or that recovery was maximum. As a result, GSA was not aware that:

--Some agencies did not recover silver.

--There was a lack of cooperation within and among agencies to increase recovery.

--Many agencies with recovery programs recovered less than they should have.

--Agencies using contractor services in the Washington, D.C., area did not recover all silver in processing solutions.

As a result of our report, GSA issued revised guidelines for the recovery of silver which require executive agencies to report semiannually on the amount of silver potentially recoverable and explain any lack of recovery. However, as discussed in chapter 3, GSA does not have authority to enforce regulations on silver recovery, and civil agencies generally have done little to improve their efforts.

A detailed discussion of this report's objectives, scope, and methodology is contained in chapter 6 and appendixes I and II.

1/"Additional Precious Metals Can Be Recovered" (LCD-77-228, Dec. 28, 1977).

CHAPTER 2

SILVER RECOVERY CONSERVES A VALUABLE RESOURCE, BENEFITS THE ENVIRONMENT, AND SAVES MONEY

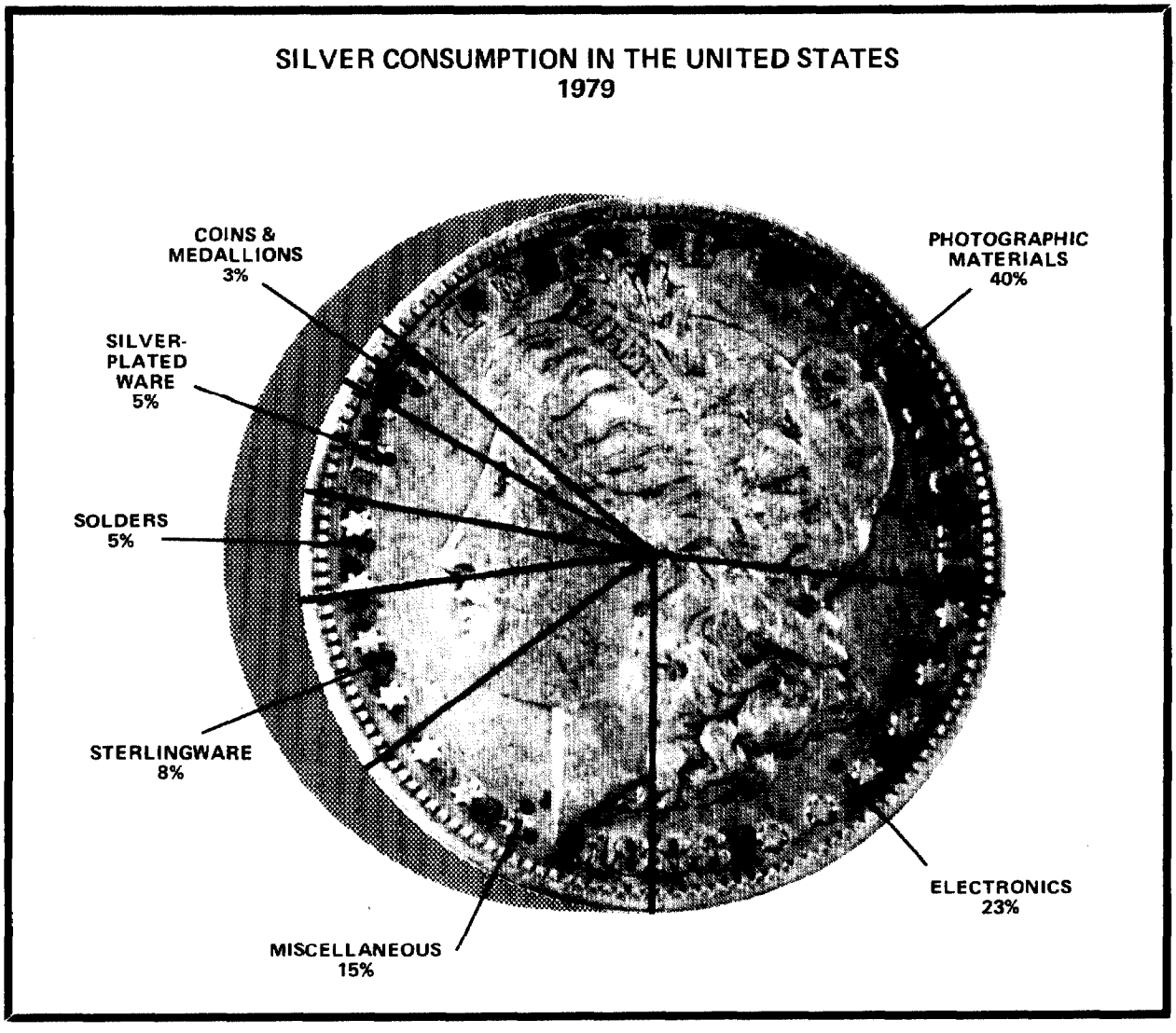
Silver recovery is important because silver is a limited resource with unique photographic, electronic, and aesthetic qualities. Today, silver recovery from scrap makes up the large deficit between market demand and mine production. Recovery conserves the environment by limiting the discharge of silver into waterways and by reducing the need for additional mining and smelting of new ore, thereby, reducing air pollution and conserving energy. Recovery also saves money because the market value of the recovered silver is far more than the costs to recover it.

SILVER RECOVERY CONSERVES A VALUABLE NATURAL RESOURCE

Silver, like many natural resources, is a valuable but diminishing commodity. Effective recovery conserves silver, satisfies most of the demand not currently met by mining, and reduces the need for imported silver.

Silver is valuable because of its unique qualities

In addition to its historic value in tableware and jewelry, silver's sensitivity to light and resistance to corrosion makes it a valuable resource to the photographic and electronic industries. As the following table illustrates, about 40 percent of the silver consumed in the United States in 1979 was used in the photographic industry and 23 percent in the electronics industry.



Photography is based almost entirely on film containing light-sensitive chemicals derived from silver nitrates and related compounds. These silver compounds produce image definition with unsurpassed clarity. Copying through xerography has reduced demand for silver, but this technique is only suitable for low definition products. Today, only silver films can produce the fine range of tones necessary for photographs and x-rays.

Silver is a critical component of many electronic parts because of its high conductivity and strong resistance to corrosion. As a result of these characteristics, the Department of Defense (DOD) often requires large amounts of silver as a contact metal or soldering agent in military equipment. For example, the MX missile system, if constructed, is expected to contain about 106,000 troy ounces of silver.

Recovery reduces the need for additional mining

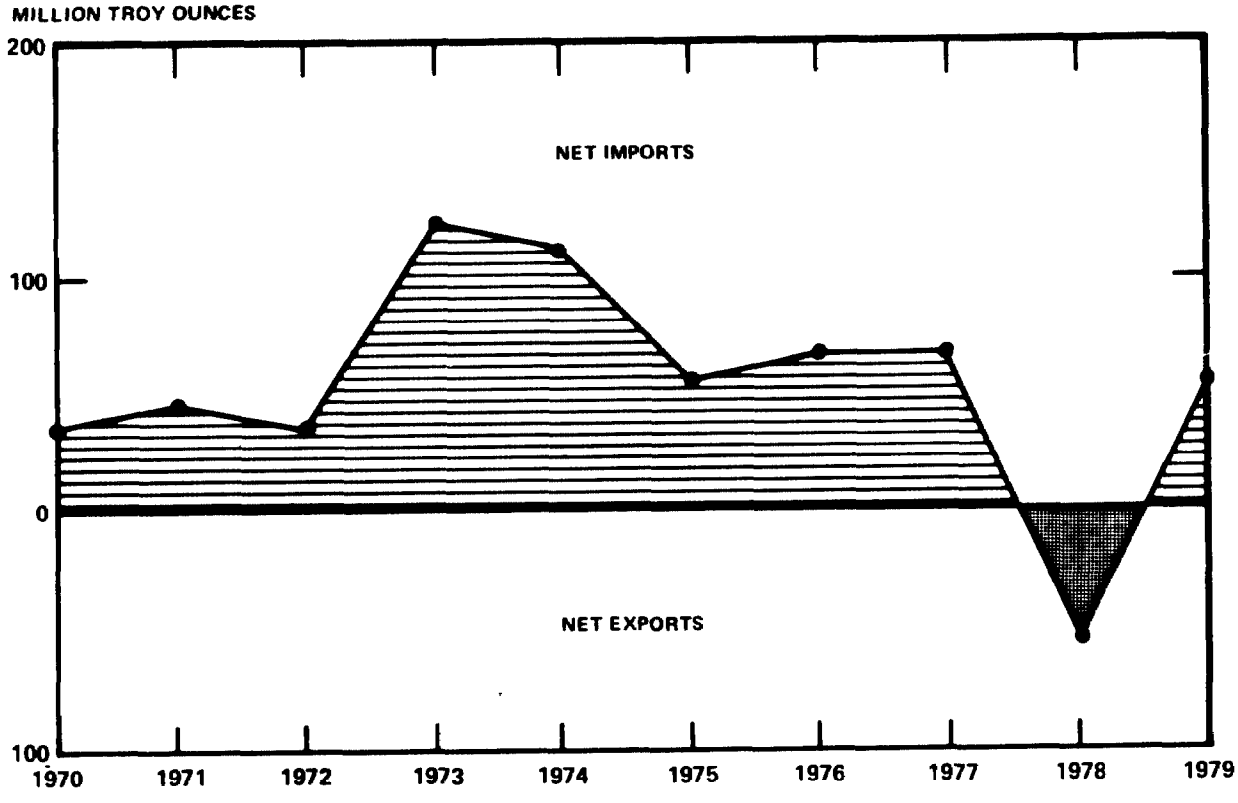
The United States uses about 160 million troy ounces of silver a year but mines only about 40 million ounces. This 75-percent deficit is made up by recovering silver from scrap (including photographic wastes, electronic scrap, and melting silver coins).

Currently, about 86 percent of the deficit comes from scrap and over half of this is from the recovery of photographic wastes. Domestic demand for silver is expected to rise to about 230 million troy ounces in 1985, but domestic production is expected to rise to only 50 million ounces. As a result of this spiralling demand, but only gradually increasing production, recovery from scrap and waste will become increasingly important.

Recovery helps reduce the need for imported silver

The United States leads the world in the consumption of silver, using about 38 percent of the silver mined each year. Because of the great demand, the United States must import a large share of its silver. Net imports of silver have exceeded net exports each year since 1970, except for 1978, as shown in the following chart. Reclaimed silver reduces the need for further imports and thereby reduces the balance of payments to foreign countries.

NET IMPORTS AND EXPORTS OF SILVER IN RECENT YEARS



SILVER RECOVERY BENEFITS THE ENVIRONMENT

Silver recovery benefits the environment because silver is potentially toxic in waterways and because silver recovery lessens the need for additional mining and smelting.

Silver can be potentially harmful to useful bacteria, fish, and wildlife when discharged into waterways. Generally, the silver compounds which are used in photographic processes have a low order of toxicity. Nevertheless, Federal regulations prevent large photographic processors from discharging silver-laden photographic wastes directly into streams, rivers, or lakes. In addition, some municipalities and States limit silver discharges into treatment plants since most photographic processors discharge wastes into sewer systems rather than directly into waterways.

Recovery also conserves the environment because the recovered silver lessens the need for more mining and smelting. This, in turn, reduces air pollution, abates disruption of the landscape, and conserves energy.

SILVER RECOVERY IS SIMPLE AND COST EFFECTIVE

Silver recovery equipment is relatively easy to operate, and the market value of the recovered silver far exceeds the costs of recovery. In the past, large photographic laboratories found recovery profitable when the price of silver was as little as 90 cents per troy ounce. Since the price has increased substantially in recent years, even small laboratories can profitably recover silver.

Two recovery methods are available

Two common methods of recovering silver from photographic wastes are electrolytic plating and metallic replacement. The method used generally depends on the size of the photographic operation. In some cases, the two methods may be combined to ensure more complete recovery.

Large laboratories would benefit from electrolytic plating

Large photographic laboratories (those using over 70 gallons of fixer a month) usually recover silver with electrolytic plating because the laboratories' potential for recovered silver can easily offset the relatively high startup costs for electrolytic equipment. This method requires an initial expenditure for equipment which usually runs from $500 to $700, but the equipment generally will last 5 years or more and can return silver valued at many times the initial cost.

This method is similar to silver plating tableware. During electrolytic plating, current is passed from an anode through silver-laden fixer to a cathode, causing silver to collect on the cathode. The silver is removed by hitting or flexing the cathode when the silver is one-fourth to three-eights inch thick.

