MATERIEL DEVELOPER'S GU
FOR POLLUTION PREVENTION
Second Edition - 1994

ARMY ACQUISITION POLLUTION PREVENTION SUPPORT OFFICE

SECRETARY
INSTALLATIONS, LOGISTICS, AND

SECRETARY OF THE ARMY
RESEARCH, DEVELOPMENT, AND ACQUISITION

HEADQUARTERS - ARMY MATERIEL COMMAND

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ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

This second edition of the "Materiel Developer's Guide for Pollution Prevention" is intended to provide you, the Materiel Developer (MATDEV), with the up-to-date information you need to develop, implement, and manage an effective acquisition pollution prevention program. It is important to remember that pollution prevention is a component of the environmental analyses required by the National Environmental Policy Act (NEPA). Other important components of environmental and NEPA compliance activities may relate to pollution control technology applications or conservation programs. However, you will find that pollution prevention programs are your most effective means of reducing environmental costs and risks. This second edition guide focuses on the environmental cost savings and risk reductions that can be realized through pollution prevention program implementation and demonstrates how such programs make good business sense.

Over the past few years, pollution prevention has evolved from a recommended environmental management approach into a central part of many laws, policies, and regulations. Federal laws such as NEPA, the Pollution Prevention Act, and the Federal Facilities Compliance Act effectively require you to incorporate pollution prevention as part of your decision making process. In addition to these acts, Executive Orders such as E.O. 12856, "Federal Compliance with Right to Know Laws and Pollution Prevention Requirements" and 29 state pollution prevention/source reduction laws also effectively mandate that pollution prevention be included in your acquisition decision making process. The Department of Defense (DoD) and the U.S. Army have also embraced pollution prevention and issued numerous directives, instructions, and regulations that specifically describe your program implementation requirements.

Fortunately, incorporating pollution prevention into your acquisition decision making process is not expensive or difficult. In fact, implementing an effective acquisition pollution prevention program will help you reduce your program life-cycle costs and mitigate environmental impacts. Throughout this second edition guide, examples of commercial firms (including military contractors) that have implemented pollution prevention programs and reduced life-cycle costs are presented. These commercial success stories are discussed relative to potential U.S. Army acquisition program applications. Whenever possible, the discussions address applicability of pollution prevention to U.S. Army acquisition programs within the context of decision making opportunities for you, the MATDEV.

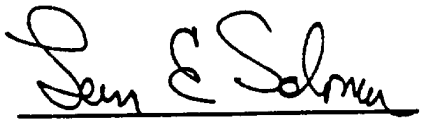
The "front of the pipe" nature of many pollution prevention decision making opportunities requires some system performance analysis in addition to economic analysis. This second edition guide provides a MATDEV-level overview of the process by which environmentally acceptable substitutes for hazardous materials are identified and incorporated in the acquisition program. The MATDEV-level performance analysis overview includes a summary of key issues you should address and provides the information you need to assemble and train a support staff that can effectively handle complex technical issues. These support personnel are your key to making effective decisions regarding performance, cost, and environmental impact trade-offs.

Throughout this second edition of the guide, you will encounter suggestions regarding how to make effective pollution prevention trade-off analyses and the need to tailor the decision making process to your program. The concepts of trade-offs and tailoring inherently reflect the fact that pollution prevention is a decision making process based on informed analysis, not a "ticket to be punched," or a report to be completed. Pollution prevention is a process that you have an opportunity to apply to every aspect of your acquisition program.

To assist you with the application of pollution prevention throughout the acquisition life cycle, this second edition guide includes updated and revised pollution prevention contractual documentation. The most important change between the contractual guidance presented in our first edition guide and this second edition is the use of National Aerospace Standard (NAS) 411, "Hazardous Materials Management Program," as a DoD contract tool. DoD and the Army have endorsed the use of NAS 411 as the primary means of including pollution prevention requirements in contract packages.

In addition to contractual issues, this second edition guide also includes the latest information about agencies that are available to assist you with pollution prevention/environmental issues. Agencies within DoD, the Federal Environmental Protection Agency (EPA), and even state environmental regulatory agencies are discussed. Whenever possible, the groups within the agencies that can effectively support your decision making process and those that are more appropriate to assist members of your support staff with more technical issues are identified.

This second edition guide is intended as a streamlined tool to provide you with key information regarding acquisition pollution prevention. We hope you find the document to be a useful and efficient resource. With your continued commitment, we can maintain our lead role in ensuring environmental stewardship and simultaneously make the most efficient possible use of our available program funds.



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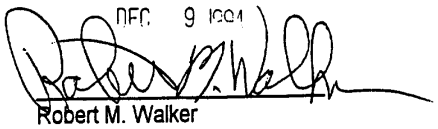

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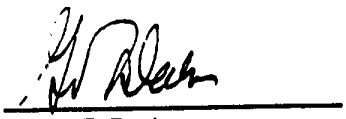

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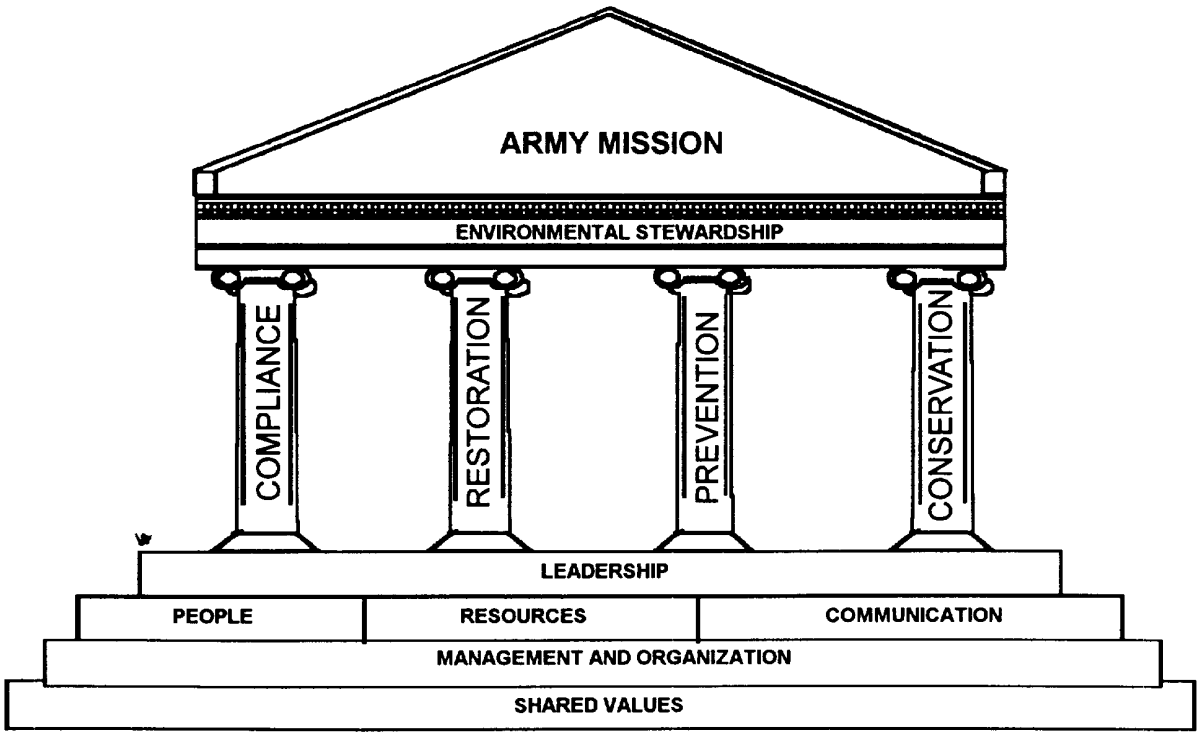
1 INTRODUCTION

The first edition "Materiel Developer's Guide for Pollution Prevention" was released in August 1992 and was intended to help you, the Materiel Developer, understand and implement acquisition pollution prevention. Over the past two years, the concept of pollution prevention has developed and evolved in many exciting, new ways. This second edition of the guide provides you with an even more useful reference source for information about pollution prevention concepts, associated requirements, and specific implementation guidelines. Although much of the second edition guide is new, we have retained important background information describing key acquisition pollution prevention concepts for use as reference materials.

ARMY ENVIRONMENTAL PROGRAM

Pollution prevention is a key component of the overall Army environmental program. The Army environmental program describes how environmental management strategies are incorporated into Army activities. The following graphical interpretation of the Army environmental program shows that POLLUTION PREVENTION is one of the four primary pillars that supports the Army goal of ENVIRONMENTAL STEWARDSHIP and the overall ARMY MISSION.



Each of the four pillars shown represent viable means of reducing the Army's impact on our natural resources. The primary differences between the four pillars relate to overall process economics, risk factors, and final system performance.

Table I shows how each of the environmental management approaches described in the Army environmental program affects life-cycle costs, risk factors, and potential product performance.

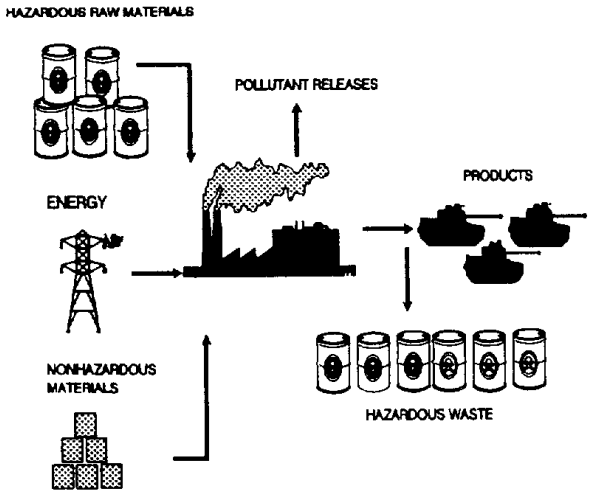
Table I
Army Environmental Program Pillars and Their Effect on Life-Cycle Cost, Risk, and System Performance

PILLAR	**EFFECT ON LIFE-CYCLE COST**	**EFFECT ON SCHEDULE**	**EFFECT ON SYSTEM PERFORMANCE**
POLLUTION PREVENTION	DECREASE · REDUCED PRODUCTION COSTS · REDUCED HAZARDOUS WASTE DISPOSAL COSTS	DECREASE · REDUCED AMOUNTS OF HAZARDOUS MATERIALS ENTERING PROCESS INHERENTLY REDUCE RISK	IMPROVED · NEW MATERIALS OR PROCESSES CAN OUT PERFORM ORIGINALS · FEWER HAZARDOUS MATERIALS/PROCESSES IMPROVE MAINTENANCE EFFICIENCY
CONSERVATION	SLIGHT DECREASE · REDUCED WASTE DISPOSAL COSTS · RECOVER VALUE OF RECYCLED MATERIALS	NO EFFECT	NO EFFECT
COMPLIANCE	INCREASE · PAY FOR POLLUTION CONTROL EQUIPMENT · PAY FOR RECURRENT MAINTENANCE AND UPGRADES	NO EFFECT OR INCREASE · PROCESS DISRUPTIONS TO INSTALL NEW EQUIPMENT · CONSTANT SYSTEM UPGRADES TO COMPLY WITH LATEST LAWS	NO EFFECT
RESTORATION	SIGNIFICANT INCREASE · RESTORATION PROJECT COSTS ARE VERY HIGH	SIGNIFICANT INCREASE · RESTORATION PROJECTS CAN BE LENGTHY · CREATING A SITE THAT NEEDS RESTORATION IS AGAINST THE LAW	NO EFFECT

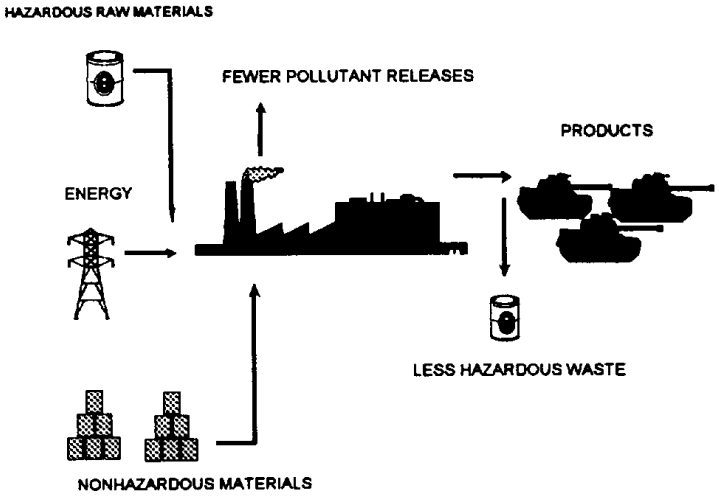
Table I shows that POLLUTION PREVENTION is the only environmental management approach that can reduce your program life-cycle costs, minimize schedule risks, and improve overall system performance. CONSERVATION-BASED environmental management approaches can decrease program costs, but really have no impact on either risk or performance factors. CONSERVATION programs simply reduce the environmental impact of existing equipment or systems. An environmental management strategy based on COMPLIANCE actually increases program life-cycle costs; can have no influence on, or actually increase, program schedule risk factors; and has no impact on system performance. The COMPLIANCE environmental management approach does not have a positive impact on program life-cycle costs or schedule risk factors because such programs do not affect the hazardous materials that flow into a production process. Because hazardous materials entering a production process inherently increase costs and risks, a COMPLIANCE approach can never completely alleviate the environmental problems. Because pollution problems can never be completely alleviated using a COMPLIANCE approach, such programs are inherently reactive and can be adversely affected by even subtle changes in environmental laws. RESTORATION programs focus on cleaning-up sites that were polluted in the past and are a viable means of improving our environment. However, current acquisition managers should not even consider handling hazardous materials in a manner that could create a site requiring restoration. Releasing hazardous material into the environment in a manner that could create a site requiring restoration is against the law and could result in civil/criminal penalties.