Electrolytic plating has several distinct advantages. Since the silver is almost pure, it can be dried and weighed before it is shipped to a refiner, and the amount of silver to be returned

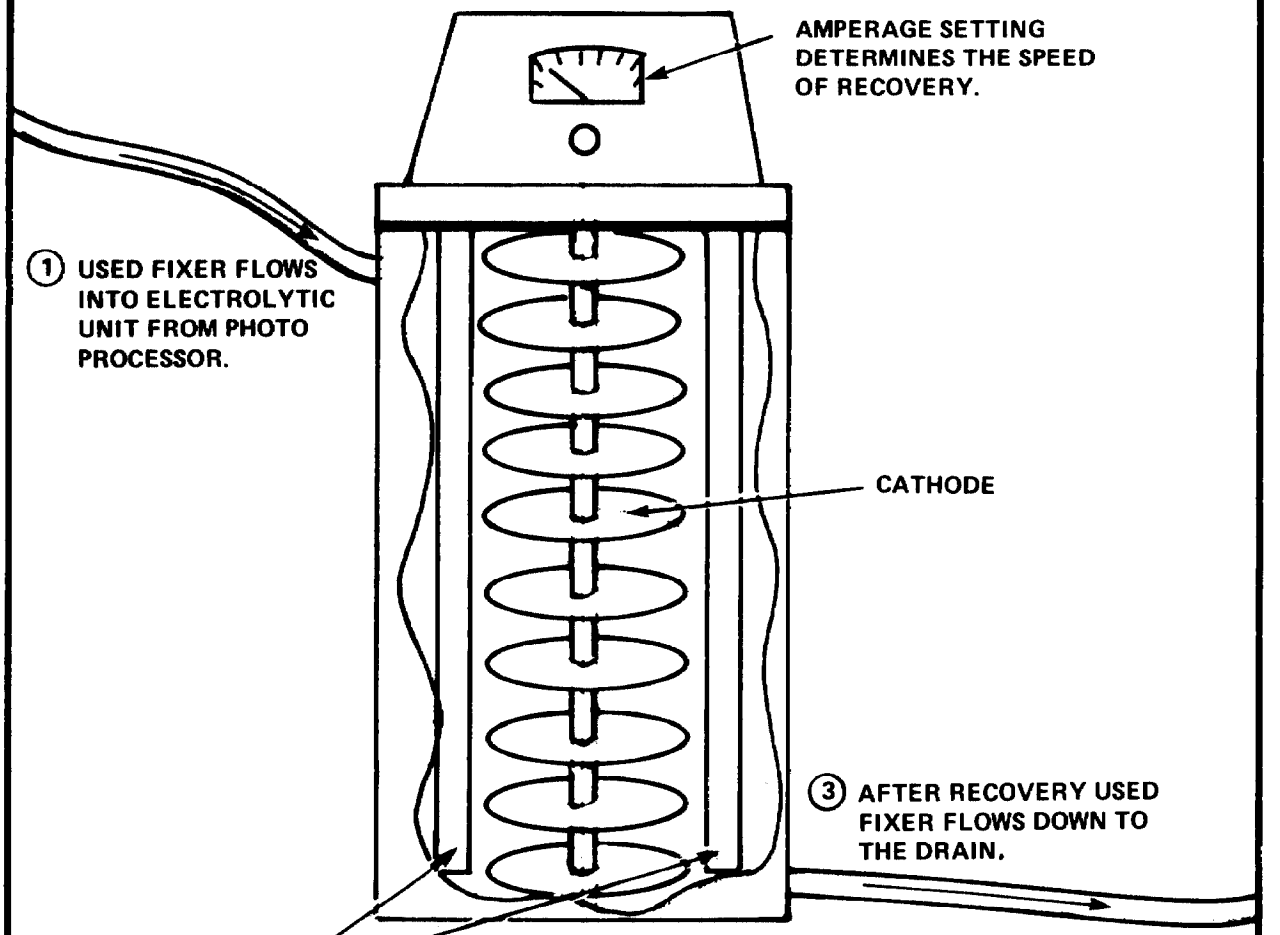
can be accurately estimated. Also, the high purity means low shipping and refining costs.

Medium-sized laboratories would benefit from metallic replacement cartridges

Medium-sized photographic laboratories (those using between 40 and 70 gallons of processing solution a month) generally use cartridges because they are easy to operate and are inexpensive. Silver-laden processing solutions flow into a cartridge containing steel wool and, through a chemical reaction, the silver settles to the bottom of the container. The silver is replaced by iron from the steel wool and the iron-rich solution flows out of the cartridge and down the drain. The sludge formed in the cartridge contains about 35-percent silver with the remainder being iron and photographic solution.

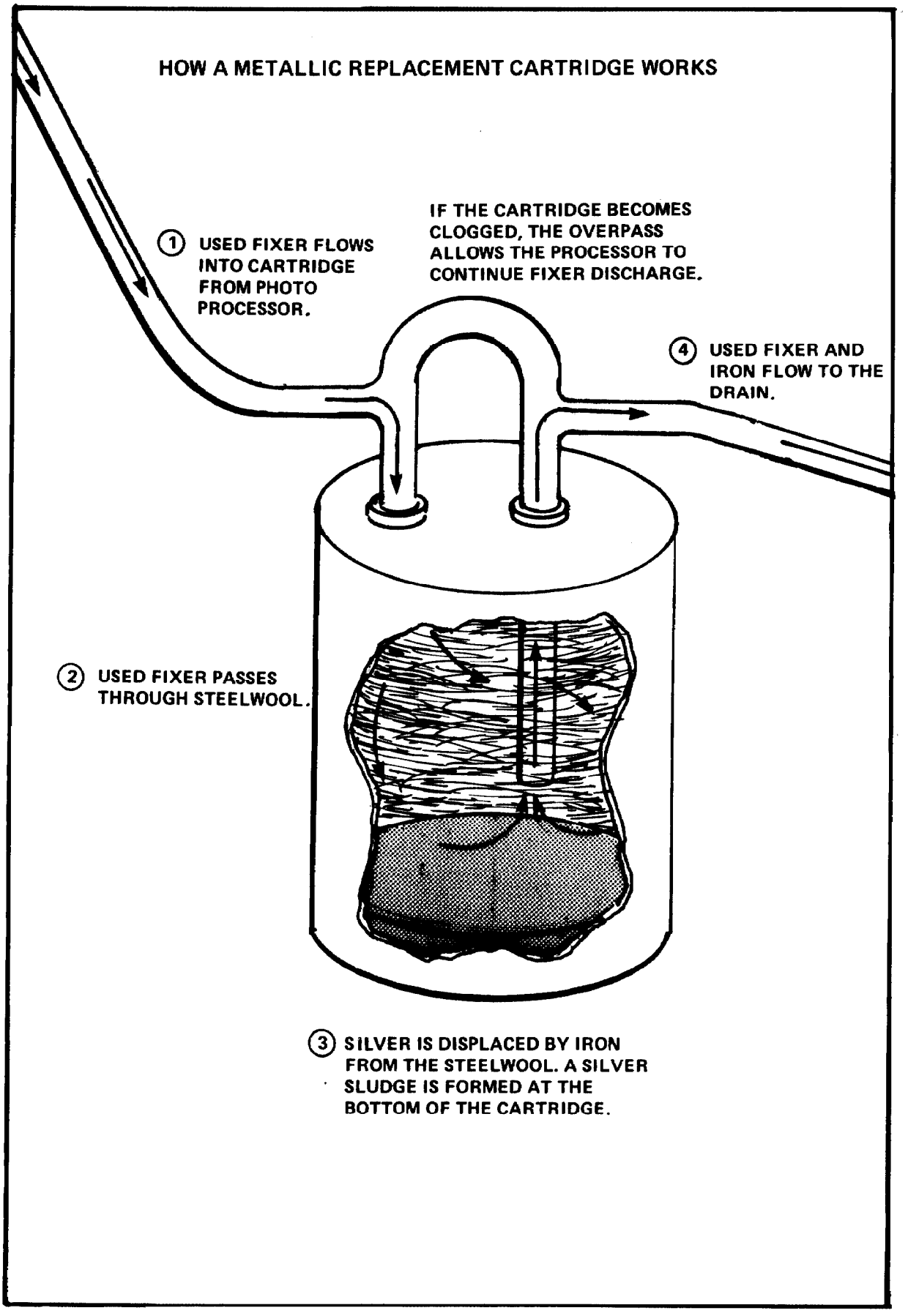
A cartridge will last 4 to 6 months and should be replaced when silver starts to pass out at the drain. This means that the steel wool is expended and the sludge in the cartridge is ready for refining. Laboratory personnel test the solution coming out of the cartridge with a treated test paper to determine whether the solution contains silver. Excessive use of a cartridge ultimately will cause most of the silver and iron to dissolve and flow down the drain.

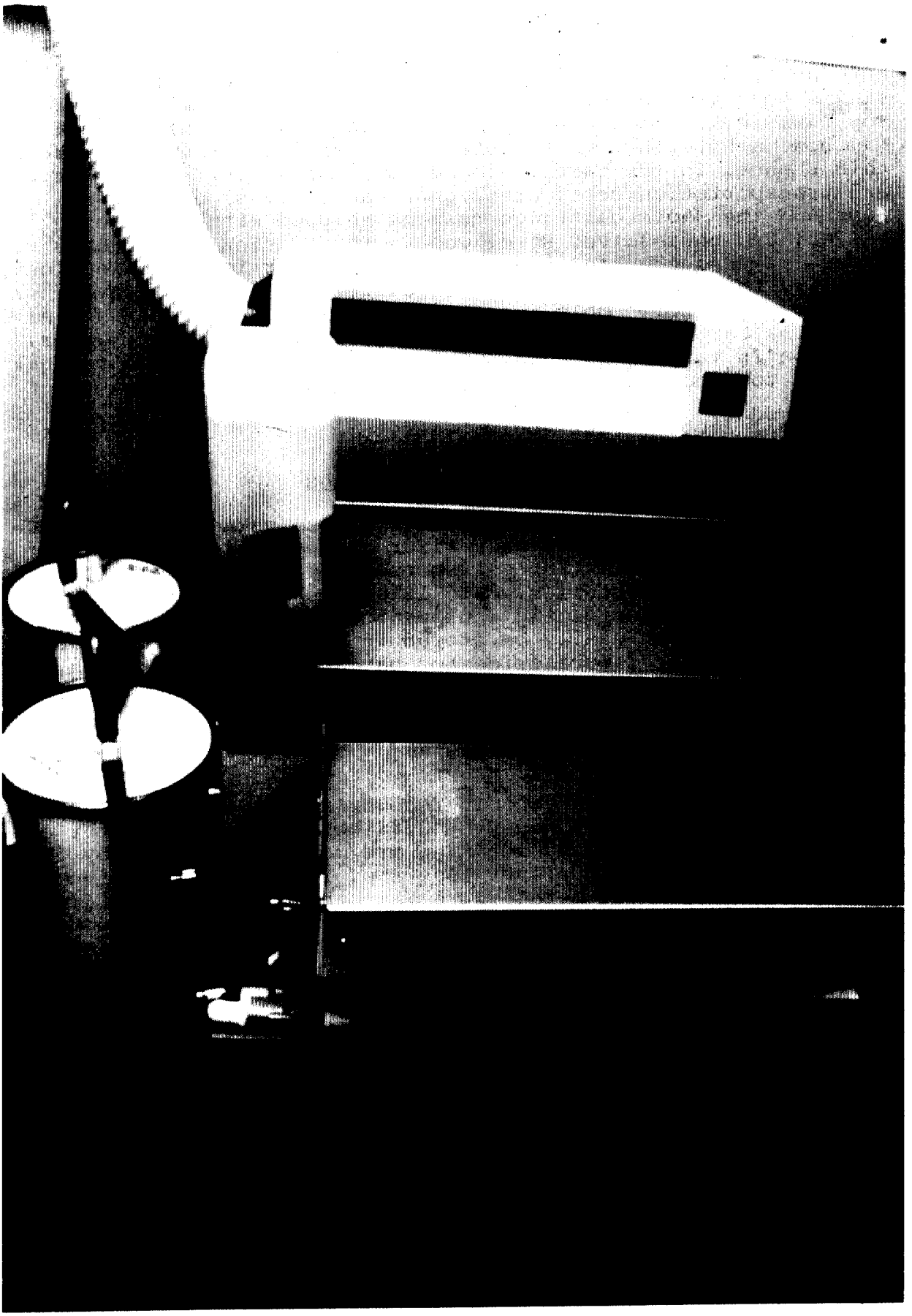
HOW AN ELECTROLYTIC UNIT WORKS



AN ELECTROLYTIC UNIT CONNECTED TO A PHOTO PROCESSOR

HOW A METALLIC REPLACEMENT CARTRIDGE WORKS





TWO METALLIC REPLACEMENT CARTRIDGES CONNECTED TO A PHOTO PROCESSOR

Cartridges cost only about $30 each, need no electricity, have no moving parts to malfunction, and are easily connected with single hose attachments. However, they have several disadvantages. For example, if used intermittently, the photographic solution may bore a hole through the steel wool and silver can pass through this channel in the cartridge and down the drain. Also, refining and transportation costs are high because the sludge is not pure and the whole cartridge must be shipped with solution, silver, and undissolved steel wool. In addition, cartridges require frequent checking to ensure that silver is not being lost. Finally, the biggest problem with cartridges is the lack of inventory control. Only the refiner will know how much silver is in the cartridge because the sludge contains silver, water, and iron in varying amounts. The user must rely on the refiner's honesty to return the correct amount of silver.

Small laboratories would benefit by turning over photographic wastes to larger laboratories for processing

Small photographic laboratories (those using less than 40 gallons a month) can save used fixer and periodically turn it over to larger laboratories for silver recovery. The intermittent workload in small laboratories would likely cause cartridges to malfunction while electrolytic equipment would not be cost effective. However, fixer can easily be stored in plastic containers and carried to larger laboratories for batch processing. Often, larger laboratories are located in the same or an adjacent building.

Silver recovery is cost effective

Government agencies should recover silver from photographic wastes because it saves money. Additional expenditures for equipment, transportation, and refining are more than offset by the value of the recovered silver (see app. I). After refining and transportation, a $30 metallic replacement cartridge will return about $327. A single $700 electrolytic unit will return over $13,000 from silver recovery during its 5-year life. These figures are based on conservative assumptions so greater savings are possible. At even the smallest laboratories (those using 10 gallons or less), it is worthwhile for them to at least save the fixer in plastic jugs and periodically turn it over to another agency for processing. The following shows the benefits and effectiveness of silver recovery.

The Veterans Administration

VA provides an example for the Government of effective silver recovery from photographic wastes. VA has been recovering silver from photographic wastes, dental amalgams, and hearing aid batteries since 1962. In that year, VA recovered silver worth $31,300 but, with higher silver prices and better methods, it recovered silver worth over $13,700,000 in 1980. During 1980, VA's expenses for recovery amounted to less than $185,000 for a return of $74 for every $1 spent.

The effectiveness of the VA recovery program can be traced to a variety of reasons, including:

--A large source of silver from x-ray units and dental laboratories in its 172 hospitals and 225 outpatient clinics.

--A vigorous campaign to inform hospital administrators and technical personnel of the importance of silver recovery (this includes a video training cassette, comparisons between various hospitals, and frequent feedback to those implementing the program).

--Recovery goals for each hospital based on the amount of x-ray film actually used.

--A good incentive (VA's basic legislation authorizes it to keep the money from the recovery in a revolving fund which offsets the cost of medical supplies).

--An active internal audit group to monitor the program's effectiveness and controls over the recovered silver.

--A standardized and simple program with clear instructions and frequent feedback on each hospital's effectiveness.

At most VA hospitals, x-ray processors automatically feed used fixer into holding tanks until enough is gathered to recover. An electrolytic unit is then placed over the container and run for about 24 hours. The fixer is tested with a copper wire to determine its silver content. If the wire turns dark after being held in the solution for 15 seconds, the electrolytic process continues. But if the wire remains shiny, the silver has been recovered and the solution is disposed of. Smaller photographic laboratories in the hospital gather the fixer in 5-gallon containers and periodically send it to one of the x-ray rooms for processing. When the electrolytic plate holds about one-half inch of silver, the plate is removed and sent by registered mail to a VA depot. The depot removes the silver and sends a clean electrolytic plate back to the hospital. The depot sends the material to the Bureau of the Mint's Assay in New York for refining into pure silver ingots. GSA sells the silver, and the funds are returned to VA for the purchase of medical supplies.

The VA system is not without problems. Broken electrolytic units or improper current settings can cause waste, but management, depot personnel, and internal auditors provide good checks to keep the system generally effective.

CONCLUSIONS

Silver from photographic wastes is important because it conserves a depleting natural resource, protects the environment, and saves money. In light of these factors, any dumping of photographic wastes without recovery can only be viewed as wasteful mismanagement of Government property and should not continue. The following chapter will establish that many Government laboratories continue such mismanagement.

CHAPTER 3

MANY GOVERNMENT LABORATORIES POUR SILVER DOWN THE DRAIN WHEN DISCARDING PHOTOGRAPHIC WASTES

Although many civil agencies can realize substantial savings by reclaiming silver, many pour silver-laden photographic wastes down the drain. Our 1977 report identified these problems, but civil agencies did little to establish effective recovery programs. The major factors contributing to the dumping of silver are (1) most civil agencies lack incentives to recover, (2) managers do not emphasize recovery, (3) laboratory personnel are often unaware of the benefits of recovery, (4) GSA is not fully supportive of civil agency recovery programs, and (5) GSA does not have the authority to enforce silver recovery regulations.

The overall potential for silver recovery in the civil agencies is difficult to estimate because agency headquarters are not aware of all laboratory locations, equipment used, or workload. Although civil agencies are required to report potential and actual recovery data semiannually to GSA, they often submit incomplete or inaccurate data and sometimes fail to report. Many agencies need to inventory laboratories and equipment and analyze their workload to determine what can be reclaimed. Concurrently with our review, the Department of Agriculture undertook such a study and estimated the overall potential for savings in the Department was $600,000 a year. Thirty-five laboratories were identified which had not previously reported to GSA.

Of the 44 laboratories reviewed (operated by 24 agencies and located in 4 metropolitan areas), only 12 effectively recovered silver, 13 partially recovered, and 19 did not recover at all (see app. II). Collectively, these laboratories annually dump about 6,500 troy ounces of silver (worth between $71,500 to $325,000 in 1980) down the drain. Since the Government operates thousands of photographic laboratories (to process x-rays, microfilm, graphic arts, prints, etc.), we believe that the agencies can save millions of dollars annually by starting or improving recovery at all locations.

MOST AGENCIES LACK INCENTIVES TO RECOVER SILVER

Most civil agencies lack incentives to develop silver recovery programs because (1) they are required to spend appropriated funds for recovery costs, but the proceeds from silver sales must be deposited in the U.S. Treasury and (2) internal auditors seldom review and criticize recovery operations.

While all of the agencies (included in our review) with legal authority to retain money from silver sales were attempting silver recovery, only 44 percent of the agencies without this authority did so. Agencies with this authority used the money to offset costs of supplies.

Of the 24 agencies visited, only VA, Agriculture, the National Aeronautics and Space Administration (NASA), and the Goverment Printing Office internal audit staffs had reviewed their agencies' silver recovery programs. Such audits can identify problem areas and act as positive incentives for management improvements. The following illustrates that lack of incentives can be costly and that internal auditors can influence positive action.

Department of Agriculture

As a result of our 1977 report, Agriculture's internal auditors reviewed the agency's photographic operations and found

--several photographic laboratories not recovering or ineffectively recovering silver,

--18 pounds of silver flake stolen, and

--poor sales terms from refiners due to noncompetitive bids.

At the 12 laboratories visited, the internal auditors reported that Agriculture lost about $175,000 during fiscal year 1978. Of the $175,000 lost, $95,000 (5,800 troy ounces) was attributed to discharging silver-laden fixer into the sewer. The remainder of the loss was caused by waste film being discarded in the trash, unfavorable recovery contract terms, and theft. The auditors concluded that since proceeds from recovered silver were deposited in the Treasury, many personnel had little incentive to recover as long as there was no direct benefit to the agency.

As a result of the internal audit report, Agriculture analyzed its recovery operations and concluded overall that recovery could be as much as $600,000 a year. Agriculture officials are considering (1) asking the Congress for authority to retain the proceeds from recovery operations to offset film costs or (2) turning all photographic wastes into DOD in exchange for recovery support and the opportunity to withdraw refined silver from DOD stocks.

GOVERNMENT MANAGERS DO NOT ACTIVELY SUPPORT SILVER RECOVERY

Of the 24 civil agencies reviewed, only VA actively encouraged and monitored silver recovery operations. VA's management established and monitored recovery goals for each hospital, provided detailed guidance for laboratory personnel, established a video training program for recovery operations, and encouraged internal audits to identify potential problems. Management in other civil agencies generally did not establish policies that would ensure recovery on an agencywide basis. Individual laboratory personnel were left to their own initiative to determine whether they should recover. As the effectiveness of the VA

program illustrates, agency management should not only be concerned with laboratory production and quality but also with silver recovery from used fixer and photo scrap.

PERSONNEL AT MANY SMALL LABORATORIES WERE UNAWARE OF SILVER RECOVERY BENEFITS

Personnel operating small laboratories were often unaware of the benefits of silver recovery. Generally, they did not know how much silver was in used fixer or that high silver prices made recovery cost effective at even small laboratories. Also, many were unaware of conservation or environmental concerns.

Silver recovery had seldom been incorporated into the job description of laboratory personnel, and many were unaware that Federal Property Management Regulations contained provisions on silver recovery. However, in those cases where personnel had read the regulations, many felt recovery was optional because of the vague language which required agencies to "consider" recovery. An exception was VA which had compiled detailed instructions for each employee generating precious metal waste and evaluated employees on recovery performance. The following examples characterize the problems of awareness.

U.S. Postal Service

Post Office officials at the Washington, D.C., headquarters generally were unaware silver recovery would be cost effective in their small photographic laboratories. Although three laboratories were located in the same building, none were recovering silver from the used fixer. Annually, these laboratories dump about 180 troy ounces of silver down the drain.

Bureau of Public Debt

The Bureau of Public Debt in Washington, D.C., annually pours about 120 troy ounces of silver down the drain from two small laboratories located in the same building. We noted, however, that the Bureau of Engraving and Printing, which shares the building with Public Debt, uses the recovery services of a GSA contractor. Laboratory personnel at Public Debt generally were not familiar with silver recovery techniques nor with the existence of a private contractor serving the building.

GSA HAS NOT FULLY SUPPORTED CIVIL AGENCY RECOVERY PROGRAMS

While GSA depends on private contractors to recover silver for civil agencies, it provides contractors for only the Washington, D.C., and Dallas metropolitan areas. These contractors survey civil agency laboratory needs, install recovery equipment, and collect the scrap silver. After the silver is refined, the contractors turn over an agreed-upon percentage of the market price to GSA and retain the remainder as payment for their

services. Outside Washington, D.C., and Dallas, GSA generally limits silver recovery support activities to public sales of scrap silver or silver-laden fixer in bulk form when such sales are requested by civil agencies. Agency officials and laboratory operators informed us that, in some instances, they were unable to obtain information from GSA regional personnel concerning recovery problems.

We received many complaints of problems in establishing and operating recovery systems through the GSA contractor for the Washington, D.C., area. For example, the contractor declined to install recovery equipment at three different laboratories because it considered the volume too small. Yet DOD and VA, which operate their own systems, normally recover from similar size operations.

At another laboratory operated by the U.S. Geological Survey, we discovered several operational problems. First, a bent pipe, located in a central collection room, was causing most of the fixer to flow down the wall and onto the floor. The problem apparently was longstanding because the acid-laden fixer had eroded the outer surface of the cement wall. Second, the electrolytic unit was running, but the fixer feed valve was blocked so nothing was being processed. Third, the electrolytic unit appeared to be covered by a corrosive material. Thus, neither the contractor nor the GSA building manager, who retained the key to the collection area, appeared to closely monitor the operation.

In Denver, sales of scrap silver and bulk fixer cause many administrative problems for both GSA and agency personnel. For example, GSA sold one silver recovery cartridge, weighing about 70 pounds, although the silver content or purity was unknown. The successful bidder paid $1,370 for the cartridge which, according to laboratory personnel, had processed 255 gallons of fixer. None of the parties to the sales contract, the laboratory personnel, the buyer, or GSA, had attempted to determine the value of the silver before the sale. GSA sales branch personnel stated they had no authority or funds which could be used to assay the cartridge, and the buyer informed us that he bid basically on his assumption that a cartridge could contain 80 to 95 troy ounces of silver. On the basis of an assay of fixer used by the laboratory during our review, we concluded that the cartridge could have contained up to 247 troy ounces of silver or more than double the amount due which the buyer computed his bid.

Contracts to collect bulk fixer in Denver also contained a number of weaknesses which resulted in GSA depending totally on voluntary actions by the agencies and the contractor providing information needed to adequately administer the contract. The contract required the successful bidder to (1) pick up the fixer solution when called by one of three agencies involved, (2) provide the agency with a receipt showing the gallons picked up, and (3) send a "certified assay" of a representative fixer sample to GSA. GSA was to use the assay document to determine the amount due and send a bill to the contractor who was to pay the amount

due within 7 days. Agencies which called for a pick up, however, were not required to send a copy of the pick-up receipt to GSA. Consequently, GSA had no knowledge that the contractor had picked up the fixer or that a certified assay was due. Our examination of records at GSA and the three agencies involved revealed:

--One contractor owed for fixer collected during 1980, but GSA had not attempted collection.

--One agency received payment for fixer directly from the contractor but did not know the basis used by the contractor to pay for the silver.

--Two agencies continued to sell fixer to the contractor during fiscal year 1980 after the sales contract had expired.

GSA LACKS AUTHORITY TO ENFORCE SILVER RECOVERY REGULATIONS

Although GSA has overall responsibility for recovery of precious metals throughout the Government and issues Federal Property Management Regulations outlining recovery requirements, it does not have enforcement power to ensure compliance with the regulations. Instead, GSA relies on internal audits, GAO reviews, and congressional oversight to identify agencies which fail to carry out their responsibilities. Periodically, GSA issues bulletins to the heads of all Federal agencies emphasizing needed management action or pointing out problems which have come to its attention. However, GSA does not undertake investigations to determine whether Federal agencies follow its regulations or whether periodic reports submitted by the agencies are accurately compiled.

GSA officials said that since our 1977 report on precious metals recovery, Federal agencies have more consistently reported as required. GSA frequently questions the agencies when the reports are overdue, but it analyzes little or none of the reports' contents.

The semiannual recovery reports submitted by the civil agencies are often inaccurate or incomplete. Further, the reports are not compiled consistently from agency to agency and cannot be summarized to show overall recovery potential or trends in actual recovery efforts. Many of the reports indicated improvements were needed in recovery operations and should have alerted agency management to needed action. For example, the reports submitted by GSA field activities showed that some GSA laboratories were dumping fixer down the drain.

Although GSA considers recovery mandatory, many agency officials and laboratory operators believe recovery is optional because of the vague language in the Federal Property Management Regulations. The usual explanation given to us for not recovering the silver was that the quantity was too little to justify recovery. However, in many instances, the laboratory personnel had not analyzed the wastes to determine silver content and did not know the recovery value.

CONCLUSIONS

Civil agencies can save millions of dollars by identifying each laboratory discarding silver-laden photographic wastes and by starting recovery programs. Government managers responsible for photographic laboratories need to emphasize the importance of recovery, provide training, and give continuing guidance on recovery techniques. As VA and Agriculture have shown, internal auditors can encourage better recovery by identifying laboratories not currently recovering or ineffectively recovering silver. Chapter 5 will demonstrate that these audits should also evaluate the internal controls over the recovered silver. GSA needs to clarify the Federal Property Management Regulations to make silver recovery mandatory. Doing so will eliminate the apparent confusion among field personnel as to when recovery programs should be undertaken.

Since GSA has not adequately supported civil agencies, we believe they can obtain better support and encourage local efforts by joining DOD's silver recovery program. (See ch. 4.)

RECOMMENDATIONS

We recommend that the Administrator of General Services clarify the Federal Property Management Regulations to emphasize that silver recovery is required in all Government photographic laboratories.

To promote more effective silver recovery, we recommend that the heads of civil agencies

--emphasize the importance of effective silver recovery to management officials having responsibility for photographic laboratories and

--require periodic internal audits of photographic laboratories to identify waste and poor internal controls.

AGENCY COMMENTS

Most agencies concurred with the conclusions and recommendations in this report and are now beginning to implement corrective actions. The widespread agreement with the report emphasizes the extent of the problem, as well as the need to start recovery or improve recovery programs in civil agencies.