Table I shows that POLLUTION PREVENTION is the most effective environmental management strategy. As such, pollution prevention has become the Army's preferred environmental management approach and constitutes a broad national policy. The overall pollution prevention concept is related to source reduction. Source reduction involves reducing the amounts of hazardous materials entering a process to derive a corresponding decrease in the amounts of hazardous wastes emitted. Thus, pollution prevention programs are those that affect the "front of the pipe," not the "end of the pipe."

BEFORE POLLUTION PREVENTION



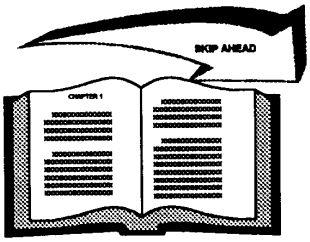
AFTER POLLUTION PREVENTION



As shown above, pollution prevention or source reduction programs reduce program hazardous waste discharges by reducing the amounts of hazardous materials entering the process. The purpose of this guide is to provide MATDEVs at all levels with important pollution prevention information that can be used during acquisition program management. How, and to what level, you implement pollution prevention programs is your management option. You are encouraged to tailor your pollution prevention program to address program issues in as much detail as you feel will be beneficial to the acquisition program.

Because some MATDEVs may have already implemented comprehensive pollution prevention programs, while others have just initiated their efforts, this guide includes a wide range of information. To be of as much use to the entire acquisition community as possible, we have structured the guide in discrete chapters covering key pollution prevention topics. The subject matter presented in these chapters ranges from basic information about the pollution prevention concept to specific details regarding program implementation as part of the acquisition process. You are encouraged to evaluate your own personal understanding of pollution prevention and your current pollution prevention program implementation level to determine what sections of this guide will be of most use to you. If you feel that a comprehensive pollution prevention review would be beneficial, you can read the entire guide from cover-to-cover. However, if you already have a well-established pollution prevention program and only want to learn about the latest implementation guidelines, you can skip ahead to Chapter 3.

Read What You Need



Because this guide is a tool for your use, skip to whatever sections you feel will be helpful. This guide is intended to help you implement an effective pollution prevention program and is not intended as a burdensome reading exercise.

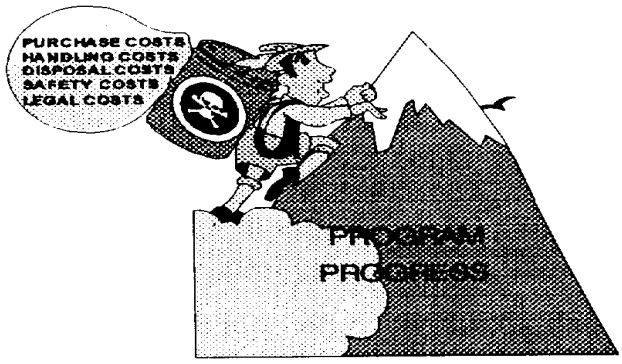
WHAT CAN A POLLUTION PREVENTION PROGRAM DO FOR ME?

Pollution prevention or source reduction programs can effectively reduce your program life-cycle costs, minimize schedule and other risk factors, and actually improve the performance or quality of your materiel. Put simply, pollution prevention is synonymous with good business practices in our increasingly environmentally conscious world. The purpose of this section is to demonstrate this equivalence. The discussion will include key concepts and descriptive examples showing how you can make decisions that effectively prevent pollution and improve overall acquisition program efficiency. However, the central purpose of this section is to show you how pollution prevention can improve your overall program.

Pollution Prevention Programs Reduce Life-Cycle Costs

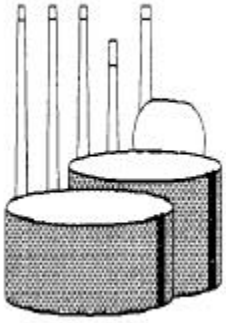
Pollution prevention programs offer you an effective means of reducing program life-cycle costs. Any hazardous materials included in your acquisition program inherently increase expenses and act as an economic burden on your ability to allocate resources.

Hazardous Materials are an Economic Burden



The most effective decision you can make to eliminate the economic drag created by hazardous materials is to implement a pollution prevention program. Pollution prevention programs replace the hazardous materials with less or non-hazardous alternatives that are inherently less expensive to purchase, handle, and treat for disposal. Economic impact estimates suggest that for every dollar spent directly on the purchase of hazardous materials, approximately $10 are spent handling the material in the production facility, treating the production process effluents, protecting the work force, litigating torts, and disposing of the final hazardous wastes.

The following example shows how decision-makers at Dow Chemical Corporation significantly reduced costs through pollution prevention program implementation.



Chemical*	
Pollution Prevention Project:	Replace water-based gas absorption with process that does not generate hazardous waste.
Schedule Risk:	Moderate to implement new process.
Dow Chemical*	
Savings:	Save $2.4 million/year (1.2 month payback)
Performance Risk:	Moderate (technical data showed process equivalence).
Company: Dow	

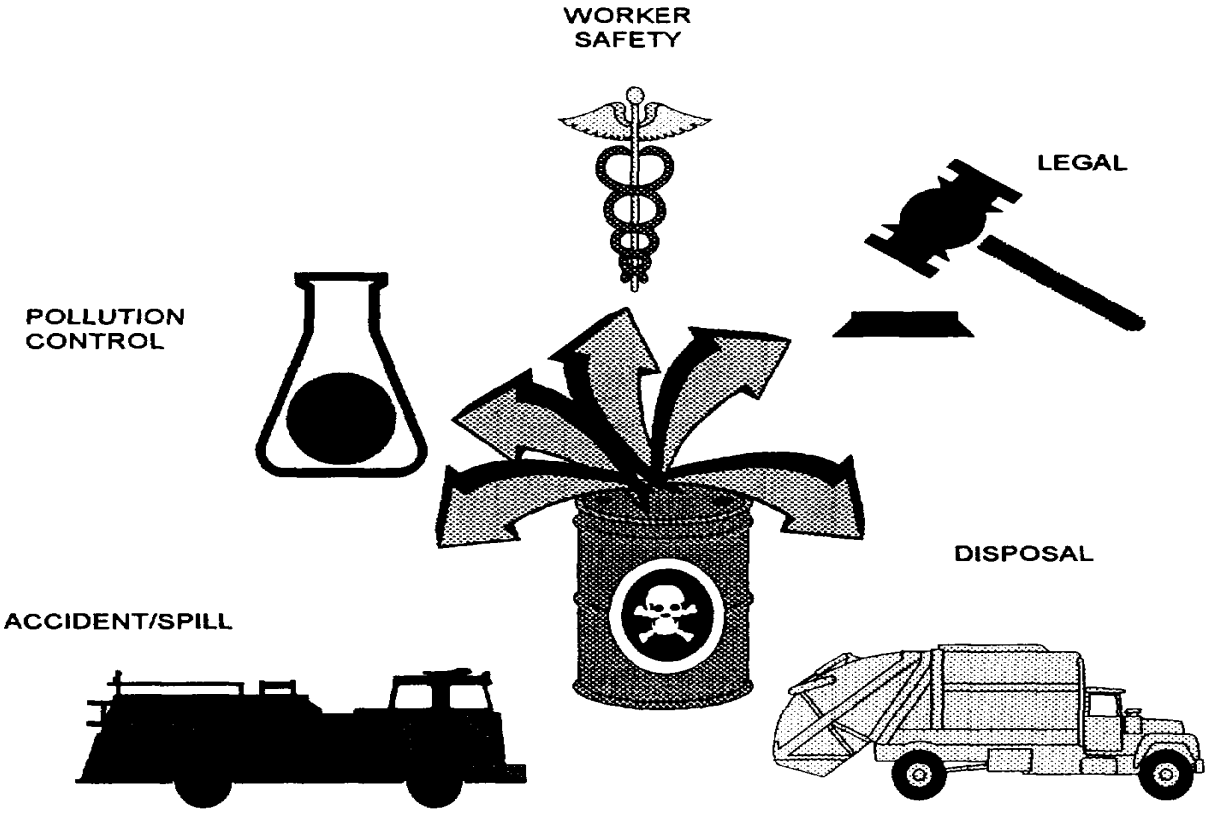
The program savings described above are derived directly from a prototypical pollution prevention or source reduction program. Dow Chemical Corporation decision-makers implemented an alternative chemical manufacturing technology that produced comparable products using fewer hazardous materials and producing fewer hazardous wastes. Not only did the alternative chemical manufacturing technology produce a product that could satisfy customer performance requirements, but the new production process used fewer hazardous materials and inherently reduced environmental compliance/worker health risks. The cost savings realized by Dow Chemical are significant because the company produces large volumes of products. Although you may not be doing business with Dow Chemical, other Army contractors may be employing similar pollution prevention methodologies. If you are managing an Army acquisition program that requires large volumes of chemicals, your program could realize similar significant savings from effective pollution prevention program implementation.

Pollution Prevention Programs Reduce Schedule Risk

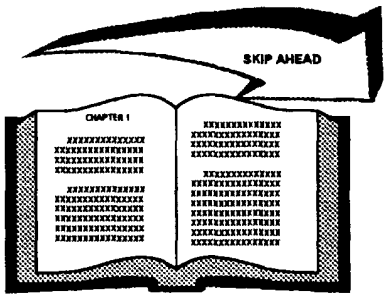
The use of any hazardous materials in your acquisition program creates risks. Many of the risks related to hazardous materials can adversely impact your program schedule because of permit requirements, approvals, and/or other regulatory interactions. In some cases, these risks can affect you personally. Every hazardous material included in your acquisition program is analogous to a "Pandora's Box" of risks.

*Case study from the article titled, "Contrasting Approaches to Pollution Prevention Auditing," published in the Summer 1991 issue of Pollution Prevention Review.

Purchasing a Hazardous Material Opens a Pandora's Box of Compliance Risks



As shown above, all hazardous materials create risks related to accidents or spills, permit compliance, worker health and safety, legal interactions (e.g., injunctions or Notices of Violation (NOVs)), and hazardous waste disposal compliance risks. These risks can increase your program costs, cause schedule delays (including as a worst-case scenario, stopping the program), disrupt program progress, and in another worst-case scenario result in civil or criminal charges being filed against you as the cognizant manager. The magnitude of these various risks are defined by myriad Federal, state, and local laws; DoD and Army regulations; Executive Branch policies; and international treaties. If you would like to review key laws, regulations, and policies in more detail, you can skip ahead to the "What are My Legal and Programmatic Pollution Prevention Requirements" discussion in Chapter 2.



The most effective decisions you can make to reduce your program and personal risks are related to pollution prevention and source reduction. By implementing effective pollution prevention programs you can eliminate the hazards, reduce the hazards, or identify replacements for hazardous materials and thus completely avoid opening the "Pandora's Box" of risks.

The following is a case study from an Army contractor that shows how effective pollution prevention implementation reduces program risk factors.

Company:	General Dynamics, Land Systems Division*
Pollution Prevention Project:	Replace solvent-based weld inspection with non-hazardous magnetic particle system.
Savings:	Save $245/vehicle (2.4 month pay back).
Schedule Risk:	Minimal.
Performance Risk:	Moderate (technical data showed process equivalence).

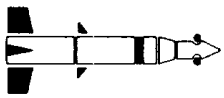
The General Dynamics, Land Systems Division (GDLS), program shows how a contractor, working directly for an Army MATDEV, successfully reduced program schedule, worker health, and disposal risk factors by effectively implementing a pollution prevention program. In addition to reducing schedule risk, this pollution prevention program simultaneously reduced operating costs while having no affect on overall system performance. During the 1980s, GDLS had been using a solvent-based penetrant dye to inspect welds. The inspection process used over 50,000 pounds of 1,1,1-trichloroethane (TCA) in 1990. By replacing the penetrant-dye process with a dry magnetic particle weld inspection technique that uses no TCA and generates little hazardous waste, facility TCA consumption fell to 7,000 pounds in 1992. Reducing TCA consumption before the 1995 production phase-out for this material minimized the GDLS schedule risk (i.e., GDLS managers avoided a mad scramble to find an alternative weld inspection technique after the TCA was phased-out of production), minimized the worker health risk created by the volatile solvent, and reduced facility waste handling/disposal costs. In fact, the pollution prevention program cost savings are approximately $245/vehicle. In addition, GDLS found that the pay-back time for the new inspection equipment was only 2.4 months. Finally, because the weld inspection techniques were nearly equivalent in sensitivity and accuracy, overall product performance was not affected.

*Case study from the article titled, "Results of Pollution Prevention Reviews 1993 Survey: Industry's Pollution Prevention Practices," published in the Autumn 1993 edition of Pollution Prevention Review.

Pollution Prevention Programs Can Improve Materiel/System Performance

Carefully conceived pollution prevention programs can actually result in materiel that has better overall performance or quality than the materiel manufactured using hazardous-material-based processes. Examples of technologies that have already been used by MATDEVs in the Army, Navy, and Air Force to prevent pollution while simultaneously improving quality are described in Table II.

Table II
Pollution Prevention Programs that Improved Product Performance

APPLICATION	HAZARDOUS PROCESS	ALTERNATIVES THAT PREVENT POLLUTION	PERFORMANCE IMPROVEMENT
 AUTOMOTIVE INDUSTRY PRIMER	• SPRAY PRIMER •• CONTAINS VOCs •• ENVIRONMENTAL AND WORKER HEALTH RISK	• ELECTRODEPOSITED EPOXY PRIMER •• VIRTUALLY NO PROCESS SOLVENTS OR WASTE EMISSIONS	• SUPERIOR CORROSION CONTROL PERFORMANCE • SUPERIOR THICKNESS CONTROL
 AIRCRAFT CORROSION-CONTROL COATINGS	• CADMIUM PLATING •• HAZARDOUS HEAVY-METAL BASED PLATING •• WORKER HEALTH HAZARD	• ION VAPOR DEPOSITED ALUMINUM •• ZERO-DISCHARGE METAL COATING PROCESS	• SUPERIOR CORROSION CONTROL PERFORM-ANCE AT ELEVATED TEMPERATURES • LIGHTER WEIGHT COATING
 BEARING SURFACE HARDENING	• CHROME PLATING •• HAZARDOUS HEAVY-METAL PLATING •• WORKER HEALTH HAZARD	• ION IMPLANTATION •• ZERO-DISCHARGE SURFACE MODIFICATION PROCESS	• SUPERIOR WEAR RESISTANCE • NO DIMENSIONAL CHANGE

The examples shown in Table II reflect technologies that were developed in the commercial sector and have been adopted by the military to replace hazardous-material-based processes. The decision-making opportunities presented by these new technologies typically require major changes in acquisition program requirements. Typically these processes require new equipment, training, and procedures. Consequently, the decision to proceed with implementing any of these types of technologies can require a significant amount of background research. However, if you make these significant decisions effectively, you can derive a pay-off in reduced lifecycle costs, decreased program risks, and improved performance. Guidance regarding how to make pollution prevention decisions effectively is provided throughout Chapter 3, "How Do I Develop and Manage a Pollution Prevention Program?"

In addition to the type of major process modifications discussed in Table II, there are many other decisions that you can make over the course of an acquisition program that do not require such significant changes in the manufacturing process, will have a positive impact on overall performance, and can still prevent pollution. These pollution prevention decision-making opportunities typically relate to replacing or eliminating superfluous hazardous materials, or simply using irreplaceable hazardous materials more efficiently. The following example shows how a relatively simple decision to use materials more efficiently resulted in major savings for an Air Force contractor and still allowed production of the highest quality materiel possible.

Company:	Northrop Aircraft Division*
Pollution Prevention Project:	Purchase paints in containers that are sized to complete specific jobs.
Savings:	Save $400,000/year.
Schedule Risk:	Minimal
Performance Risk:	None, no new materials.

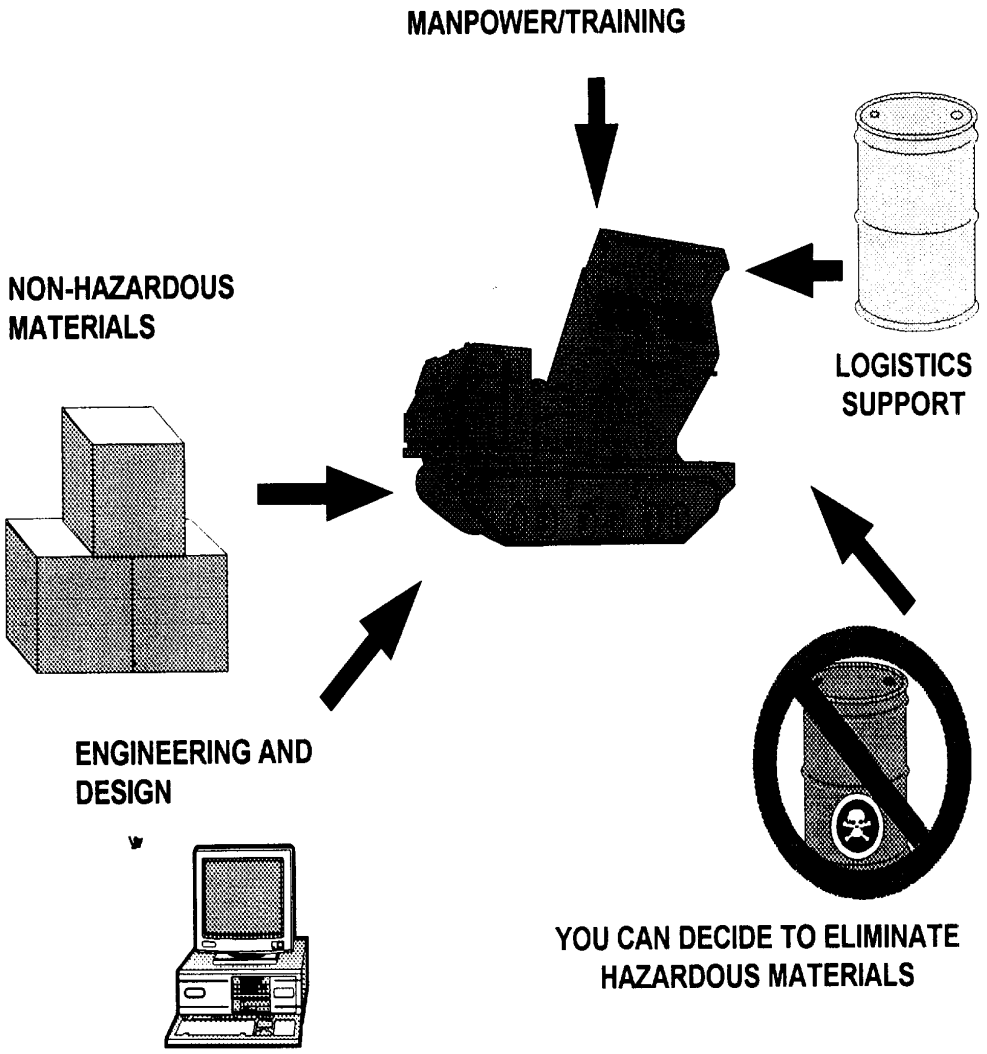
The Northrop Aircraft Company engineering staff had to use certain hazardous materials to ensure effective performance of the B-2 bomber. The engineering staff was tasked to investigate means of reducing the overall environmental impact of the required hazardous materials. The engineering staff found that most of the problems created by the hazardous paint/sealants used in the B-2 related to waste material and not to in-process handling or treatment. Northrop found that two-component coatings and sealants (i.e. two component materials that are mixed before use and will harden in a few hours) were historically procured in large containers that held far more material than was actually applied to aircraft during a shift. At the end of the shift, the unused, but fully cured, paints/sealants had to be disposed of as a waste. Based on these findings, Northrop decision-makers elected to simply change their procurement policy to acquire materials in containers that were optimally sized to be completely consumed during one shift. By simply purchasing materials in optimally-sized containers, Northrop reduced paint/sealant purchase costs and saved money through reduced waste disposal costs. Furthermore, Northrop reduced risks associated with environmental compliance by reducing the volume of their waste stream. Because only materials that satisfied operational requirements were procured, overall system performance was unaffected.

* Case study from the article titled "A Regular Industry Partnership - How California Reduced In Hazardous Waste," published in the Spring 1994 edition of Pollution Prevention Review.

POLLUTION PREVENTION DECISION-MAKING OPPORTUNITIES

The discussion presented in this chapter shows that pollution prevention programs can reduce program life-cycle costs, minimize risk factors, and improve product quality. These benefits are derived by avoiding the use of hazardous materials in systems. If you decide to implement an acquisition pollution prevention program, you will have opportunities to make decisions regarding the elimination of hazardous materials. By selecting only those pollution prevention program opportunities that will improve, or at least not degrade, overall system performance, you will minimize cost/risk factors and still ensure that we continue to produce the highest quality materiel in the world.

Pollution Prevention is a Decision-Making Process



2 WHAT ARE MY LEGAL AND PROGRAMMATIC POLLUTION PREVENTION REQUIREMENTS?

Pollution prevention has become a key part of Federal, state, and local laws over the past few years. In addition to these laws, there are many policy statements, Army regulations, and international treaties that either directly require pollution prevention or indirectly mandate reductions in the use of hazardous materials. Compliance with these laws, policies, and regulations is part of your program management responsibility. In many cases, pollution prevention programs represent the most cost effective and efficient means available of satisfying all of your statutory environmental requirements. The purpose of this chapter is to provide you with the key information necessary to manage pollution prevention programs in a manner that will comply with all pertinent laws, regulations, and policies. Because you are the program management authority, there are a number of key environmental/pollution prevention laws, policies, and regulations that you must address. The following is a quick reading list of these key laws, policies, and regulations.

MATERIEL DEVELOPER'S REQUIRED READING LIST

By reading the key laws, policies, and regulations listed above you will have a basic understanding of your requirements. However, this basic understanding is just a start; you or your support staff should fully

The following discussion is subdivided into sections dealing with Federal and state laws, policies, DoD/Army regulations, and international treaties. Each section summarizes requirements as they relate to Army

risk. In addition, a quick summary of how pollution prevention can reduce your risk factors is also presented.

FEDERAL REGULATIONS

level. Statutory requirements may be directly related to pollution prevention or may relate to other environmental issues that could best be addressed through a pollution prevention program. To add an additional

that individual states must achieve through their own environmental laws. Provided these Federally mandated minimum requirements are achieved, states are free to set laws that are more restrictive than those at the Federal

following discussion section provides you with a brief summary of each Federal law that could significantly impact your program. In addition, brief explanations are provided that show how pollution prevention could

starting point.

National Environmental Policy Act (NEPA)

NEPA was passed in 1969 and is considered the "grandfather" of all domestic environmental laws. NEPA requires the environmental consequences of major actions to be considered and encourages public

Risk: NEPA established the requirements for all commercial

environmental decision-making process; to consider the environmental impacts of the proposed actions; and to

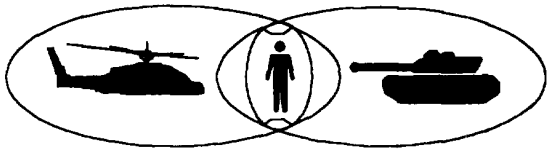
decision. NEPA always requires environmental analysis and may require Environmental Assessments (EAs).

and Environmental Impact Statements (EISs) to be prepared for any major Federal action. NEPA analysis requirements not only directly affect Federal actions, but have also been incorporated into many state permitting requirements. NEPA does not include specific enforcement provisions. However, if NEPA requirements are ignored, a judge can issue an injunction against the proposed action pending completion of the required environmental analysis, EA, or ElS.