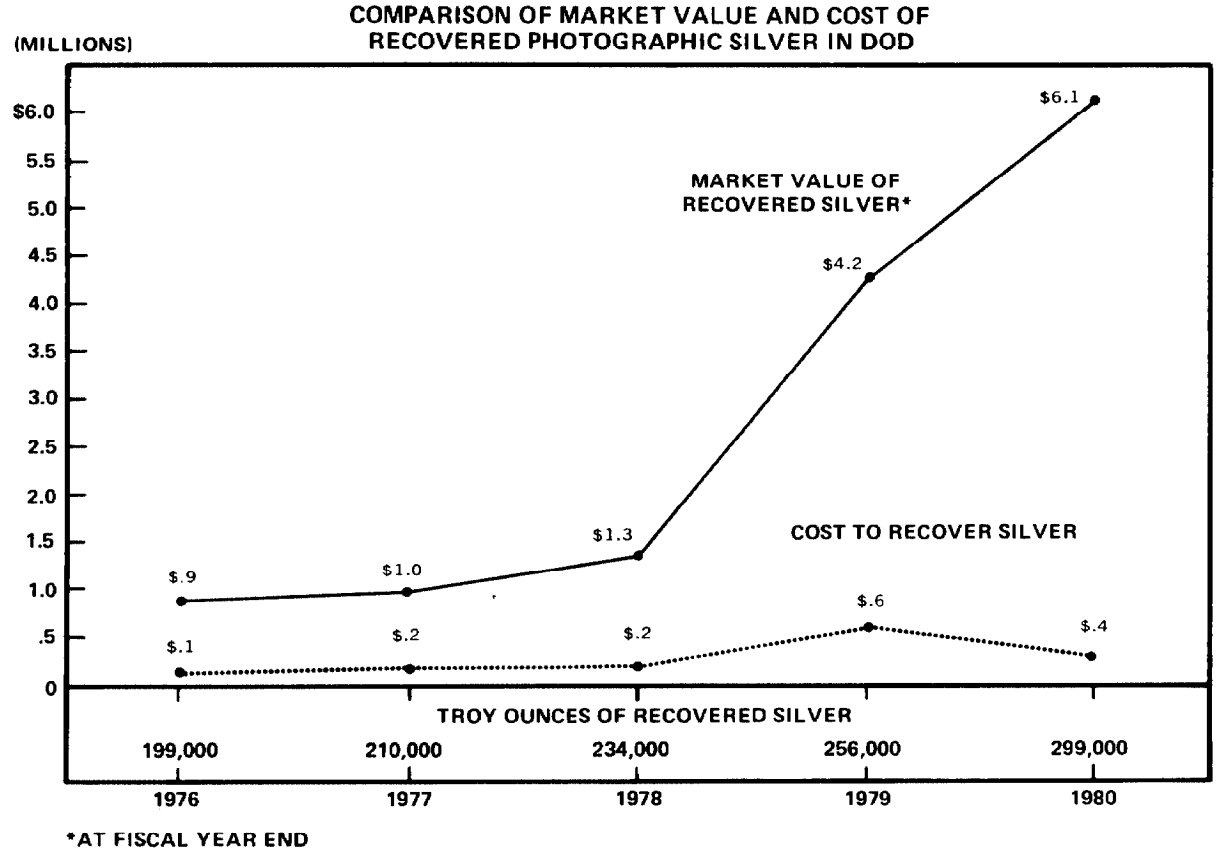
Two agencies disagreed with our classifications of their laboratories' effectiveness. However, effective recovery was possible at both agencies, and we have not changed their classifications. Their comments are discussed in appendix II.

CHAPTER 4

DOD OPERATES A COMPREHENSIVE AND COST-EFFECTIVE SILVER RECOVERY PROGRAM AVAILABLE TO CIVIL AGENCIES

DOD operates a silver recovery program which can be expanded to include most civil agencies with minimal expense and significant cost savings. DOD began recovering silver and other precious metals from electronic and engine scrap about 1954. Later, the program was expanded to include recovery of silver from photographic processes. The recovery program is integrated into the DOD excess property disposal operations, and DOD officials believe that they can assume additional recovery responsibility for civil agencies with minimal additional costs. Although the current Federal Property Management Regulations allow civil agencies to use DOD's system, few agencies have taken advantage of the opportunity.

DOD supplies the recovered metals to defense contractors as Government-furnished material when precious metals are required in the manufacturing process. In fiscal year 1980, the cost of the DOD recovery program was $3.8 million, yet the program reused precious metals worth about $47 million. The following chart illustrates the amount and value of silver recovered from photographic wastes in the last 5 years.



This chart shows that increased silver recovery and spiralling silver prices have made the program much more cost effective

over time. Recovery of precious metals from electronic and engine scrap is decreasing and will likely continue to decrease because more substitute materials are being used. However, silver recovery from photographic wastes could continue to increase if civil agencies, not currently recovering, join the DOD program.

DOD IMPROVED ITS RECOVERY PROGRAM SINCE OUR LAST REPORT

Since we reviewed DOD's precious metals program in 1977, DOD has made numerous management improvements, such as

- --increasing silver recovery from photographic wastes from 199,000 troy ounces in 1976 to 299,000 troy ounces in 1980;
- --establishing a 3-day training course in identifying and recovering precious metals;
- --hiring 11 specialists to identify photographic laboratories not recovering silver, install recovery equipment, and provide technical assistance for local personnel;
- --providing detailed guidance and regulations on precious metal recovery to local personnel;
- --increasing the identification of electronic items containing precious metals from 14,000 to 97,000; and
- --establishing a tracking system to monitor the shipment and refining of precious metals.

These improvements do not mean that the DOD program is without problems. The Defense Audit Service and Inspectors General still identify problems and encourage corrective action. These audit and review organizations provide objective evaluations and incentives to continue improvement.

DOD'S PRECIOUS METALS PROGRAM SAVES MONEY

DOD saves money by reusing recovered silver and other precious metals in new procurement contracts for electronic equipment, engine components, and aircraft parts. The total cost of recovering a troy ounce of these metals, including silver, is considerably less than the market value as the following table shows:

	Market value (Dec. 31, 1980)	FY 1980 DOD recovery cost	Difference
Gold	$599.26	$20.71	$578.55
Silver	16.45	2.91	13.54
Platinum	672.00	5.17	666.83

In fiscal year 1980, DOD supplied precious metals worth $47 million to its contractors, but spent only $3.8 million. The cost of the recovered metals includes the salaries of program personnel, recovery equipment, refining, transportation, and rent for office and storage space.

Recovered precious metals are supplied as Government-furnished material, which reduces the cost of procurement contracts requiring those materials. Usually, this means that two bids are requested from each contractor. One bid is priced with Government-furnished precious metals and another with contractor-furnished metals. DOD supplies the metals when it is advantageous to the Government. Because of the volatile changes in metal prices in 1980, many contractors preferred to use Government-furnished metal which assured availability and a known price.

Civil agencies can also draw from the DOD stocks of precious metals as NASA did for the space shuttle program. Several civil agencies are negotiating contracts with film manufacturers so that future film purchases will be offset by silver supplied by DOD. Despite additional requests for silver, DOD officials believe that most civil agencies will draw less silver than they reclaim.

DOD OFFERS CIVIL AGENCIES MORE SERVICES THAN GSA

DOD provides a wider range of services to civil agencies than GSA. GSA issued silver recovery regulations, provided technical contracts for defining needs, awarded recovery contracts for Washington, D.C., and Dallas, and wrote an informational brochure on silver recovery. However, the DOD program provides many more services and assumes most of the recovery costs which civil agencies would otherwise incur. DOD is willing to assume the additional recovery costs which would result from the expansion of its program because its recovery process is cost effective and the market value of the recovered silver will far exceed the additional costs. The following table shows the differences in DOD and GSA services.

COMPARISON OF SILVER RECOVERY SERVICES

OFFERED TO CIVIL AGENCIES BY THE

DEPARTMENT OF DEFENSE AND GENERAL SERVICES ADMINISTRATION

TYPE OF SERVICE	DEPARTMENT OF DEFENSE	GENERAL SERVICES ADMINISTRATION
SURVEY OF NEEDS	Provides experts or contractors at no expense to civil agencies.	Civil agencies must use GSA contractors at their own expense.
TRAINING IN RECOVERY	Provides a 3-day recovery school plus individual assistance by specialists.	None.
EQUIPMENT	Provides containers, cartridges, or electrolytic units in all geographic areas at no cost to civil agencies.	Provides recovery contractors in Dallas and Washington, D.C. areas. In other regions, agencies must purchase and maintain their own equipment or enter into their own contracts.
OPERATING INSTRUCTIONS	Detailed explanation of recovery.	None.
TURN-IN SERVICES	Over 240 locations accept photo waste.	Civil agencies turn photo waste over to GSA contractors in Dallas and Washington, D.C. In other regions, agencies declare photo waste surplus and sell the scrap or incur costs of refining and transportation.
OPERATING ADVICE	Specialists provide continuing assistance.	None.
CONTROL OF SILVER DURING REFINING	Metals are tracked from turn-in location to refining and storage. DOD personnel monitor refining process onsite.	Few controls.
SILVER AS GOVERNMENT FURNISHED MATERIAL	Civil agencies can draw silver from DOD stocks to offset costs of contracts requiring silver.	Silver is sold and proceeds turned over to the Treasury. No direct benefit to civil agencies.

These differences do not mean that GSA should assume additional responsibilities since this would be duplicative and unnecessary. However, the wider range of services offered by DOD helps explain why several civil agencies use, and others are considering the use of, the DOD program.

SEVERAL CIVIL AGENCIES ALREADY USE THE DOD PROGRAM

NASA, the Bureau of the Census, and some Public Health Service (PHS) hospitals currently use the DOD recovery program. NASA has a formal interagency agreement with DOD, while Census and PHS are formalizing agreements. The Department of Justice signed an agreement with DOD in September 1980 that provides that all Justice, Federal Bureau of Investigation, and Bureau of Prison laboratories will use the DOD program. The Justice agreement is currently being implemented. The following three examples illustrate effective interagency cooperation to conserve silver from photographic wastes.

National Aeronautics and Space Administration

NASA started depositing silver and other precious metals with DOD in 1965 because their facilities were often colocated or near each other and informal agreements for precious metals recovery were practical between local activities.

Until recently, NASA surveyed its own needs, purchased recovery equipment, and turned recovered silver over to DOD. In 1980, a formal agreement was drafted whereby DOD agreed to fully service NASA's recovery needs. Although the agreement is unsigned, DOD provided a survey of needs and installed electrolytic equipment at NASA's Ames Space Station in California. NASA officials at Ames and at headquarters are pleased with the agreement and the services received thus far. NASA also furnished recovered precious metals from DOD stocks to space shuttle contractors.

Bureau of the Census

Census personnel at Jeffersonville, Indiana, were concerned about disposing of silver recovery cartridges accumulated when microfilming the 1980 census. At one time, Census had about $500,000 worth of silver stored at its facility. Rather than incur nonreimbursable refining costs or turn the cartridges over to GSA for sale, Census deposited used cartridges with DOD at Fort Knox, Kentucky. This disposal method provided a quick outlet for large quantities of unrefined silver sludge accumulated over time. Census personnel have been pleased with the services and are working on an agreement with DOD to provide full service in the future.

Public Health Service

Several PHS hospitals have individually approached DOD for help in recovering silver from their x-ray departments. On an informal basis, DOD personnel installed recovery cartridges and the hospitals turn the used cartridges over to DOD. The following example illustrates one of these arrangements.

The PHS in San Francisco, California, generates used fixer solution and scrap film. A recovery cartridge is connected to each of three film processors in the radiology department and to a processor in the nuclear medicine department. When a cartridge is exhausted, PHS employees replace it and store the used one. They also collect and store scrap film.

Since 1969, PHS had disposed of its fixer and film through DOD at Alameda, California. There is no set disposal schedule. Whenever PHS personnel have a truck and a driver available, they box the film and take it and the cartridges to the disposal facility. Under this informal arrangement, PHS does not directly receive any proceeds from the sale of silver sludge in its cartridges or scrap film.

CONCLUSIONS

DOD has an extensive program to recover precious metals from photographic, electronic, and engine scrap. Greater use of this program by civil agencies would conserve silver and save money, yet incur minimal costs to DOD. Civil agencies not recovering silver would gain the expertise of years of experience by joining the DOD program, and civil agencies currently using GSA contractors would benefit from the wider range of services available from DOD. Civil agencies using the DOD program could also use recovered silver to offset the cost of future contracts that require silver. Within each civil agency, personnel currently working in photographic laboratories could assume some monitoring responsibilities with minimal time requirements yet save a valuable resource that is often going down the drain.

RECOMMENDATIONS

We recommend that the heads of civil agencies join the DOD precious metals recovery program where this would be more cost effective than starting or maintaining their own programs. We also recommend that the Secretary of Defense take the necessary actions to accommodate additional civil agencies desiring to join the DOD program. This should prevent further dumping of a valuable resource and save money by reducing future procurement costs.

AGENCY COMMENTS

DOD said it will continue to support civil agencies to the extent it can within existing resources. Although equipment and turn-in services would not be a problem, personnel shortages for

surveys and technical assistance would be a problem if most civil agencies joined the DOD program. Since DOD spent only $400,000 to recover silver from photographic wastes worth $6,100,000 in 1980, we believe expansion of the program, if necessary, to accommodate additional agencies would be warranted. Therefore, we have added a recommendation that DOD take the steps necessary to accommodate additional civil agencies.

GSA was concerned that the report's comparison between GSA and DOD recovery services looked as though the two agencies were in competition for silver recovery in civil agencies. GSA said that as early as 1965, it refrained from doing more in recovery because of the existing DOD potential for helping civil agencies. However, DOD officials noted they were generally unable to assist civil agencies until recently because of the problems found by GAO and DOD auditors in the DOD program. GSA's restraint in providing recovery services is partly responsible for the existing problems in civil agencies noted in our 1977 and current evaluations. Since DOD has made significant improvements in its program and is able to provide services to other agencies, we believe that it would be duplicative and unnecessary for GSA to provide additional services. Although GSA's regulations provide agencies with a choice of using either DOD or GSA, the regulations do not discuss the range of services offered by the two agencies. The comparison in this chapter provides civil agencies with a rational basis for choosing between GSA and DOD since the comparison is not made in any guidance currently available to these agencies.