How Pollution Prevention Can Reduce Risk: NEPA requires environmental analysis. Pollution prevention is a key subset of the environmental analysis that contributes to the overall decision-making process. Any pollution prevention program efforts to reduce hazardous materials use will inherently reduce the complexity of the environmental analysis. Thus, pollution prevention programs become an integral part of the NEPA environmental analyses and help reduce overall environmental risks.

Occupational Safety and Health Act (OSHA)

Background: OSHA created the Occupational Safety and Health Administration in 1970. OSHA is intended to ensure safe and healthy conditions in the workplace.



Risk: OSHA regulates workplace safety and sets worker health standards. The Director of Army Safety is the principal advisor to the Army for OSHA compliance. The Army Surgeon General provides technical input and oversight for the occupational health issues involved in OSHA compliance. Although OSHA cannot enforce safety regulations in strictly military settings, violation notices and fines can be issued to Army contractors.

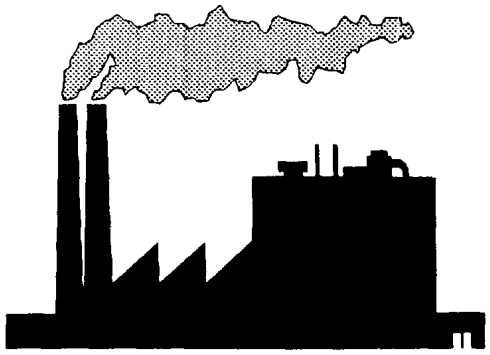
In some instances, OSHA can pursue criminal charges against individuals.

How Pollution Prevention Can Reduce Risk: Pollution prevention programs that eliminate hazardous materials from production processes and the workplace inherently reduce the risk of OSHA enforcement.

Clean Air Act (CAA)

Background: The CAA was first passed in 1970, significantly amended in 1977, and amended again in 1990. This legislation is designed to prevent, control, and abate air pollution in the United States.

Risk: The CAA and its amendments create compliance risk for any Army activity that creates airborne pollutants. These pollutants include powerplant/vehicle exhaust, volatile organic



compounds released from painting processes, and even the fumes/mists released from metal plating operations. The regulations developed from the 1990 CAA Amendments may allow additional taxes or fees for "hazardous air pollutants" (HAPs) emissions. The HAPs list includes many paint solvents used in Army coatings and may impact the fumes/mists emitted from plating operations. CAA regulations are enforced using state and local agency permits. Permit provisions vary considerably across the United States and are generally considered the most restrictive in California's South Coast and Bay Area, Air Quality Management Districts. Failure to comply with air emission permit requirements can lead to notices of violations, $250,000/day fines or, in worst-case scenarios, five-year prison terms for individuals.

How Pollution Prevention Can Reduce Risk: Pollution prevention programs that include the replacement of materials or processes that emit air pollutants with nonpolluting alternatives will significantly decrease CAA compliance risk.

Clean Water Act (CWA)

Background: The CWA was first passed in 1972, was amended in 1987, and is currently being reauthorized. This legislation is intended to control and abate water pollution throughout the United States.

Risk: The CWA compliance risk is similar to that for the CAA. State and local agencies issue the aqueous pollutant emission permits that form the basis for enforcement provisions. Proposed provisions of the reauthorized CWA will include taxes based on the discharge of specific hazardous chemical pollutants into the environment. Taxes/fees will be higher for facilities emitting more hazardous pollutants such as heavy metals from plating shops than those emitting ordinary sewage or other less-hazardous wastewater. Violations of state/local water quality permits can lead to notices of violations, fines of $50,000/day, and in worst-case scenarios, two-year prison terms.

How Pollution Prevention Programs Can Reduce Risk: Pollution prevention programs that replace materials or processes that emit aqueous pollutants with less hazardous alternatives will significantly decrease CWA compliance risk.

Resource Conservation and Recovery Act (RCRA)

Background: RCRA was first passed in 1976 and amended in 1984. This legislation is intended to ensure the safe, environmentally acceptable handling of hazardous wastes.

RCRA establishes guidelines and standards for hazardous waste handling, transportation, treatment, storage, and disposal. RCRA even includes some pollution prevention-type provisions. RCRA is an enormous

6002, Federal agencies in their procurement activities are required to eliminate from their specifications any exclusion of recovered materials or requirements for virgin materials. Federal agencies must require the use of

compliance violations can lead to notices of violation and a maximum punishment of a $1,000,000 fine.

How Pollution Prevention Can Reduce Risk: Pollution prevention programs that
hazardous materials (i.e., concurrently reducing the generation of hazardous wastes) will reduce RCRA compliance risks.

Background: The FFCA was passed in 1992 and

Federal facilities that was originally described in the Resource Conservation and Recovery Act.

The FFCA allows the Federal
Environmental Protection Agency (EPA) or the individual states to file civil charges against Federal agencies.

private industry since the early 1970's. The enforcement provisions for the FFCA vary with the individual laws being enforced and with specific state regulations.

allowing Federal
agencies and personnel to be subject to the same Federal and state environmental laws that affect private

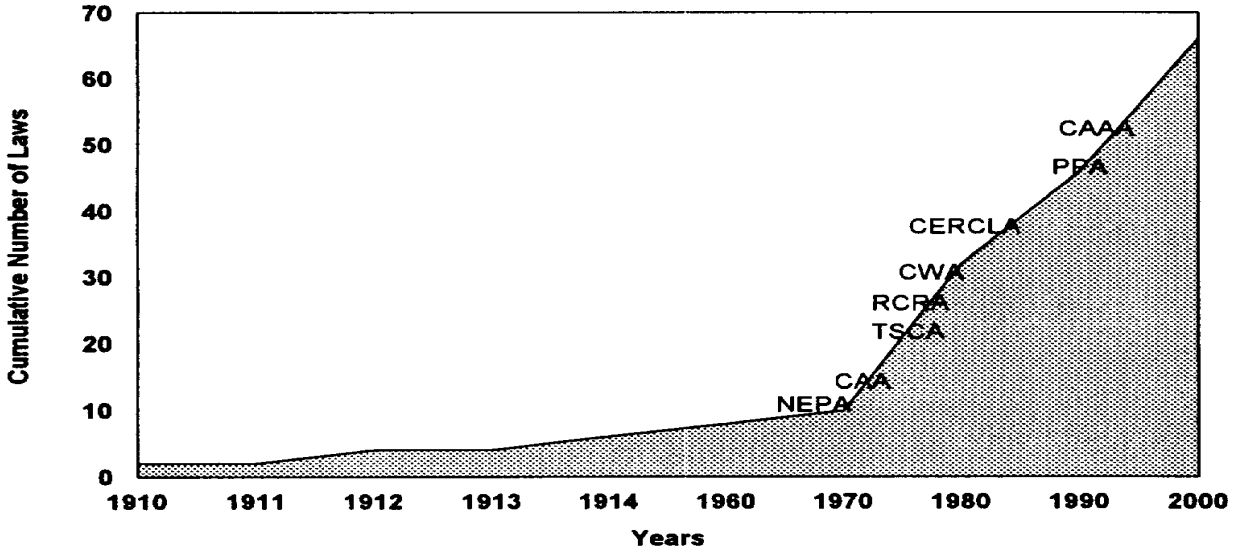
Federal and state environmental law. Pollution prevention is an effective means of reducing risk factors related to virtually all environmental laws.

impact on an acquisition program. There are many other Federal environmental laws that could impact specific aspects of individual acquisition programs. The total number of Federal environmental laws today includes over

of Federal environmental regulations and amendments since 1900. The figure shows the cumulative number of environmental laws along the vertical axis,

and time along the horizontal axis. The acronym labels along the curve correspond to the specific laws. For example, CAA is the Clean Air Act, and CAAA is the Clean Air Act Amendments of 1990.

Cumulative Number of Federal Environmental Laws



Source: Assistant Secretary of the Army (Installations, Logistics & Environment).

The trend shown above demonstrates that environmental regulations are currently, and will continue to be, a major factor affecting your acquisition program. Pollution prevention programs are the most effective means you can use to minimize the compliance risks associated with the ever-increasing body of Federal environmental legislation.

EXAMPLES OF STATE AND LOCAL ENVIRONMENTAL REGULATIONS

Although compliance with Federal environmental regulations may seem complex, compliance with state regulations can seem overwhelming if you are trying to administer an acquisition program that involves activities occurring across the country. Many state and local governments have enacted legislation and ordinances that are more restrictive than those at the Federal level. To add an additional degree of complexity, many states are subdivided into local or regional regulatory bodies. In this brief discussion, we cannot summarize all of the individual state and local regulatory requirements for air, water, and solid pollutants. However, we can provide you with a brief summary of specific state pollution prevention requirements. From your management perspective, state pollution prevention laws can create far more risk than the Federal Pollution Prevention Act (PPA) because unlike the PPA that has no enforcement provisions, some state laws include provisions for making pollution prevention planning part of the mandatory facility permitting process. The following are

examples of enforcement provisions associated with selected state pollution prevention laws:

State: New Jersey

Law: Toxic pollution Prevention Act (TPPA)

Enforcement Provisions: The TPPA requires industrial facilities to prepare pollution prevention plans. These plans are mandatory and are considered similar to permits. Failure to produce an adequate plan can cause schedule delays and injunctions.

State: Arizona

Law: Hazardous Waste Management Statues (1991 Amendments)

Enforcement Provisions: The Arizona laws require large quantity generators to develop and submit pollution prevention plans. The plans are focused on chemicals reported under the toxic release inventory program. These plans must be updated yearly and a fee is associated with large quantity generators' use of off-site disposal practices. Failure to produce such a plan can result in permitting delays.

In addition to the specific examples of state laws listed above, a total of 29 states currently have laws requiring pollution prevention and/or source reduction. To provide you with the most useful data regarding state pollution prevention laws and requirements, **Appendices A and B include tables listing the state regulations, their specific requirements/enforcement provisions, and state agencies that can explain the individual laws**. The tables allow you to quickly reference information about the states in which your acquisition program has major industrial facilities.

Given the number of Federal and state laws discussed, you may be feeling a bit overwhelmed with requirements. However, there are still executive orders, policies and regulations to be discussed. Again, to provide you with the most *data* in the most useful format, only those Executive Orders, policies, and regulations that will have the greatest impact on your programs are included in this discussion.

EXECUTIVE ORDERS

Executive orders signed by the President have recently created specific pollution prevention requirements that will have far reaching impacts on acquisition

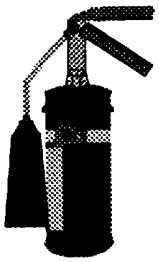
programs. The following sections summarize the Executive Orders and their potential impact on Army acquisition programs.

Executive Order: 12856 "Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements"

Acquisition Program Impact: Executive Order 12856 requires acquisition program managers to implement pollution prevention programs at government and contractor facilities. The Army as a whole is required to reduce its release of toxic chemicals (as defined in section 2-206 of the Executive Order) by 50% by 1999 from a 1994 baseline. In addition to the impact on the Army as a whole, E.O. 12856 also includes provisions for eliminating hazardous materials from standardized documentation packages (including military specifications). These changes in documents may affect the development of acquisition program technical data packages.

Executive Order: 12843 "Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances"

Acquisition Program Impact: Executive Order 12843 states that it is an executive branch policy to minimize the procurements of materials and substances that contribute to stratospheric ozone depletion (e.g., refrigerants and fire suppressants). It also gives preference to the procurement of chemicals, products, and manufacturing processes that reduce overall risks to health and to the environment. The policy requires amending existing and new contracts so that ozone-depleting chemical phaseout schedules are considered. In response to E.O. 12843, DoD developed a protocol for addressing ozone-depleting chemical uses. In accordance with DoD policy any effort to include an ozone-depleting compound in a procurement contract, must be approved by Senior Approving Officials (typically Senior Executive Service level). Obtaining such approvals could delay the acquisition program schedule.



Executive Order: 12873 "Federal Acquisition, Recycling, and Waste

Acquisition Program Impact: Executive Order 12873 mandates that the Federal Government make more efficient use of natural resources by maximizing recycling and preventing waste generation wherever possible. This act specifically requires all government-owned, contractor-operated (GOCO) facilities to include recycling provisions in all contracts awarded after 20 October 1993. Furthermore, managers must consider eliminating requirements for the use of virgin materials, conduct life-cycle costs analyses of recycled materials, and implement source reduction planning.

Executive Order: 11738 "Providing for Administration of the Clean Air Act and the Federal Water Pollutant Act with respect to Federal Contracts, Grants, or Laws"

Acquisition Program Impact: Executive Order 11738 states that it is national policy for Federal agencies through their contracts for the procurement of goods, materials, or services to promote the effective implementation of the Clean Air and Clean Water Acts.

Executive Order: 12114 "Environmental Effects Abroad of Major Federal Actions"

Acquisition Program Impact: Executive Order 12114 mandates a NEPA-type review of the environmental effects of U.S. actions outside the U.S., its territories, and possessions. This policy will affect the development and planning of overseas combat readiness and training activities. As mentioned in the NEPA discussion, NEPA-type considerations inherently promote pollution prevention.

DoD DIRECTIVES AND POLICIES

The DoD Directives and Policies provide general policy-level guidance regarding your acquisition pollution prevention responsibilities. These requirements reflect the Federal/State laws and Executive Order requirements presented thus far.

DoD Directive: 4210.15 "Hazardous Materials Pollution Prevention"

Acquisition Program Impact:

DoDD 4210.15 requires DoD to become the Federal leader in environmental compliance and protection. This directive requires pollution prevention and compliance with all pertinent environmental and worker health regulations to" avoid harm to human health and the environment."

DoD Instruction: 5000.2 "Defense Acquisition Management Policies and Procedures"

Acquisition Program Impact:

DoD 5000.2 gives the program manager a broad defense acquisition management framework (see Part 6, Section I, "System Safety, Health Hazard, and Environmental Support"). It emphasizes reducing the use of hazardous materials in processes and in products. It also requires that the environmental consequences of a system be analyzed and documented at each decision phase of the system developmental process. This analysis requires a systematic examination of the environmental consequences of a program along with proposals to mitigate significant adverse impacts. Life-cycle cost accounting is described as a key program management tool.

DoD Manual: 5000.2-M "Defense Acquisition Management Documentation and Reports"

Acquisition Program Impact:

DoD Manual 5000.2-M includes all of the requirements for overall program management and environmental documentation. Environmental requirements are included in Annex E of the Integrated Program Summary. Chapter 3 of this guide, "How Do I Develop and Manage an Acquisition Pollution Prevention Program?" summarizes how pollution prevention is related to DoD Manual 5000.2-M requirements.

DoD Directive: 6050.1 "Environmental Effects in the United States of DoD Actions"

Acquisition Program Impact: This directive defines policy and requires DoD to assess environmental consequences of proposed actions that could affect the quality of the environment in the United States. DoDD 6050.1 requires DoD managers to comply with NEPA requirements. The overall directive objective is to achieve the widest range of beneficial uses of the environment without degradation, minimize risks to health and safety, or otherwise avoid unintended environmental consequences.

DoD Directive: 6050.9 "Chlorofluorocarbons (CFCs) and Halons"

.Acquisition Program Impact: This directive stresses the need to prevent and eliminate uses for CFC and Halon materials. DoDD 6050.9 states that it is DoD policy to effectively manage the use of such materials when no substitutes are available. All CFCs, Halons and all other ozone-depleting chemicals (ODCs) are included in this directive.

DoD Policy Memorandum: Memo from the Deputy Under Secretary of Defense (Environmental Security) issued on 4 January 1994, Subject: Review of the Draft Report to Congress on the Ozone-Depleting Substances Reserve.

Acquisition Program Impact: This memorandum defines the pollution prevention criteria that must be addressed before ODC-type solvents can be maintained in an Army reserve. The following five points summarize the requirements:

1. Submit a complete description of the existing ODC solvent recovery program.
2. Develop phase-out plan with specific milestones for replacing the solvent.
3 Document history of all alternatives tested for each application proposed and for each solvent to be included in the reserve.
4. Propose an R&D program for determining ODC substitutes, including funding committed and proposed.
5. Summarize similar ODC solvent applications and replacements used by industry.

DoD Policy Memorandum: Memo from the Deputy Under Secretary of Defense (Environmental Security) issued 13 April 1994, Subject: Phase-out of Class I Ozone-Depleting Substances.

Acquisition Program Impact: This policy memorandum directs the Defense Logistics Agency (DLA) to manage the DoD ODC reserve. All ODCs that are not required to service an existing weapon system should be placed in the DLA reserve.

ARMY REGULATIONS

Numerous Army Regulations and Draft Regulations also discuss pollution prevention. These regulations tend to provide you with specific implementation guidelines relative to the already discussed laws and policies. The following are brief summaries of key Army Regulations.

Army Regulation: AR 70-1 "System Acquisition Policy"

Acquisition Program Impact: This regulation defines specific pollution prevention guidance for Army acquisition programs. The regulation stresses the importance of addressing pollution prevention early and continuously throughout an Army acquisition program. The need to address the environmental effects of the production, operations, and maintenance of materiel are also emphasized.

Army Regulation: AR 200-1 "Environmental Protection and Enhancement"

Acquisition Program Impact: This regulation describes Army environmental responsibility areas including pollution prevention. The need to minimize waste generation throughout the life cycle, without significantly degrading mission effectiveness, is stressed. Techniques to reduce pollution generation such as modifications to the Depot Maintenance Work Requirements (DMWRs) and the use of alternative materials are also discussed.

Army Regulation: AR 200-2 "Environmental Effects of Army Actions"

Acquisition Program Impact:

This regulation defines objectives associated with the Council on Environmental Quality's NEPA regulations. One goal of AR 200-2 is to integrate environmental reviews concurrently with other Army decision-making actions to avoid program delays and to accomplish the mission efficiently. Army Regulation 200-2 also provides information clarifying how to develop and implement tiered Environmental Assessments (EAs) and Environmental Impact Statements (EISs) for specific life-cycle phases such as testing, production, development, usage, and ultimately disposal.

INTERNATIONAL TREATIES

Compliance with international treaty requirements also constitutes a portion of your acquisition pollution prevention responsibilities. The Montreal Protocol exemplifies the type of international treaty that could impact your acquisition program. The Montreal Protocol was ratified by the United States Congress in 1987 and amended in 1990 and 1992. This international treaty is intended to eliminate world production of CFCs and Halons (known collectively as Ozone-Depleting Chemicals (ODCs)). ODCs have been shown to adversely impact the earth's protective ozone layer. In November 1992, the Copenhagen Amendments accelerated the production phase-out of CFCs to 1 January 1996 and the production phase-out of Halons to 1 January 1994.

In February 1989, DoD adopted the Montreal Protocol guidelines in DoD Directive 6050.9, "Chlorofluorocarbons (CFCs) and Halons." The directive describes a policy based on minimizing ODC consumption whenever technologically possible. In addition to the DoD directive the 1993 Defense Authorization Act directed the military to reduce its use of ODCs. The effort necessary to adhere to these policies will include the modification or revision of 9,500 military specifications and thousands of individual contracts. The military must eliminate or find substitutes for the 13,000 metric tons of CFCs and Halons procured in 1990. Because many of these materials are used in demanding, critical applications, such as crew-space explosion suppression, the Army established an ODC Elimination Program. This program is designed to prevent operational problems and requires management of ODCs. The following five points summarize the requirements that could affect your program:

1. Review contracting actions to ensure that no ODC requirements are included where alternatives currently exist, and provide quarterly reports to Congress.

2. For new systems where no alternative exist, obtain through AAPPSO Army Acquisition Executive approval to use the ODC.

3. Where an immediate replacement is not readily available, initiate research and evaluation efforts for alternate technology and retrofit methodologies.

4. Store the recovered or replaced CFCs/Halon at the Defense Reserve for approved, critical weapon systems applications.

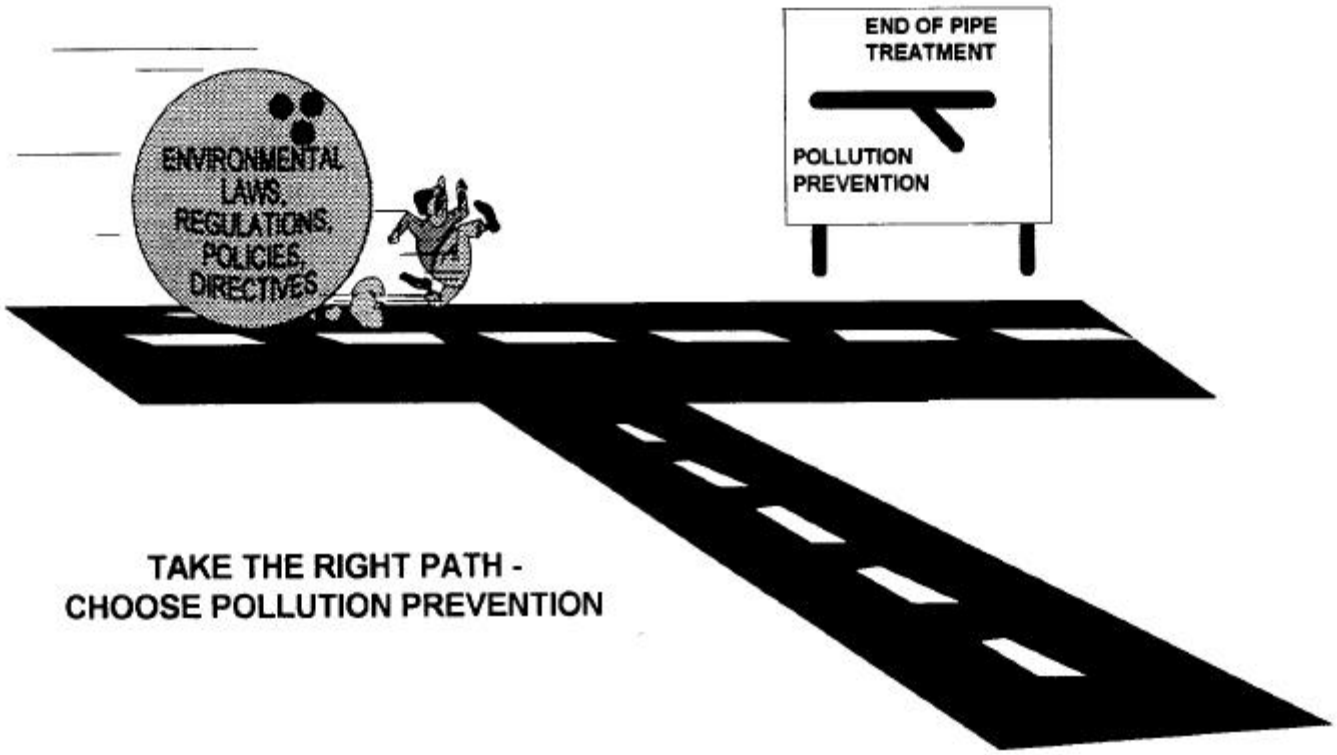
5. Budget and program appropriate resources to perform these efforts.

The accelerated domestic CFC elimination schedule will have an impact on the acquisition of current and future Army equipment. Because most current CFC/Halon substitute agents require system design alterations and/or modification to operating and maintenance procedures, the United States' efforts to comply with the Montreal Protocol could impact your acquisition program. You may have to redesign your system, reevaluate operations, or reevaluate maintenance procedures. This will result in the modification of the industrial facilities in which your system is maintained and overhauled because **the CFC/Halon materials you specify may simply be unavailable in less than two years.** Eliminating these materials from acquisition activities is a schedule-critical item that could put your programs at risk.

WHAT DO ALL THESE LAWS, REGULATIONS, AND POLICIES MEAN TO ME?

As a MATDEV, you are not expected to know every detail of every law or policy that could affect your program. However, as a manager, you hold the ultimate responsibility for environmental compliance and pollution prevention. Failure to adequately address environmental compliance and pollution prevention can delay your program, adversely affect your career; and, in a worst-case scenario, land you in jail.