CHAPTER 5

INTERNAL CONTROLS OVER SILVER RECOVERY SHOULD BE STRENGTHENED

Silver is a valuable and readily negotiable commodity, yet many Government agencies have poor internal controls over recovery, storage, and disposal of silver-laden waste products. Deficiencies include

--failure to maintain accounting records,

--lax security over recovery equipment and silver,

--improper sales of recovered silver, and

--few internal audits.

Since each agency operates under conditions peculiar to its responsibilities, size, and location, a detailed standard system of internal control cannot be developed to fit all agencies. Certain principles, however, can be asserted as essential to good internal control.

INVENTORY RECORDS SHOULD BE KEPT

Sixteen of the 25 laboratories visited, which were recovering or partially recovering silver, failed to maintain adequate inventory records to show the amount of silver collected. In addition, they generally failed to establish goals estimating the amount of silver that should be recovered based on the photographic processing workload. The importance of adequately accounting for assets, such as scrap silver, generated by Federal agencies, stems from the fact that public funds are invested in these resources. This investment creates the management need to account for these resources and to use all appropriate techniques to procure, manage, and dispose of the resources properly. The following is a typical example of inadequate recordkeeping which prevents agency personnel from determining how much silver they should be recovering.

A medical clinic operated by the Federal Aviation Administration in New York had no inventory records to show the amount of fixer solution or x-ray film used and did not attempt to estimate the amount of silver it should be collecting. A private contractor installed recovery equipment and periodically notified the clinic of the amount of silver collected. Clinic officials had no way to reconcile the contractor's recovery report to agency records, and thus, the contractor's records were accepted without question.

RECOVERY EQUIPMENT SHOULD BE SECURE AND HARVESTED SILVER SHIPPED PROMPTLY

Eleven of the 25 laboratories visited, which were collecting silver, did not have adequate physical controls to prevent loss or theft of used fixer solution or crude silver. Silver recovery equipment was often left unlocked and easily accessible to anyone entering or working in the photographic laboratory. In addition, laboratories sometimes kept large quantities of harvested crude silver on hand apparently because no shipping policy existed and laboratory personnel were unsure what to do with harvested silver. For example, at one Geological Survey laboratory, personnel stored 125 pounds of silver worth over $20,000 in a safe. Personnel at another Geological Survey laboratory stored 15 pounds of silver worth about $2,000 in a metal cabinet. This silver, which had been collected since 1975, accumulated during a period when the agency operated its own recovery program. The laboratory is now serviced by a GSA contractor, and laboratory personnel were unsure what to do with the crude silver. So far, theft has probably been hampered because recovered silver contains various impurities and thus it lacks the appearance of value.

We did not identify instances of loss or theft of crude silver at the locations visited; however, the Department of Agriculture's Inspector General recently reported that 18 pounds of silver, worth about $2,000, were stolen from an Agriculture laboratory and that agency personnel were not aware of the loss until the matter was brought to their attention by local law enforcement authorities.

PROCEEDS OF SILVER SALES SHOULD BE DEPOSITED IN THE TREASURY

Two of the laboratories visited did not properly account for the proceeds received from sales of recovered silver. Instead, proceeds were offset against photo processor maintenance charges by private contractors. This arrangement does not comply with provisions of the Federal Property Management Regulations which require that scrap silver be declared surplus material and sold only by GSA with all proceeds from such sales being deposited in the Treasury (unless the agency has legislation to keep the funds like VA). For example, a Postal Service medical clinic in New York allows a private contractor to offset the value of recovered silver against an equipment service contract. The clinic supervisor said postal officials have not questioned this 9-year-old arrangement. The supervisor also said the value of the silver was determined by the contractor and there was no way for the clinic to determine the accuracy of the count.

ADDITIONAL INTERNAL AUDITS NEEDED

Silver recovery operations at few of the agencies covered in this study were subjected to internal audit. Adequate internal audit is an essential element of internal control and a primary method whereby management can determine whether local operating

units understand overall policy, maintain adequate records, and protect public assets. An example of possible benefits can be seen in a January 1980 report by the Inspector General of the Department of Agriculture. That report demonstrated that silver recovery was given low priority in Agriculture and that, during fiscal year 1978, about $175,000 in lost revenue occurred from discarding scrap silver and unfavorable rates and terms received on sale of silver and waste products. As a result of the study, Agriculture undertook a detailed analysis of recovery operations and concluded that effective recovery throughout the Department could result in as much as $600,000 in annual savings.

In addition, the Inspector General of VA published a report in November 1979 which concluded that while recovery systems were operational at each medical center evaluated, some opportunities still existed to recover silver lost by overflow from equipment and failure to collect used fixer from some film developers.

Internal audit reports such as these, however, were the exception rather than the rule. Most agencies need to determine whether field laboratories understand the requirements of the Federal Property Management Regulations, including methods of recovery, security, and allowable disposal techniques for recovered silver scrap.

CONCLUSIONS

The increased value of silver should make agency officials, laboratory personnel, and internal auditors more sensitive to proper control over recovery, storage, and disposal of silver-laden wastes. Recovered silver usually lacks an appearance of value because it is mixed with various impurities. This mask may have prevented widespread theft in the past, but higher prices and wider publicity could increase theft in the future unless the agencies improve internal controls. The internal audits that we are recommending in chapter 3 should include an evaluation of internal controls.

CHAPTER 6

OBJECTIVES, SCOPE, AND METHODOLOGY

This review, a followup to our 1977 report, was to determine whether problems continued with ineffective or nonexistent silver recovery programs. We focused on civil agencies because DOD was making an extensive audit of its operation at the time we started this assignment. However, we interviewed DOD program managers, visited the Defense Precious Metals Recovery Office, reviewed the work of internal auditors, and attended DOD's 3-day training course on precious metals recovery because three civil agencies had cooperative recovery arrangements with DOD.

One of the major deficiencies discussed in our 1977 report concerned the failure of civil agencies to recover silver from fixer solution in their photographic laboratories. When it became apparent that the situation had not improved, we concentrated our efforts on finding a viable solution to this problem. Although GSA and the agencies do not know the entire universe of Government photographic laboratories, we believe it may be in the thousands since laboratories are usually located in x-ray, mapping, printing, graphics, and microfilming operations. We reviewed the operations of 44 laboratories operated by 24 agencies located in 4 major metropolitan areas (see app. II). The photographic laboratories represented a variety of sizes and types of processes including x-ray, photoprint, microfilm, and graphic arts. The four metropolitan areas selected (San Francisco, California; Denver, Colorado; New York City, New York; and Washington, D.C.) represent a variety of geographical areas with a concentration of Government operations. The selected agencies included those in all geographical areas, like the Postal Service, as well as those more likely concentrated in specific areas, like the Bureau of Mines in Denver.

We classified recovery operations in these photographic laboratories in one of the following categories:

--Effective, if the laboratories recovered silver and there were no apparent problems.

--Partially effective, if the laboratories attempted recovery but experienced observable problems (for example, broken or misused recovery equipment and disposal drains not connected to equipment).

--Not effective, if the laboratories did not attempt recovery.

Estimates of silver losses were based on the gallons of fixer used multiplied by 0.3 troy ounce of silver. The 0.3-estimate is conservative since the industry average ranges from 0.3 to 1.5 troy ounces per gallon.

We also interviewed officials at NASA, the Bureau of the Census, and the Department of Justice to assess their experiences in using DOD's program.

We based savings and cost estimates for recovery potential on DOD's and VA's actual experiences. Actual savings may be greater than these estimates since we used the most conservative data when ranges of information were available (see app. II).

To get a broad background on silver recovery techniques, conservation, and environmental concerns, we conducted an extensive literature search and interviewed personnel at the Silver Institute, Environmental Protection Agency, various municipal sewage treatment plants, and 11 recovery equipment manufacturers.

We also reviewed internal audit reports on silver recovery at NASA, Government Printing Office, Department of Agriculture, and VA. Internal auditors in other civil agencies included in this review had not conducted audits on silver recovery at the laboratories we visited.

MINIMUM SAVINGS FROM SILVER RECOVERY OVER THE LIFE OF RECOVERY EQUIPMENT

	Cartridge	Electrolytic unit
Amount of silver recovered (troy ounces)	a/ 35	b/ 1,260
Market value of silver (note c)	x $11 per troy ounce	x $11 per troy ounce
Total value of recovered silver	$385	$13,860
Cost of recovery equipment (note d)	-30	-700
Cost of refining	e/-15	f/ - 6
Cost of shipping (note g)	-13	- 22
Savings to Government per recovery unit	$327	$13,132

a/Although a cartridge can contain up to 60 troy ounces of silver, DOD's experience shows an average of 35 troy ounces per cartridge.

b/The 1,260 troy ounces recovered from electrolytic processing is based on 70 gallons of fixer per month (this is the minimum usage required by DOD for installing electrolytic equipment) for 5 years with an average recovery of 0.3 troy ounce of silver per gallon. Although over 1 troy ounce can be recovered from x-ray solutions, we chose a more conservative figure (0.3 troy ounce) only to demonstrate the effectiveness of recovery.

c/The market value of silver varied from $11 to $50 in 1980. Again, we chose the most conservative figure ($11) to demonstrate the benefits of recovery.

d/The cost of electrolytic equipment in Government facilities typically varies between $500 and $700, and the cost of cartridges varies from $26 to $30. The higher costs were used to make the most conservative return.

e/Refining in DOD was $14.85 per cartridge, but under the latest contract, the amount fell to $1.17 per cartridge. Again, we used the more conservative figure.

f/Refining costs for DOD silver flake at the New York Assay Office are 7 cents per pound. The $6.05 figure is based on 86.4 pounds of silver (1,260 troy ounces/14.5833 troy ounces per pound) times 7 cents per pound.

g/DOD shipping costs for silver recovery in 1980 averaged about 25 cents per pound. A used cartridge weighs about 50 pounds, and the recovered silver from the electrolytic unit weighs 86.4 pounds.

ADEQUACY OF SILVER RECOVERY IN SELECTED CIVIL AGENCIES

Department/Agency	Size of Laboratory (note a)	Effective Recovery	Partially Effective	Not Effective	Comments
Department of Agriculture					
Forest Service					
Denver, Col.	600		X		Cartridge was not effectively recovering silver.
Rosslyn, Va.	1,200		X		Several sinks were not connected to recovery unit.
Headquarters, Washington, D.C.	1,080			X	Cartridges were connected 2 years ago during original installation but never changed.
Department of Commerce					
National Oceanic and Atmospheric Administration					
Redwood City, Cal.	18			X	No recovery.
Environmental Protection Agency					
Headquarters, Washington, D.C.	234			X	Two small labs dump used fixer.
General Services Administration					
New York, N.Y.	144			X	No recovery.
Washington, D.C.	87		X		Manual lab dumps used fixer and automatic processors use cartridges.
Archives					
Denver, Col.	15	X			
San Bruno, Cal.	Unknown	X			Fixer shipped to DOD in bulk containers.
Washington, D.C.	2,004		X		Two processors were not connected to recovery units.
Government Printing Office					
Denver, Col.	330	X			
New York, N.Y.	15			X	No recovery from fixer. Film negatives collected for sale.
San Francisco, Cal.	72			X	No recovery from fixer. Film negatives collected for sale.
Washington, D.C.	36,000		X		Broken electrolytic unit caused some dumping.
Department of the Interior					
Bureau of Land Management					
Denver, Col.	144	X			
Bureau of Mines					
Denver, Col.	162			X	
National Park Service					
Denver, Col.	300	X			
Geological Survey					
Denver, Col.	1,560		X		
Reston, Va.	7,200		X		One film processor was not connected to cartridges. Bent pipe caused dumping of 100 gallons of fixer a month.

APPENDIX II

ADEQUACY OF SILVER RECOVERY IN SELECTED CIVIL AGENCIES

Department/Agency	Size of Laboratory	Effective Recovery	Partially Effective	Not Effective	Comments
Menlo Park, Cal.	4,800	X			
Water and Power Resources Service	696		X		
Department of Health and Human Services					
Public Health Service					
New York, N.Y.	960	X			
San Francisco, Cal.	2,268	X			
Department of Justice					
Bureau of Prisons					
San Francisco, Cal.	120			X	Lab waiting for GSA to provide service.
Federal Bureau of Investigation					
New York, N.Y.	4,000	X			
Department of Transportation					
Coast Guard					
New York, N.Y.	264			X	Lab planning to install equipment.
San Francisco, Cal.	240		X		Manual lab dumping fixer.
Federal Aviation Administration					
Denver, Col.	2			X	
New York, N.Y.	55		X		Photo lab does not recover but medical lab does.
Department of the Treasury					
Alcohol, Tobacco, and Firearms					
San Francisco, Cal.	72			X	No recovery.
Bureau of Public Debt					
Parkersburg, W. Va.	120			X	No recovery.
Washington, D.C.	414			X	No recovery.
Customer Service					
New York, N.Y.	130			X	No recovery.
San Francisco, Cal.	3			X	No recovery.
Bureau of Engraving and Printing					
Washington, D.C.	199		X		Automatic processors are on GSA recovery contract while manual lab dumps fixer.
Internal Revenue Service					
Brookhaven, N.Y.	98			X	No recovery.
Washington, D.C.	96			X	No recovery because GSA contractor declined service.

APPENDIX II

ADEQUACY OF SILVER RECOVERY IN SELECTED CIVIL AGENCIES

	Size of Laboratory	Effective Recovery	Partially Effective	Not Effective	Comments
Postal Service					
New York, N.Y.	55		X		One lab dumps and one recovers.
San Bruno, Cal.	61			X	No recovery.
Washington, D.C.	624			X	No recovery at three small labs in same building.
Veterans Administration					
Denver	2,880	X			
North Port, N. Y.	4,168	X			
San Francisco, Cal.	4,968	X			
Washington, D.C.	5,984		X		

a/Gallons of fixer used annually.

APPENDIX II

AGENCY COMMENTS

The Government Printing Office did not want its photographic laboratories in New York and San Francisco classified as "not effective." The New York Government Printing Office laboratory did not believe it had enough photographic solution to justify recovery costs. However, as in many cases, its small laboratory is located close to another agency's laboratory which does recover silver (see ch. 2). We suggested that the New York laboratory carry its photographic solutions next door to PHS for recovery in an existing program. The San Francisco Government Printing Office stated that GSA would not sell its 300 gallons of photographic solutions. However, the San Francisco GSA claimed that, although it was not aware of any contact from the Printing Office, GSA would sell the photographic solution. We gave the Printing Office the names of GSA officials to contact in San Francisco. The Printing Office could also have contacted DOD for proper recovery as PHS did in San Francisco. Since the Printing Office was dumping silver when recovery alternatives were available, we continued to classify its efforts as "not effective."

The Bureau of Engraving and Printing did not want its laboratory classified as "partially effective" since only small amounts of silver were occasionally dumped from some of the laboratory equipment, and silver was being recovered from other equipment. However, Engraving could have collected the photographic solution that was being dumped and turned it over to DOD for recovery. DOD will provide civil agencies with free plastic containers for this collection. We continue to classify its laboratory as only "partially effective."

Several other agencies mentioned they initiated corrective actions after our visits. However, we kept the classifications according to the effectiveness of their programs at the time of our review to demonstrate the potential that probably exists in other photographic laboratories that were audited.

APPENDIX III

DEFENSE LOGISTICS AGENCY
HEADQUARTERS
CAMERON STATION
ALEXANDRIA, VIRGINIA 22314

IN REPLY
REFER TO DLA-SIP

22 MAY 1981

Mr. H. W. Conner
Senior Associate Director
Procurement, Logistics and Readiness
Division
General Accounting Office
441 G Street, NW
Room 5832
Washington, DC 20542

Dear Mr. Conner:

This is in response to your letter to the Honorable Casper W. Weinberger, Secretary of Defense, regarding GAO Report dated 22 April 1981 entitled "Civil Agencies Still Need to Recover More Silver from Photographic Wastes", (GAO Code 943076) (OSD Case #5695).

The enclosed comments to your report are provided on behalf of the Secretary of Defense.

Sincerely,

ROBERT C. GASKILL
Major General, USA
Deputy Director

Encl

APPENDIX III

DEFENSE LOGISTICS AGENCY (DLA) RESPONSE
TO GAO REPORT RECOMMENDATIONS

"CIVIL AGENCIES STILL NEED TO RECOVER
MORE SILVER FROM PHOTOGRAPHIC WASTES"
(GAO CODE 943076) (OSD CASE #5695)

Recommendation:

1. To provide clear program direction and insure reasonable internal control standards, the GAO recommends that - The Administrator of General Services revise the Federal Property Management Regulations to clearly make silver recovery a mandatory program in those cases where it is cost effective.

Concur - The Department of Defense (DoD) currently administers and operates its program within the scope and parameters of the recommendation.

Recommendation:

2. To insure effective silver recovery, the GAO recommends that the head of each agency - Include effective silver recovery as a performance objective for evaluating management officials having responsibility for photographic labs.

Concur with the intent of the Recommendation - Although this recommendation is not directed to the DoD, it is being addressed, at least in part, within the DoD.

Recommendation:

3. To insure effective silver recovery, the GAO recommends that the head of each agency - Require periodic internal audits of photographic operations to identify waste and poor internal controls.

Concur - The DoD currently administers and operates its program within the scope and parameters of the recommendation.

Recommendation:

4. To insure effective silver recovery, the GAO recommends that the head of each agency - Join the Department of Defense (DoD) Precious Metals Recovery Program if their photographic labs are not effectively recovering silver and thereby prevent further (civil agency) dumping of a valuable resource (silver) and save money be reducing future procurement costs.

Concur in general - The Civil Agencies are authorized to participate in the Department of Defense Precious Metals Recovery Program, subject to DoD and GSA approval. Currently, a number of civil agencies are participating, in whole or in part, in the DoD program. Informal arrangements have been made with a number of Civil Agencies permitting the collection and turn-in of hypo solution,

APPENDIX III

cartridges or flake. In some cases the support includes the providing of cartridges or other recovery equipment for purpose of silver recovery. In other cases, greater involvement and services, surveys and equipment are being provided under terms of formal agreements which are in effect with the National Aeronautics and Space Administration (NASA), the Department of Justice (DOJ) and others. As part of the program fine precious metals are issued to Civil Agencies from DoD stocks for use as government furnished materials in new procurement. For the year ending 31 March 1981 the silver issued to meet Civil Agency requirements amounted to approximately one percent of the total silver issues made.

The Department of Defense will continue to support and involve the Civil Agencies in their silver recovery operations to the extent it can do so without adversely impacting DoD personnel resources. The extent the recommendation is implemented and the number of Civil Agencies which will seek participation in the DoD Program are factors which will have a bearing on the kinds of support which can be provided. The providing of appropriate turn-in points for precious metals bearing materials and, for the most part, the acquisition and issuance of recovery equipment to Civil Agency generators will not be a problem. In those cases where the services desired or required exceed those which can be provided, the involvement will have to be limited to what can be accomplished within existing resources and formalized with appropriately tailored Memorandums of Agreement. However, if there is an interest or move to include most of the Civil Agencies in the DoD Program and the same kinds of services which are provided to DoD facilities, such as facility surveys by DLA Precious Metals Area Representatives and surveillance visits are required, resource adjustments would have to be made for the expanded mission.

General
Services
Administration

RECEIVED
GAO - INDEX & FILES

1981 MAY 22 AM 10 08

Honorable Milton J. Socolar
Acting Comptroller General
United States General Accounting Office
Washington, DC 20548

Dear Mr. Socolar:

Thank you for the opportunity to comment on the General Accounting Office (GAO) draft report to the Congress entitled "Civil Agencies Still Need to Recover More Silver from Photographic Wastes."

We are in general accord with the findings and recommendations. With respect to the recommendation to the General Services Administration (GSA), we will evaluate the section of the Federal Property Management Regulation (FPMR) which pertains to the silver recovery program to ascertain how we may stress its mandatory nature and clarify the issue of economic feasibility in silver recovery operations.

The recommendations to the heads of civil agencies are excellent and we urge that GAO distribute the final report so as to maximize the benefits which will accrue to the Government upon implementation of these recommendations. We suggest that GAO's final report require civil agencies to respond by providing GSA a summary of actions completed or planned to implement the recommendations. This summary could be included with the agencies' semiannual "Report of Activities Generating Precious Metals" due for submission to GSA by November 15, 1981.

Since 1965, when GSA took the initiative in promoting silver recovery throughout the Government, we have had a close working relationship with the Department of Defense (DOD). We recognized early that DOD, because of its existing organizational structure and its network of generating activities which blanket the country, would have to establish facilities and a technical capability to support their recovery operation. It is for this reason that GSA refrained from duplicating DOD's program and developed procedures permitting civil agencies to participate in the Defense Precious Metals Recovery Program. These procedures were incorporated into the FPMR in July 1975.

Our primary concern with the report is that it appears to convey the impression throughout, that GSA and DOD are in competition in the silver recovery arena. A prime example is the table on pages 28 and 29 comparing

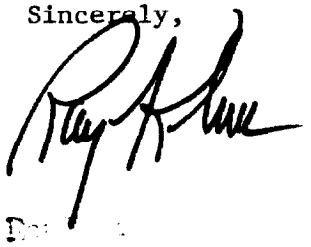
APPENDIX IV

silver recovery services offered by GSA and DOD which is included under the subtitle "DOD Offers Civil Agencies More Services Than GSA." We agree that GAO should make civil agencies aware of the functions of both GSA and DOD in the silver recovery program, and this has been done in separate sections of the report. The table will serve its intended purposes as a summary of DOD services but it should be modified to exclude the GSA portion.

GSA's functions in the silver recovery area are to issue pertinent regulations which apprise civil agencies of their responsibilities and options; to monitor agency efforts through a semiannual reporting system; to publish informational materials such as pamphlets and FPMR bulletins for agency guidance; and, to provide term contracts for silver recovery when civil agencies make their requirements known to us. GSA will continue to execute its responsibilities in the future to the extent resources permit.

The above and other points were discussed with your representatives on May 6, 1981.

Sincerely,



Dan

APPENDIX V

Office of the
Administrator
of Veterans Affairs

Washington, D.C. 20420

Veterans
Administration

MAY 22 1981

Mr. H. W. Connor
Senior Associate Director
Procurement, Logistics and Readiness Division
General Accounting Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Connor:

Thank you for the opportunity to review your April 22, 1981 draft report, "Civil Agencies Still Need to Recover More Silver From Photographic Wastes," which states that many Government agencies continue to waste money and a valuable natural resource by discarding silver-laden photographic wastes. The General Accounting Office states that by using inexpensive and easy to operate equipment, silver that is now being poured down the drain could be recovered. The report states that in 1980, the Veterans Administration (VA) sold recovered silver at a return of $74 for every $1 spent.

In this report, you recommend that the General Services Administration revise the Federal Property Management Regulations to make silver recovery a mandatory program for Government agencies.

We agree with this recommendation. Responsibility for silver recovery in this Agency has been delegated to the Assistant Administrator for Supply Services and is documented in VA manual MP-2, Subchapter H, Subpart 108-42.3, "Recovery of Precious Metals and Critical Materials."

To insure effective silver recovery, you recommend that the head of each civil agency

--include effective silver recovery as a performance standard for evaluating management officials having responsibility for photographic labs;

We concur in this recommendation and will take steps to implement it.

--require periodic internal audits of the agency's photographic laboratories to identify waste and poor internal controls; and

--instruct internal audit groups to perform periodic reviews to insure that internal controls are instituted and maintained.

We concur in these recommendations. During visits to our medical centers, Supply Services representatives routinely check to insure that the silver

APPENDIX V

Mr. H. W. Connor

recovery units are operating efficiently, and initiate appropriate corrective actions as necessary. As reported in Chapter 5, section entitled, "Additional Internal Audits Needed," the Inspector General's Office of Audit reviewed the overall VA silver program in 1979. The report contained data from 15 medical centers. During the past 2 years, cyclical audits have developed additional silver recovery findings at 13 medical centers and 1 supply depot. The silver recovery program will be continually reviewed to insure that adequate internal controls are instituted and maintained.

I believe the VA has an effective silver recovery program, and we are actively working to improve it. In this respect, we now require the conversion from individual recovery units on each x-ray film processor to centralized collection and processing, with all waste fixer solution maintained in a secured room. We believe this greatly reduces the possibility of pilferage and insures maximum silver recovery. This requirement applies to all renovation and new construction projects.

We appreciate GAO's complimentary remarks about the VA's silver recovery program, and the opportunity to review and comment on this report.

Sincerely,

RUFUS H. WILSON
Acting Administrator

APPENDIX VI

DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of Inspector General

Washington, D.C. 20201

22 MAY 1981

Mr. H.W. Connor
Senior Associate Director
Procurement, Logistics and
Readiness Division
United States General
Accounting Office
Washington, D.C. 20548

Dear Mr. Connor:

The Secretary asked that I respond to your request for our comments on your draft report entitled, "Civil Agencies Still Need to Recover More Silver from Photographic Wastes." The enclosed comments represent the tentative position of the Department and are subject to reevaluation when the final version of this report is received.

We appreciate the opportunity to comment on this draft report before its publication.

Sincerely yours,

Bryan B. Mitchell
Acting Inspector General

Enclosure

Department of Health and Human Services Comments on GAO's Draft Report, "Civil Agencies Still Need to Recover More Silver from Photographic Wastes"

GENERAL COMMENTS

The Department had recognized the importance of the silver (and other metal) reclamation programs, long before GAO issued its earlier report. In 1975 ASMB required Departmental components to conduct reclamation surveys, and establish a precious metals and critical materials reclamation program.

Accordingly, PHS (the Department's ultimate manufacturer of reclaimed precious metals) has established a vigorous program yeilding 20,823 troy ounces of reclaimed silver last year. This amounts to over $200,000 in recycled assets.

GAO Recommendation
To insure effective silver recovery, the head of each civil agency include effective silver recovery as a performance objective for evaluating management officials having responsibility for photographic labs.

Department Comment
This recommendation has been forwarded to the Department's Assistant Secretary for Personnel Administration for review and consideration.

GAO Recommendation
That the head of each civil agency require periodic internal audits of photographic operations to identify waste and poor internal controls.

Department Comment
We concur. During the past fiscal year, the HHS Inspector General's Audit Agency conducted a limited survey of silver reclamation at the National Institute of Health (NIH). We noted no significant deficiencies.

GAO Recommendation
That those agencies not effectively recovering silver from photographic wastes join the DOD precious metal recovery program. This should prevent further dumping of a valuable resource and save money by reducing future procurement costs.

Department Comment
We concur. Presently, PHS voluntarily participates in DOD's recovery program on a limited basis. However, in an effort to achieve greater recovery within HHS, PHS plans to enter into an agreement with DOD for participation in its silver recovery program on a nation-wide basis. They expect to have operational plans developed and implemented during this calendar year which will include in the program all PHS activities with silver recovery potential.

APPENDIX VII

U.S. Department of Justice

MAY 26 1981

Washington, D.C. 20530

Mr. H. W. Connor
Senior Associate Director
Procurement, Logistics and Readiness Division
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Connor:

This letter is in response to your request to the Attorney General for the comments of the Department of Justice (Department) on your draft report entitled "Civil Agencies Still Need To Recover More Silver From Photographic Wastes."