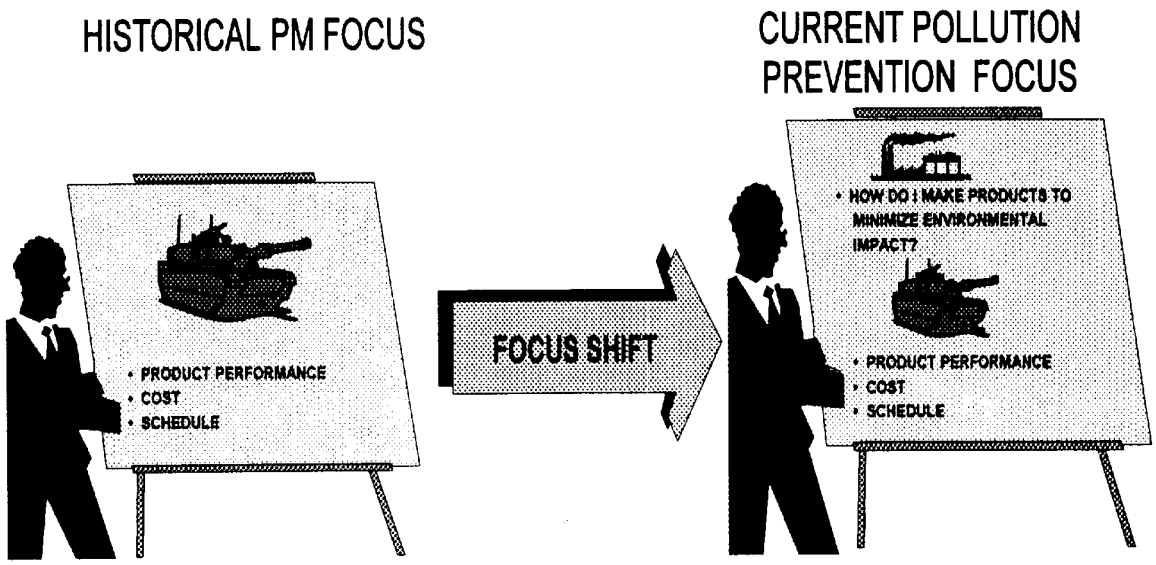
Obviously, not every facility Notice of Violation or other minor environmental infraction will lead to imprisonment. However, even minor environmental regulatory enforcement can cause program delays and increase personal risks. You, as the program manager, must be aware of these laws and regulations in order to "ask the right questions." As we have shown throughout this discussion of laws, regulations, and policies, pollution prevention is the best method you can use to permanently reduce your compliance risk factors. You can avoid a lot of environmental compliance problems by changing your path and adopting pollution prevention as your preferred management approach.



3 HOW DO I DEVELOP AND MANAGE A POLLUTION PREVENTION PROGRAM?

When the first edition of this guide was released in 1992, acquisition pollution prevention was a new concept. Today, pollution prevention has become a fundamental national policy. The Army has embraced this concept and shifted the preferred environmental management focus from waste treatment to acquisition pollution prevention.

POLLUTION PREVENTION SHIFTS YOUR FOCUS



By changing the environmental management focus from treatment of the production effluents to prevention of pollution through design/process modifications, your environmental management role has become more significant. Historically, when the environmental management focus was on treating the effluents from the production process, you did not have to weigh the environmental consequences of various system design options. You could rely on matrix support from facility engineers to treat whatever process pollutants emanated from the production process. With today's shift **in focus, you effectively control the environmental decision-making process.** Decisions you have the opportunity to make will allow implementation of a cost-effective pollution prevention program that will benefit the environment and your acquisition program.

The purpose of this chapter is to provide the information you need to effectively manage an acquisition pollution prevention program. The pollution prevention discussion is followed by an outline of appropriate program management techniques, You may review these sections in as much detail as you feel is necessary. These sections are intended to provide useful information and have been structured to

address key points in the first few paragraphs. You can review these first few paragraphs quickly to develop an understanding of the overall program concept. Or, you can elect to review the complete text and learn all the important details regarding the pollution prevention implementation process. You are encouraged to skip ahead on an as-needed basis.

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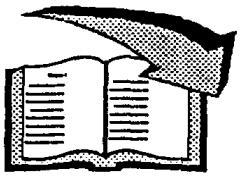
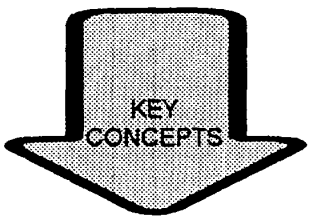


If you read nothing else in this entire guide, you should review the following discussion of key acquisition pollution prevention program concepts. These key concepts are the basic building blocks upon which the entire pollution prevention decision-making process is based. By reviewing these four key concepts and keeping them in mind during the program management decision-making process, you can successfully incorporate acquisition pollution prevention into your program.



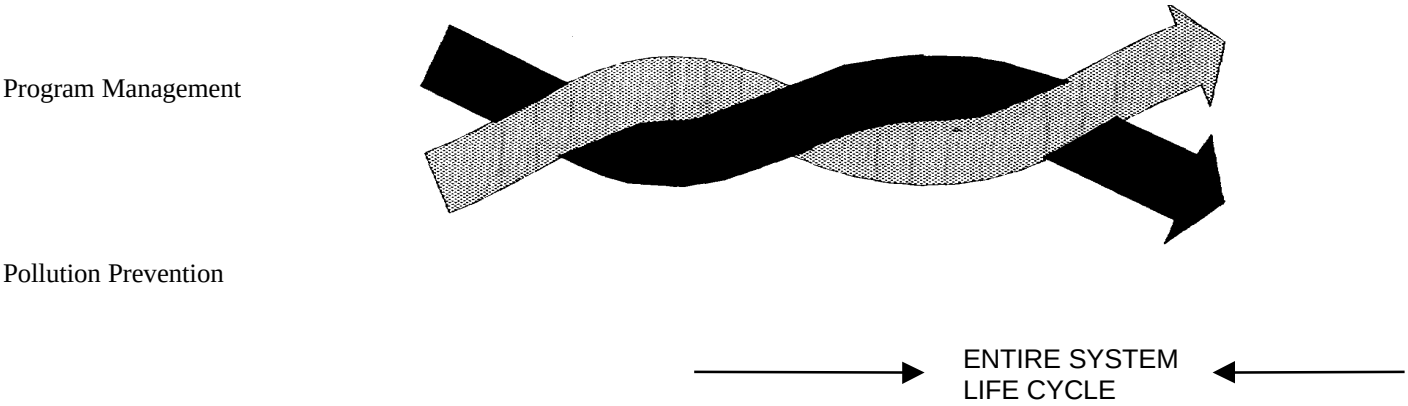
KEY POLLUTION PREVENTION CONCEPTS

- POLLUTION PREVENTION IS INTERTWINED WITH GOOD ACQUISITION PROGRAM MAMAGEMENT
- POLLUTION PREVENTION DECISIONS ARE BASED ONTRADE-OFF ANALYSIS
- EFECTIVE POLLUTION PREVENTION DECISIONS REFLECT SOUND BUSINESS PRACTICES
- POLLUTION PREVENTION IS NOT A PAPERWORK EXERCISE. IT IS A DECISION MAKING PROCESS

(These concepts are summarized on the following three pages)

The following discussion sections explain the meaning of these four **K**EY **P**OLLUTION **P**REVENTION **C**ONCEPTS relative to your acquisition program. These concepts reflect acquisition pollution prevention "best practices" and as such summarize the basic principles described in pollution prevention laws, policies, and regulations.

Pollution Prevention is Intertwined with good Acquisition Program Management



Pollution prevention is an integral part of the overall system acquisition program. It is not a "ticket" to be "punched" or a report to be prepared during a certain life-cycle phase. Pollution prevention is a component of effective acquisition decision-making. Pollution prevention analyses should cut across all functional disciplines and should not be an environmental "stove pipe." Pollution prevention should be part of the decision-making process for selecting materials, manufacturing processes, and support procedures. As part of the decision-making process, pollution prevention will be considered as one of the factors that must be weighed and balanced with other key life-cycle management issues.

Pollution Prevention Decisions are Based on Trade-off Analysis

Increased risk of performance degradation

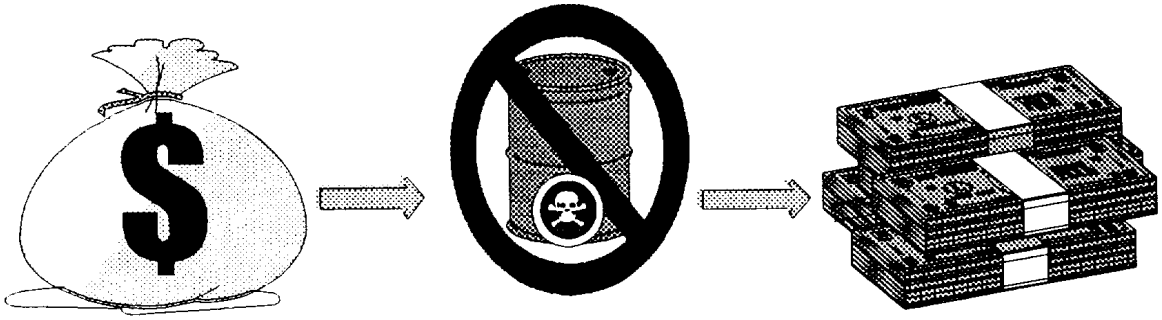
Increased potential! for schedule delays

Reduced environmental compliance risk

Reduced life-cycle cost

Pollution prevention and environmental management issues are based on trade-off analyses. As you make program management decisions, pollution prevention should provide you with the most efficient means of balancing environmental concerns with cost, schedule, and performance requirements. Trade-off decisions are based on analyses and conscious assessments of risks, benefits, and liabilities. Pollution prevention programs represent a beneficial means of looking at trade-off analyses in which changes in system design or manufacturing practices can be used to minimize adverse impacts on the environment and system operational performance. Because pollution prevention programs are based on trade-off analyses, there are no "right" or "wrong" decisions - only informed choices. Provided you consider pollution prevention as part of the decision-making process, you will be well on the way toward implementing an effective overall acquisition program consistent with best business practices.

Effective Pollution Prevention Decisions Reflect Sound Business Practices



INVESTMENTS

POLLUTION PREVENTION

RETURN OR SAVINGS

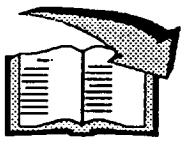
Pollution prevention should reduce your program costs and improve overall acquisition process efficiency. Private industry pollution prevention programs have demonstrated that they can pay for themselves in a short period, reduce risks, and maintain (or in some cases improve) product quality. As you consider pollution prevention trade-off analyses, you should apply the same sound business judgment to these decisions that you currently apply to overall program management. Your initial investments in a pollution prevention program (i.e., environmental analyses, research, etc.) should generate demonstrable benefits (i.e., reduced life-cycle costs, mitigated environmental risk factors, etc.) over a predetermined milestone period. Pollution prevention programs that do not generate some form of pay-back should be eliminated. If a pollution prevention approach cannot eliminate pollutant emissions, you may have to consider pollution-control-type systems to mitigate environmental impacts. In today's environmentally conscious world, acquisition pollution prevention programs are as much a part of sound business management practices as good cost accounting or effective contract administration.

Pollution Prevention Is Not a Paper Exercise, It Is a Decision-Making Process

Environmental analyses, such as those required by NEPA, are not intended to create paper, not even excellent paper; they are intended to promote action. The environmental analyses are intended to create opportunities for you to make better decisions. By effectively implementing a pollution prevention program you will be able to efficiently incorporate environmental issues into the overall acquisition program decision-making process. The result will be better decisions and a more environmentally friendly program.

The following sections are intended to provide you with a detailed discussion of how to "Develop an Acquisition Pollution Prevention Program" and how to "Manage an Acquisition Pollution Prevention Program." You are encouraged to review your program status and skip ahead to the sections that will be most useful to you.