The Department agrees with the overall recommendation of the report that silver recovery systems should be implemented in those cases where it is cost effective. In this regard, the report fails to point out that the initiatives of Justice were a "first" among civilian agencies (except for the Veterans Administration which has specific authority to retain the proceeds from the sale of silver) to recognize the benefits of silver recovery and actively encourage and monitor silver operations. The General Services Administration and the Department of Defense (DoD) commended the Department for its efforts. The Department joined the DoD precious metal recovery program in September 1980. Although the report cites only the two major silver recovery programs in the Department relating to the Federal Bureau of Investigation (FBI) and the Bureau of Prisons (BoP), all organizational elements of the Department generating silver-laden photographic wastes are required by Departmental policy to participate in the DoD silver recovery program. In a few instances, these programs are just getting underway.

The FBI has actively encouraged and supported a silver recovery program and is effectively recovering silver. However, because of the FBI's investigative application of photography, the materials used are either evidentiary or classified in nature, and very little is considered to be routine scrap. As a result, the FBI's main silver recovery thrust is through the used hypo solution. Overall, the FBI's silver recovery program is not considered of such significance as to warrant development of a separate performance standard under the performance appraisal system. Instead, the FBI monitors its silver recovery program through the overall supervision and management of its photographic facilities.
(See GAO note, p. 49.)
Pursuant to the Department's silver recovery program with DoD, the BoP has notified DoD of the names of personnel to contact at those field facilities where silver derivative photographic processes are employed. DoD personnel have begun contacting the facilities and are currently establishing specific recovery procedures. The vast majority of commercial

recovery contracts have been terminated. The remainder will be terminated upon expiration of the contract, but no later than January 31, 1982. Management personnel have been informed of the DoD agreement and their responsibilities thereunder.

Federal Prison Industries (FPI) has undertaken an independent recovery program to reclaim silver generated from their print plant operations. They have purchased inexpensive recovery equipment similar to that described in the GAO report. Because of FPI's unique position as a wholly owned Government corporation, they will be able to derive financial benefit from the silver recovery operation while coincidentally conserving a valuable resource.

In lieu of developing performance standards under the performance appraisal system to ensure silver recovery, BoP and FPI require the BoP Regional Hospital Administrators and the FPI Graphics Division auditors to periodically review and report on the effectiveness of the program in their respective audit reports.

In addition to the above controls instituted by the respective organizations, the Departmental Internal Audit Staff will perform periodic internal audits of photographic operations to identify waste or poor management of silver recovery operations. The audits will be conducted either as a comprehensive audit of the silver recovery program or as an integral part of an administrative audit of those Departmental organizations having silver recovery operations.

On page 27 of the report, the statement is made that "Several civil agencies are now negotiating contracts with film manufacturers so that future film purchases will be offset by silver supplied by DoD." The FBI is interested in obtaining further details on the specifics of this program and will contact the General Accounting Office auditors in the near future as to its possible application to the FBI. Such a program may provide an added incentive to encourage maximum recovery of silver.

We appreciate the opportunity to comment on the draft report. Should you desire any additional information, please feel free to contact me.

Sincerely,

for Kevin D. Rooney
Assistant Attorney General
for Administration

GAO Note: This recommendation was modified to allow agencies flexibility in selecting means to emphasize to laboratory managers the importance of silver recovery.

APPENDIX VIII

National Aeronautics and
Space Administration

Washington, D.C.
20546

Reply to Attn of: L

MAY 1981

Mr. H. W. Connor
Senior Associate Director
Procurement Logistics and
Readiness Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Connor:

Thank you for the opportunity to review the GAO draft report entitled, "Civil Agencies Still Need to Recover More Silver from Photographic Wastes," Code 943076.

NASA concurs with the report recommendations. Our specific comments are provided in the enclosure to this letter.

Sincerely,

Gerald D. Griffin
Acting Associate Administrator
for External Relations

Enclosure

APPENDIX VIII

NASA Comments on GAO Report "Civil Agencies Still Need to Recover More Silver From Photographic Wastes".

NASA concurs with the recommendations to the heads of Government Agencies contained on page iv of the Digest. The unsigned Memorandum of Understanding between Defense Logistics Agency (DLA) and NASA discussed on page 30, was signed on March 18, 1981. DLA will survey the Wallops Flight Center in May 1981, and plansto survey the other NASA installations by the end of FY 1981.

Wm. E. Lilly
Associate Administrator
Comptroller

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

22 MAY 1981

OFFICE OF
PLANNING AND MANAGEMENT

Mr. H. W. Connor
Senior Associate Director
Procurement, Logistics and Readiness Division
Room 5832
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Connor:

The Environmental Protection Agency (EPA) has reviewed the General Accounting Office (GAO) draft report entitled "Civil Agencies Still Need To Recover More Silver From Photographic Wastes."

The Agency strongly shares the concern for recovery of silver from photographic wastes as discussed in the draft report. EPA currently recovers a significant amount of silver from photographic waste at our installations. To further expand the recovery of silver, we are investigating the possibility of joining an ongoing federal agency metal recovery program.

Through the Property and Supply Management Section of the General Services Branch, a report on activities generating precious metals is submitted to the General Services Administration twice during the fiscal year. This report, compiled at Headquarters, is based on information obtained from the regions and major laboratories through Property Management Offices.

An analysis of previous reports indicates that over 80 percent of EPA's silver generated from photographic waste occurs at the Vint Hill Farm Station, Warrenton, Virginia. The Agency recovers all the silver from scrap film and hyposolution, and it is then sent to a Department of Defense (DOD) facility at Colts Neck, New Jersey, for additional processing. Other EPA facilities generating silver from photographic waste collect and recover silver depending on available equipment.

EPA has contacted the Defense Property Disposal Service, a Department of Defense facility, concerning additional EPA silver recovery. This facility agreed to review the Agency's next precious metal report and comment on the feasibility of EPA's joining the DOD precious metals recovery program. This potential recovery program is in alignment with the draft report.

The Agency agrees with the draft report, which states that internal audits should be conducted on photographic operations. However, the frequency of audits depends on available resources and priority considerations within the audit operation.

We appreciate the opportunity to comment on the draft report prior to its issuance to Congress.

Sincerely yours,

Roy N. Gamse
Acting Assistant Administrator
for Planning and Management

DEPARTMENT OF AGRICULTURE
OFFICE OF ASSISTANT SECRETARY FOR ADMINISTRATION
WASHINGTON, D.C. 20250

MAY 28 1981

Mr. H. W. Connor
Senior Associate Director
Procurement, Logistics and
Readiness Division
General Accounting Office
Washington, DC 20548

Dear Mr. Connor:

We have reviewed the GAO draft report entitled "Civilian Agencies Still Need to Recover More Silver From Photographic Wastes" and have the following comments:

1. We concur with all of the recommendations listed on page IV.

2. We disagree with the statement on page 16, Case Study - Department of Agriculture, that the Department "...became seriously interested in silver recovery..." as the result of the internal (Office of the Inspector General) audit. The Office of Operations and Finance's (O&F) Personal Property Management Division actually took the initiative in program development following the GAO's 1977 study. The Office of the Inspector General audit occurred subsequently and at a very early stage of the program's creation.

3. On page 14, the last sentence should be changed to read "thirty-five labs...."

4. Appendix II lists the Forest Service Lab in "Reston, Virginia." That should be changed to "Rosslyn, Virginia."

5. Appendix II also lists "Headquarters, Washington, D.C." That should be changed to the "Office of Governmental and Public Affairs."

We appreciate the opportunity to comment on this report.

Sincerely,

Joan S. Wallace

JOAN S. WALLACE
Assistant Secretary
for Administration

APPENDIX XI

United States
Government
Printing Office
Washington, D.C. 20401

OFFICE OF THE PUBLIC PRINTER

May 11, 1981

Mr. Henry W. Connor
Senior Associate Director
Procurement, Logistics and Readiness Division
Room 5832
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Connor:

As requested in your letter of April 22, 1981, we have reviewed GAO's draft report "Civil Agencies Still Need To Recover More Silver From Photographic Wastes" (943076), and offer the following response to the comments in Appendix II of the report:

New York Field Printing Office

The New York Office uses only 15 gallons of fixer annually. Since the costs associated with recovering such a small volume would outweigh the benefits, we ask that your comment of "not effective" be either deleted from the report or changed to indicate the correct nature of the operation.

San Francisco Field Printing Office

In October 1980, the San Francisco manager contacted GSA and was told that "GSA could not sell 300 gallons of hypo." Therefore, we ask that your comments be deleted, or modified as appropriate to indicate a situation beyond the control of this Office.

I would like to thank you for the opportunity to comment on the draft report, and hope that you consider our comments before issuing the final report.

Sincerely,

SAMUEL L. SAYLOR
Acting Public Printer

APPENDIX XII

DEPARTMENT OF THE TREASURY
WASHINGTON, D.C. 20220

ASSISTANT SECRETARY

MAY 22 1981

Dear Mr. Connor:

On behalf of the Secretary, I am pleased to comment on the draft report, "Civil Agencies Still Need to Recover More Silver from Photographic Wastes." Four Treasury bureaus and the Office of the Inspector General have reviewed the draft; written comments received from three bureaus are provided. The Bureau of Alcohol, Tobacco and Firearms, the Bureau of the Public Debt and the Internal Revenue Service have indicated initiation of action to recover silver or to assess alternative recovery means. I have requested that my Office of Administrative Programs review the Engraving and Printing program which you have classified as partially effective. In addition, I plan to monitor closely the silver recovery program in the future. Treasury bureau head auditors have been notified to consider these matters in their audit plans.

Cora P. Beebe
Assistant Secretary
(Administration)

Mr. H.W. Connor
Senior Associate Director
Procurement, Logistics
and Readiness Division
441 G. Street N.W., Room 5832
Washington, D.C. 20548

cc: Ed Brooks

APPENDIX XII

memorandum

Department of the Treasury, Bureau of the Public Debt

DATE: MAY 15 1981

TO: Cora P. Beebe
Assistant Secretary (Administration)

FROM: Eleanor J. Holsopple
Assistant Commissioner (Administration)

SUBJECT: GAO Draft Report - "Civil Agencies Still Need To Recover More Silver from Photographic Wastes"

The Bureau of the Public Debt offers the following comments concerning the subject report.

This Bureau is presently initiating action to begin recovery of silver from fixer and scrap film from the two small labs in Washington mentioned on page 18 of the report.

With respect to the lab in Parkersburg, W. Va., mentioned in appendix II, the "no recovery" statement is no longer accurate. Fixer solution is now picked up for recovery of silver by a GSA-approved vendor. In addition, a GSA-approved vendor is also recovering the silver from microfilm records no longer required to be maintained, because of regulatory changes, and from microfilm waste incurred in everyday microfilming operations.

Eleanor J Holsopple

APPENDIX XII

DEPARTMENT OF THE TREASURY
BUREAU OF ENGRAVING AND PRINTING
WASHINGTON, D.C. 20228

May 21, 1981

MEMORANDUM TO: Ms. Cora P. Beebe
Assistant Secretary, Administration

THRU: Miss Angela M. Buchanan
Treasurer of the United States

FROM: Harry R. Clements
Director

SUBJECT: GAO Draft Report "Civil Agencies Still Need To Recover More Silver From Photographic Wastes"

In the May 1, 1981 memorandum to you from the Deputy Inspector General (Audit), a coordinated response to the GAO draft report was suggested. The Bureau's position on the report recommendations are submitted for your consideration in the Department's response.

The Bureau of Engraving and Printing was the only Departmental agency which was determined by GAO to have a recovery operation. The Bureau uses a GSA contractor recovery service to automatically recover silver from used film processing solution. GAO's evaluation of our program was classified as only partially effective because small amounts of the solution are occasionally dumped in facilities other than the automatic processor. The automatic processors used are not designed to process the different types of solution that are being dumped and the volume generated is not sufficient to make it economically feasible to install additional processors. Environmentally, there are no pretreatment guidelines for disposal of photoprocessing wastes to municipal sewer systems.

Because the Bureau has an effective recovery system installed, I do not believe it is appropriate to include effective silver recovery as a specific performance objective in evaluating management officials responsible for the Bureau photographic activities. (See GAO note below.)

The head of the Bureau's internal audit function will consider periodic audits of photographic operations in establishing audit's long range and annual plans.

cc: Deputy Inspector General
(Audit)

GAO Note: This recommendation was modified to allow agencies flexibility in selecting means to emphasize to laboratory managers the importance of silver recovery.

APPENDIX XII

OFFICE OF
THE DIRECTOR

DEPARTMENT OF THE TREASURY
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS
WASHINGTON, D.C. 20226

15 MAY 1981

MEMORANDUM TO: Assistant Secretary
(Administration)

FROM: Director

SUBJECT: GAO Draft Report "Civil Agencies Still Need to Recover More Silver From Photographic Wastes"

This is in response to the May 1 memorandum to you from the Deputy Inspector General (Audit) which indicated that your office would be coordinating Bureau comments on the subject GAO draft report.

While we recognize that the only reference to ATF is contained in Appendix II to the report, please be advised that the Bureau is assessing alternatives available for recovering metallic silver from fixer solutions used in our photographic laboratories. Bureau managers responsible for photographic laboratories will be charged with developing an effective silver recovery program appropriate to their geographic location and laboratory size. In addition, the Internal Audit Division, Office of Internal Affairs will consider including audit coverage of silver recovery activities in their annual and long-range audit plans.

We appreciate the opportunity to comment on the subject draft report. If there are any questions or if we can be of further assistance, please advise.

G. R. Dickerson

APPENDIX XIII

UNITED STATES DEPARTMENT OF COMMERCE
Office of Inspector General
Washington, D.C. 20230

May 20, 1981

Mr. H. W. Connor
Senior Associate Director
Procurement, Logistics and
Readiness Division
441 G Street, N. W. - Room 5832
Washington, D. C. 20548

Dear Mr. Connor:

In response to the GAO draft report on silver recovery in civil agencies, we have reviewed the attached comments from various Departmental offices and find them responsive.

The Department of Commerce, as you know, is already expending a considerable effort in recovering silver from those operations that use it.