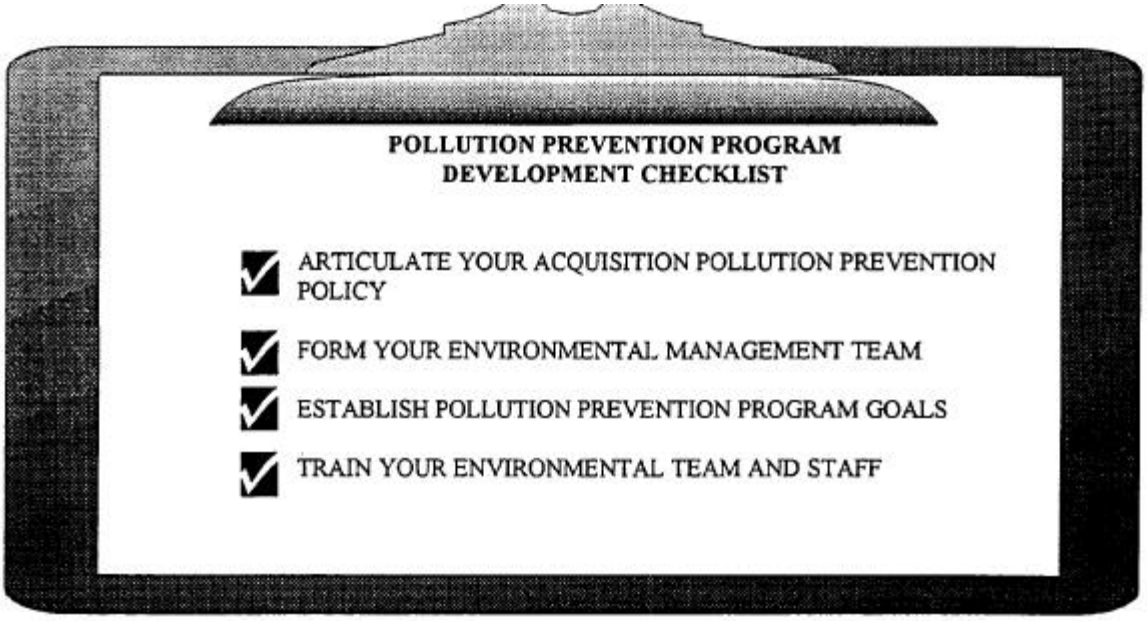
SKIP AHEAD AS NEEDED



DEVELOP AN ACQUISITION POLLUTION PREVENTION PROGRAM

The decisions you make regarding the development of an acquisition pollution prevention program will to a large degree control your ability to make effective decisions throughout the program life cycle. Many MATDEVs have found that investing time in the development of an effective pollution prevention program pays dividends throughout the life cycle. Although of significant importance, the development of an acquisition pollution prevention program does not follow a fixed or mandatory structure. You are encouraged to develop and tailor the acquisition pollution prevention program using any structure or approach that will effectively meet your program needs.

The discussion presented in this section describes how to establish a pollution prevention program and highlights approaches that other MATDEVs have found to be successful. These examples of successes from other programs can be applied to your program ~o minimize your "learning curve." You must tailor the pollution prevention program development steps described in this section to meet your specific program needs. Understanding that acquisition pollution prevention program development is a flexible process, tailored to meet your needs, a recommended prevention program development format includes the following four key features.

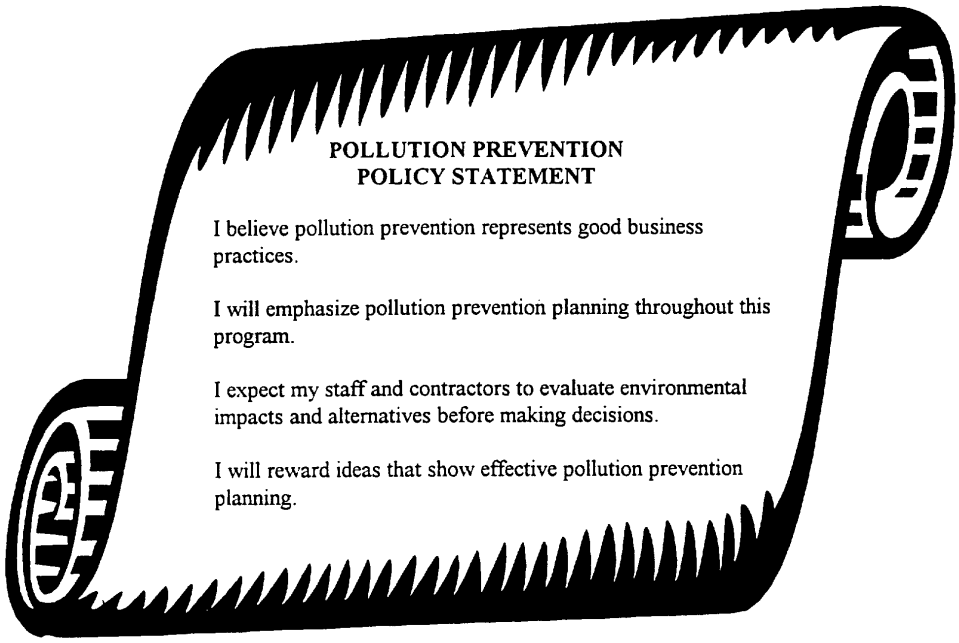


The following sections show how each of these four steps are important in creating a successful acquisition pollution prevention program. The overall concepts are described and brief examples illustrating the decision-making process are provided.

☑ Articulate Your Acquisition Pollution Prevention Program Policy

To be effective, all acquisition pollution prevention programs must be based on a "corporate culture" of environmental consciousness and awareness. By simply stating that pollution prevention and environmental consciousness are important, managers of major commercial industries have set the tone for overall corporate environmental success. Through the articulation of an environmental strategy focused heavily on acquisition pollution prevention, you have the opportunity to influence the life-cycle environmental impact of your system. If your staff, contractors, and program support personnel are aware that you consider pollution prevention to be a central part of your management philosophy, source reduction options will be consistently reviewed and included in the decision-making process.

Depending on the scope of your program, you may wish to issue a written policy statement emphasizing that you expect the environment and pollution prevention to become part of your program "corporate culture." The following are some examples of policy statement text that have been incorporated into effective acquisition pollution prevention policy statements:



After your acquisition pollution prevention policy is defined, you have the opportunity to decide whether or not to publicize your program outside of the Army. The decision to publicly announce your acquisition pollution prevention program can have significant positive impacts and you are encouraged to work with your Public Affairs Office to determine an appropriate strategy. As you are probably aware from television and print advertising, many major corporations (i.e., Mobil Oil, Dow Chemical, and Georgia Pacific) have developed sophisticated advertising campaigns describing their environmental programs. The reason these advertising campaigns have been developed is that environmental stewardship is viewed favorably by the general public. You should not ignore the possible public relations benefits derived from advertising your pollution prevention program within the government and to the public. As stated in the January 1989, "Defense Systems Management College, Program Manager's Notebook:"

> *"One of the biggest tasks that PMs will face is one of image. They should expect environmental concern to be a dominant political priority for the foreseeable future. As with financial matters, the appearance of wrongdoing can be just as detrimental as an illegal act. Environmental matters are subject to scrutiny at a very emotional /eve/."*

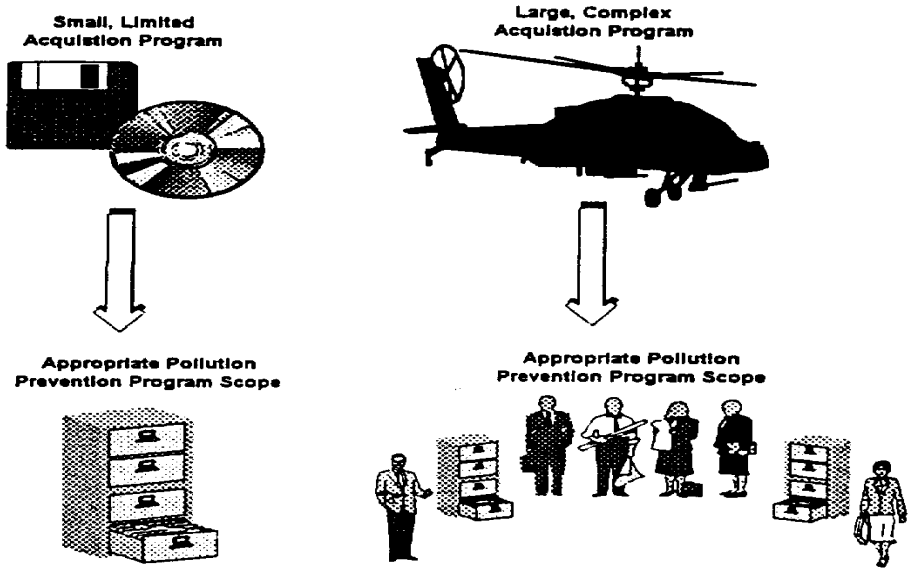
Given the public and congressional concern for the environment, proactive acquisition pollution prevention advertising will help you build the type of positive public image that can be an invaluable part of your acquisition program. As you are deciding what degree of publicity would be appropriate, you should remember that the Federal Facilities Compliance Act and the National Environmental Policy Act mandate public disclosure regarding significant environmental issues. By actively releasing environmental information to the public, you can create a valuable, positive, and open impression with the public. A positive public impression of an Army program can be invaluable.

Form Your Environmental (Pollution Prevention) Management Team

The most important decisions you can make during development of an acquisition pollution prevention program are related to identifying those resources that can effectively help you manage environmental issues in a "systems engineering" context. One recommended "systems engineering" approach to environmental management involves the development of a pollution prevention or environmental management team (EMT). Because pollution prevention is a process based on making decisions, your EMT must include adequate staff resources to address a wide variety of technical tasks.

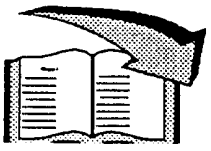
Although many MATDEVs have found that establishing an EMT is the most effective means of addressing pollution prevention issues, you are not required to employ this "systems engineering" management approach. You may decide that your program does not require an EMT, or that acquisition pollution prevention issues could be best handled using another, already established management structure. For example, good business practices dictate that if you are managing an acquisition program that is particularly small or that does not involve many environmental issues (i.e., acquisition of non-developmental foodstuffs or computer software), you don't need a large EMT. If you are managing a complex developmental acquisition program that will have significant environmental impacts, an effective EMT can help you address the numerous environmental issues that will evolve during the program life cycle.

Tailor Program Requirements to Reflect Acquisition Program Scope



Although you have a considerable degree of flexibility regarding whether or not to form an EMT, the remainder of this discussion will focus on the assumption that an EMT is warranted and that the EMT will have more than one or two staff members. If your program does not warrant a large EMT, feel free to skip ahead to the "Establish Program Goals and Baseline" portion of this chapter.

SKIP AHEAD



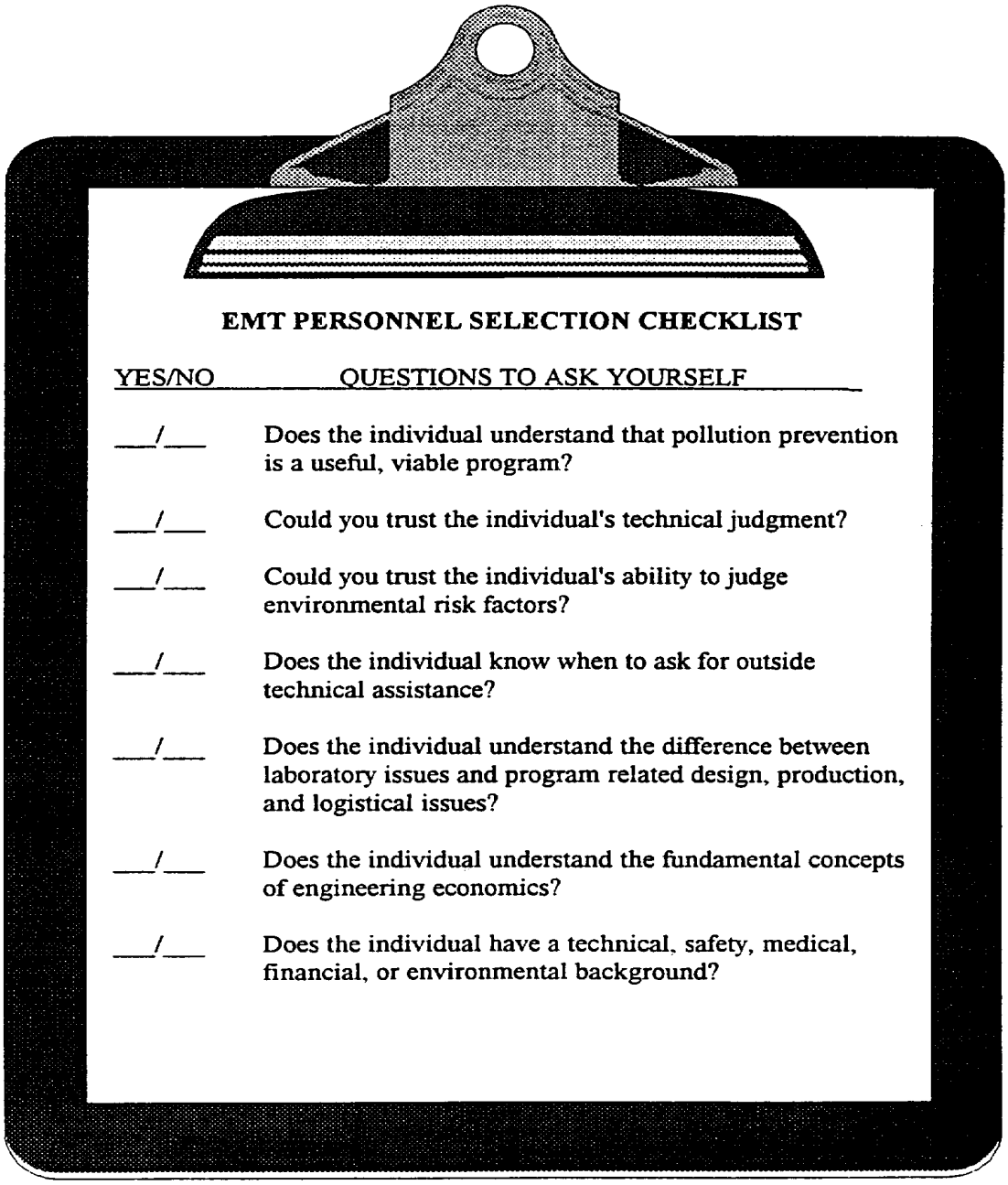
Establish Program Goals and Baseline section (page 42)

As mentioned earlier, the abilities of the personnel you include in your program EMT will impact the acquisition pollution prevention decision-making process. Personnel included in the EMT will act as your information filter and will have to evaluate inputs from many different technical disciplines to provide you with useful decision-making opportunities. Because numerous technical disciplines must be addressed as part of the acquisition pollution prevention process, your EMT should include personnel with a wide range of technical skill areas.