As your report indicates the Department of Defense (DOD) operates a comprehensive and cost effective silver recovery program available to civil agencies. The Bureau of the Census has recently signed an agreement with the DOD regarding their precious metals recovery program. The National Oceanic and Atmospheric Administration (NOAA) concurs that a silver recovery system is beneficial and will review their operations to determine the most efficient and effective recovery system to implement.

The report also recommended that periodic reviews be made by the agencies' internal audit groups to ensure that internal controls are instituted and maintained. The Office of Inspector General (OIG) has performed similar audits in the past and is considering performing more in the future. We believe the actions taken and planned should strengthen the silver recovery program within the Department.

Sincerely,

Frederic A. Heim, Jr.
Assistant Inspector General
for Auditing

Enclosure

APPENDIX XIII

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Administration
Washington, D.C. 20230
Office of Publications - Room 2852

April 28, 1981

Mr. H.W. Connor
Senior Associate Director
Procurement, Logistics
and Readiness Division
441 G Street, N.W. - Room 5832
Washington, D.C. 20548

Dear Mr. Connor:

I have been asked to respond to your letter of April 22, 1981 to Secretary of Commerce Malcolm Baldrige.

We have read the GAO draft report on silver recovery in civil agencies and concur that an effective recovery program is beneficial to the Government.

The Department of Commerce, as you know, is already expending a considerable effort in recovering silver from its photography labs.

We would have no difficulty in complying with the recommendations contained in the draft.

Sincerely,

John F. Doherty
Deputy Director
Office of Publications

APPENDIX XIII

UNITED STATES DEPARTMENT OF COMMERCE
Bureau of the Census
Washington, D.C. 20233

OFFICE OF THE DIRECTOR

MAY 15 1981

MEMORANDUM FOR Arlene Triplett
Assistant Secretary-designate
for Administration

Through: William A. Cox WAC
Acting Chief Economist
for the Department of Commerce

From: Daniel B. Levine
Acting Director
Bureau of the Census

Prepared by: JDLincoln/Census/ChEc/763-7980

Subject: GAO Draft Report "Civil Agencies Still Need to Recover More Silver From Photographic Wastes"

The Bureau of the Census has recently signed an agreement with the Department of Defense (DOD) regarding their precious metals recovery program. Although DOD has not given final approval to the agreement, Census processing centers at Laguna Niguel, California, and New Orleans, Louisiana, have already made delivery of silver to the local Defense Property Disposal Offices (DPDO).

Census headquarters is continuing to use the General Services Administration's (GSA) precious metals recovery program until DOD signs the agreement.

The following amounts of silver-bearing materials have been turned in:

Processing Office	DPDO	Item	Weight (Pounds)
Laguna Niguel, California	El Toro Marine Corps Station California	Metallic Replacement Cartridge (2)	54.81
"	"	Silver Flakes	41.3
"	"	Scrap Film	3276.0
New Orleans, Lousiana	Keesler Air Force Base, Mississippi	Silver Flakes	47.0
"	"	Scrap Film	1658.5

The Jeffersonville Processing Office's silver-bearing materials are collected by the Data Preparation Division (DPD) and turned in to the DPDO at Fort Knox, Kentucky. (The materials are commingled with those of DPD.)

Additional comments on the GAO draft report are as follows:

--The reference on page 31 should be expanded to refer to the census recovery program at all three processing locations.

--Approximately $15,000 was saved by the Bureau on a recent purchase of microfilm for the sample microfilming operation by providing the vendor with silver requisitioned from the DOD. The Bureau, as a participating member of the DOD silver recovery program, is authorized this privilege.

--A provision whereby the silver recovery system would be installed at no cost or at minimal cost to the participating agency would make the silver recovery program more attractive.

--The provision granted to VA, whereby they are authorized to keep the money from the recovery in a revolving fund which offsets the cost of medical supplies, would be an even more attractive incentive.

--It is considered that the silver recovery program is a worthwhile program and should receive wholehearted support at all levels of management.

cc:
William A. Cox

APPENDIX XIV

THE POSTMASTER GENERAL
Washington, DC 20260

May 20, 1981

Dear Mr. Connor:

Thank you for sending us your draft report entitled, "Civil Agencies Still Need to Recover More Silver From Photographic Wastes."

We are now looking into the various approaches to silver recovery discussed in your report and will follow whatever course of action proves best from a cost/benefit standpoint.

Sincerely,

William F. Bolger

Mr. H. W. Connor
Senior Associate Director
Procurement, Logistics
and Readiness Division
U.S. General Accounting Office
Washington, D.C. 20548

APPENDIX XV

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

JUN 2 1981

Mr. H. W. Connor
Senior Associate Director
Procurement, Logistics and Readiness Division
441 G Street, N.W. - Room 5832
Washington, D.C. 20548

Dear Mr. Connor:

We have reviewed the letter from the Director, General Accounting Office, dated April 22, 1981 enclosing GAO Draft Report, "Civil Agencies Still Need to Recover More Silver from Photographic Wastes."

The report has also been reviewed by the Bureau of Mines, Bureau of Indian Affairs, U.S. Geological Survey, and the Water and Power Resources Service. Their responses are enclosed.

Other Bureaus and Offices of the Department of the Interior are examining their potential for silver recovery programs and will comment to the Office of Acquisition and Property Management, Division of Property Management, by June 30, 1981.

The Office of the Inspector General will review the report and consider including the silver recovery program in the internal audit program.

Sincerely,

Deputy Assistant Secretary
Policy, Budget and Administration

Enclosures

APPENDIX XV

UNITED STATES GOVERNMENT

memorandum

DATE: MAY 28 1981

REPLY TO ATTN OF: Chief, Division of Property Management (BIA)

SUBJECT: GAO Draft Report "Civil Agencies Still Need to Recover More Silver from Photographic Wastes"

807

RECEIVED 5/28/81

TO: Chief, Division of Property Management (DOI)

We have reviewed the subject draft GAO Report and agree with the three recommendations to the heads of Government agencies as contained therein. We are currently developing a memorandum survey to determine the extent to which the first and third recommendations will require implementation by the Bureau. Appropriate implementing directives will be developed depending upon the results of that survey.

It is suggested that the second recommendation concerning internal audits be referred to the Department's Office of the Inspector General.

If you require further information in this matter, please contact Mr. James Harjo of this office on 235-2743.

Charles E. Carter
Chief, Division of Property Management

cc: Chron
File
650 (ATTN: George Lawlor)
J. Harjo

APPENDIX XV

Linda Kelley 801

United States Department of the Interior

WATER AND POWER RESOURCES SERVICE
WASHINGTON, D.C. 20240

7/24/81

IN REPLY
REFER TO: 921
320.4

21 MAY 1981

Memorandum

To: Director of Acquisition and Property Management

From: Chief, Division of Property and Paperwork Management

Subject: GAO Draft Report "Civil Agencies Still Need to Recover More Silver from Photographic Wastes"

This memorandum confirms an oral response to Mr. Gerald Dempsey of your staff to insure timely reply.

The subject GAO draft was discussed by telephone with our regional offices as a positive approach for strengthening our existing silver recovery program.

Bureau of Reclamation offices are now utilizing Department of Defense (DOD) recovery facilities and we will support and encourage further development of an Interior/DOD coordinated program.

Thank you for the opportunity to comment.

Merlin Coffey

APPENDIX XV

OFFICE OF THE DIRECTOR

United States Department of the Interior

BUREAU OF MINES
2401 E STREET, NW.
WASHINGTON, D.C. 20241

May 19, 1981

Memorandum

To: Director, Office of Administrative Services

From: Director, Bureau of Mines

Subject: GAO Draft Report, "Civil Agencies Still Need to Recover More Silver from Photographic Wastes"

The GAO Draft Report has been reviewed by the Bureau of Mines.

Comments for inclusion in your response are attached.

DEPUTY Director

Attachment

APPENDIX XV

United States Department of the Interior

BUREAU OF MINES
2401 E STREET, NW.
WASHINGTON, D.C. 20241

IN REPLY REFER TO:
EBM:MR:MRT

May 12, 1981

Memorandum

To: Ben A. Kornhauser, Research Center Operations

Through: Director, Research Center Operations

From: Director, Mineral Resources Technology

Subject: GAO Report, "Civil Agencies Still Need to Recover More Silver from Photographic Wastes"

Since the Bureau does not operate large photographic laboratories, we contribute little to the total problem addressed by GAO. Of all the Bureau offices, GAO only tested the Denver Research Center waste photographic solutions, and did not report the quantity of silver contained in their wastes. However, the table in Appendix II lists the Denver Research Center among those not effective in recovering silver. During an inhouse research study conducted a number of years ago, waste solutions from the College Park Metallurgy Research Center were tested and found to contain approximately 2 grams of silver per liter. If the Denver wastes are similar to those evaluated at College Park, Denver is discarding a total of approximately $475 per year at today's silver prices ($11.00). The small amount of silver in the Bureau's photo labs at Denver do not justify a very sophisticated silver recovery circuit; but considering the number of Government facilities in the Denver area, a central processing facility might merit investigation.

For your information, the Bureau conducted pioneering research in recovering silver from photographic wastes and published the results in the 1968 Report of Investigations 7117, "Silver Recovery From Waste Photographic Solutions by Metallic Displacement."

Ralph C. Kirby

Enclosures

APPENDIX XV

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VA. 22092

OFFICE OF THE DIRECTOR

MAY 18 1981

Memorandum

To: Director, ~~Office~~ of Budget

From: Acting Director, Geological Survey

Subject: GAO Draft Report, "Civil Agencies Still Need to Recover More Silver from Photographic Wastes"

The Geological Survey has reviewed the subject GAO draft report and has the following comments:

The Geological Survey recognizes the importance of an efficient silver recovery program and will continue to support efforts to collect precious metals.

Silver recovery activities have been improved in the National Mapping Division laboratories since the spot checks mentioned in the subject report. All identified discrepancies have been corrected, internal controls and audits have been strengthened, and their recovery equipment has been upgraded.

We concur with the general conclusions of the GAO Report, and especially feel that joining the DOD precious metals recovery system has significant advantages.

Doyle G. Frederick

Doyle G. Frederick

U.S. Department of Transportation
Office of the Secretary of Transportation

Assistant Secretary for Administration

400 Seventh Street, S.W.
Washington, D.C. 20590

MAY 27 1981

Mr. Henry Eschwege
Director, Community and Economic
Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Eschwege:

We have enclosed two copies of the Department of Transportation's (DOT) reply to the General Accounting Office (GAO) draft report, "Civil Agencies Still Need To Recover More Silver From Photographic Wastes," dated April 22, 1981.

DOT agrees with GAO that more can and should be done to recover silver. The number of DOT activities recovering silver has increased since 1977, but additional efforts need to be made. We believe that our recovery can be increased further by obtaining Department of Defense (DOD) assistance. Therefore, contacts will be made with DOD to determine specific assistance that can be provided to DOT activities. DOT activities not presently recovering silver and having limited recovery potential may be able to participate in the recovery program with DOD's aid.

The Department is concerned with the protection and control of precious metals. In this regard, the DOT Inspector General (IG) has recently issued a Management Advisory Memorandum to the Heads of DOT Operating Administrations emphasizing the need to exercise special controls over precious and other valuable metals. We concur with GAO's recommendation for periodic reviews of controls over recovery, storage, and disposal of precious metals. The IG has recently completed such a review within the U.S. Coast Guard.

If we can further assist you, please let us know.

Sincerely,

Robert L. Fairman

Enclosures

DEPARTMENT OF TRANSPORTATION REPLY TO GAO DRAFT OF A PROPOSED REPORT OF APRIL 22, 1981 ON CIVIL AGENCIES STILL NEED TO RECOVER MORE SILVER FROM PHOTOGRAPHIC WASTES

SUMMARY OF GAO FINDINGS AND RECOMMENDATIONS

The General Accounting Office (GAO) has found that many Government agencies continue to waste money and a valuable natural resource by discarding silver-laden photographic wastes. GAO states that agencies could recover silver, that in many cases is now being poured down the drain, by using inexpensive and easy to operate equipment in their photographic labs. GAO reviewed 44 Federal labs to determine efforts being made to recover silver. Of these labs, operated by 24 agencies, only 12 effectively recovered silver, 13 partially recovered and 19 did not recover silver at all. GAO found that collectively these labs annually dump about 6,500 troy ounces of silver worth $133,000 (market value as of September 30, 1980) down the drain.

In 1977 GAO identified similar problems in Federal agencies regarding failure to adequately recover silver. GAO has found that DoD has significantly improved its recovery effort since 1977. Further, GAO reports that DoD has expressed a willingness to advise and assist civil agencies in silver recovery operations.

GAO has reported that most civil agencies do not adequately recover silver from photographic wastes because:

--they must expend time and money to recover but receive no direct benefit since proceeds from silver sales are normally returned to the Treasury;

--many lab personnel are not aware of the benefits of recovery;

--recovery of silver does not receive adequate emphasis by top management; and

--the General Services Administration (GSA) has not fully supported the recovery program.

To ensure effective silver recovery, GAO recommends that the head of each civil agency:

--include effective silver recovery as a performance objective for evaluating management officials having responsibility for photographic labs;

--require periodic internal audits of photographic operations; and

3. Recommendation: Join the DoD precious metals recovery program if photographic labs are not effectively recovering silver.

We agree with this recommendation. The number of DOT activities recovering silver over the past three or four years has increased; however, there appears to be potential for still further improvements. We plan to seek advice and assistance from DoD to determine the most effective and efficient ways to increase our recovery. In this regard, the USCG has already pursued DoD support in this area.

4. Recommendation. That internal audit groups perform periodic reviews to ensure that internal controls are instituted and maintained.

We agree with this recommendation. As stated in response to Recommendation 2 above, the DOT Office of Inspector General has completed an audit of the U.S. Coast Guard's controls over recovery, storage and disposal of precious metals. Further, on February 8, 1980, the Office of Inspector General issued a Management Advisory Memorandum to the Heads of DOT Operating Administrations emphasizing the need to exercise special controls over precious and other valuable metals.

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