Suggested EMT Staff and Associated Core Skill Areas

- Acquisition program staff representing design, engineering, procurement, logistics, environmental, safety, legal, or financial professionals.
- Personnel with design, engineering, procurement, logistics, environmental, safety, legal, or financial expertise available from MACOM support activities.
- Personnel from matrix support organizations with skills related to key program requirements.
- Personnel from other Army or DoD activities with skills related to key program requirements.
- Representatives from contractor or other private industry groups with expertise in environmental or production management.

As shown above, the EMT core staff should include a cross-section of the acquisition community (including procurement specialists) as well as technical analysts. EMT members should be able to effectively evaluate which pollution prevention options most effectively balance mission requirements with cost, schedule, and performance risks. Given that personnel with the skill areas described above can be effective components of the EMT, the next most important considerations relate to the individual's ability to provide you with the kind of sound judgment you need to make effective decisions. Other MATDEVs have found that identifying personnel with sound judgment and an ability to effectively evaluate trade-off decisions is actually more important than identifying personnel with specific academic or professional credentials. The following is a checklist of considerations other MATDEVs have successfully applied to selecting members of an EMT that will be able to effectively contribute to the acquisition pollution prevention program decision-making process.



EMT PERSONNEL SELECTION CHECKLIST

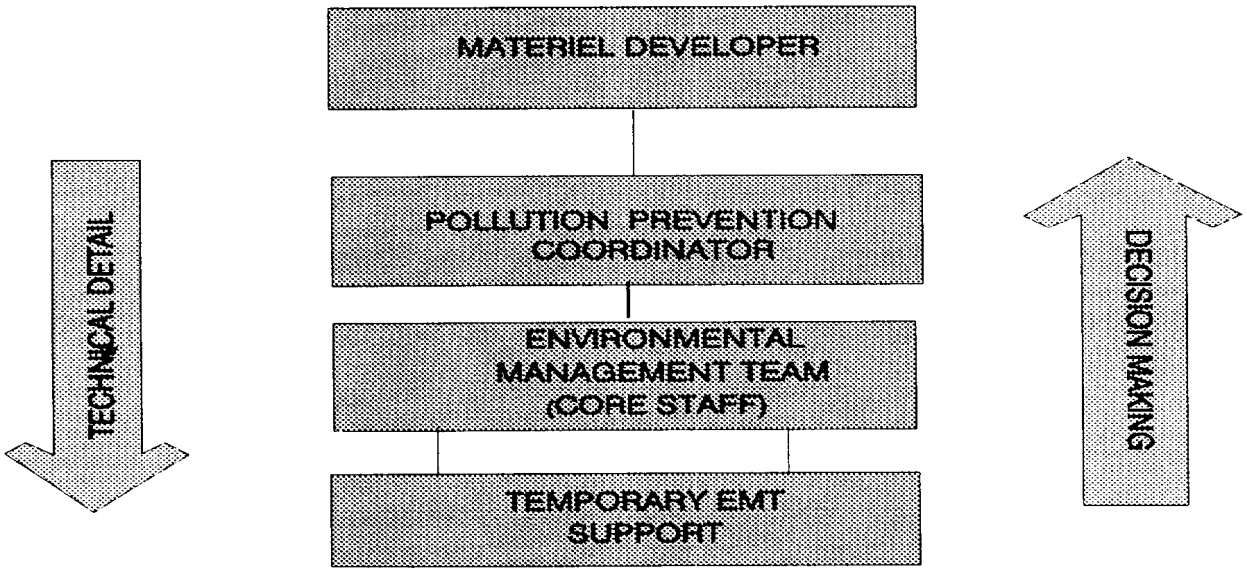
YES/NO	QUESTIONS TO ASK YOURSELF
___/___	Does the individual understand that pollution prevention is a useful, viable program?
___/___	Could you trust the individual's technical judgment?
___/___	Could you trust the individual's ability to judge environmental risk factors?
___/___	Does the individual know when to ask for outside technical assistance?
___/___	Does the individual understand the difference between laboratory issues and program related design, production, and logistical issues?
___/___	Does the individual understand the fundamental concepts of engineering economics?
___/___	Does the individual have a technical, safety, medical, financial, or environmental background?

If you can answer "yes" to most or all of these questions listed above for an individual, that person is likely to be an effective candidate for your EMT. As you review both the qualifications and attitudes of the personnel you plan to include in the EMT, always remember that the advice and judgment these individuals provide to you will impact legally mandated environmental program requirements. Your program, and perhaps even your career, will be at risk if the personnel included on the EMT do not effectively address environmental laws, policies, and requirements.

Once you have decided upon an appropriate number of personnel and identified the individuals that will provide you with sound environmental judgment, effectively organizing the EMT is your next most important decision-making opportunity. Again, there is no fixed or defined structure for organizing and managing your EMT. If your EMT consists of only two or three people, a complex management structure is not really needed. However, if you are developing a large EMT that will have to address many complex issues, an effective management structure is essential.

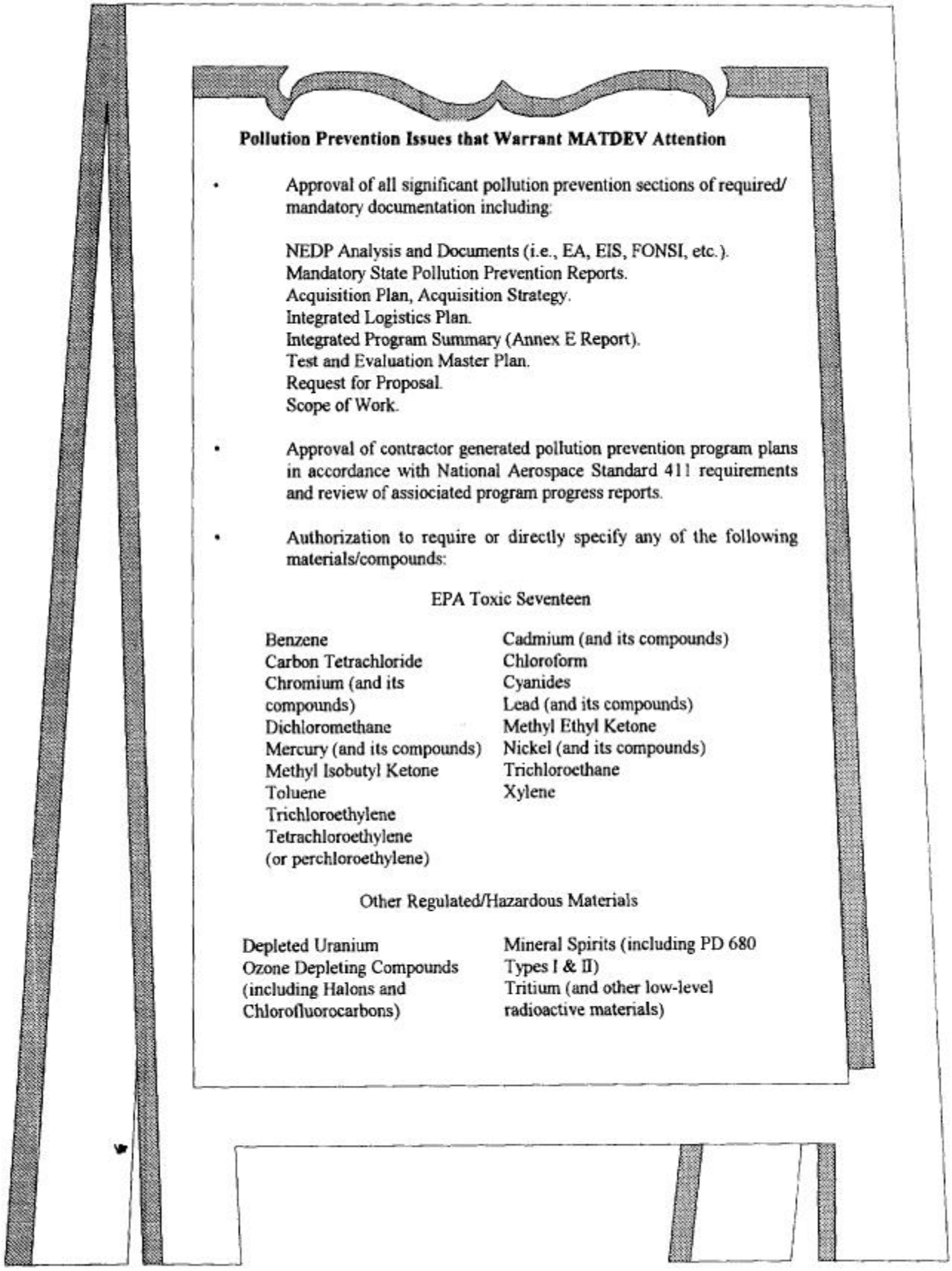
Because there are no fixed EMT management structures, you may elect to use any format that you feel will produce effective results. You may review your existing program management structure and feel that an EMT is redundant or that the EMT mission could be performed by a System Safety Working Group (SSWG), MAN PRINT Joint Working Group (MJWG), or some other existing program environment/worker-health-oriented organization. Considering that the SSWG, as described in MIL-STD-882C, "System Safety Program Requirements," already addresses issues of worker/soldier safety as related to hazardous materials, using this management structure to support the EMT could be beneficial. However, the SSWG and other established organizational structures typically have missions that might dilute EMT acquisition pollution prevention program activities. The recommended EMT program management structure involves developing an independent organization that ,cuts across all program functional areas and reports directly to you.

The concept of an independent EMT with interfaces across all program functional areas has proven to be a successful management structure for many acquisition programs. The key concept associated with developing an independent EMT management structure is that it should act as a filtering mechanism to produce useful decision-making opportunities. The following shows an example of an EMT management structure that will effectively act as a decision-making filter:



The EMT management structure presented above shows that you are the ultimate decision-making authority for the acquisition pollution prevention program. Reporting directly to you is the Pollution Prevention Coordinator (PPC). The PPC acts as your full-time representative to the EMT and provides you with a central point of contact for communicating with the group. The PPC is part of the core EMT staff that includes those personnel who will continue to work on the pollution prevention program throughout the life cycle. The core EMT staff should be manageably small and should include the personnel identified earlier using the **EMT PERSONNEL SELECTION CHECKLIST**. Supporting the core EMT staff should be a fluid group of technical, environmental, financial, or other experts that can be drawn upon to provide specific input on specific pollution prevention issues. As shown by the arrows on the **R**ECOMMENDED **P**OLLUTION **P**REVENTION **M**ANAGEMENT **S**TRUCTURE graphic, it is these part-time or temporary EMT members that will conduct the bulk of the detailed technical analyses required to generate decision-making opportunities. As issues filter up through the EMT and the PPC, the level of technical detail should decrease. When a pollution prevention issue is presented to you, the technical details should have been addressed and your PPC/EMT should be able to answer your technical questions in terms of relative impacts on cost, schedule, and performance risks.

Conversely, the pollution prevention decision-making authority should flow down from you through the PPC to the EMT. Your PPC and EMT should have the authority to authorize research programs, conduct analyses, and implement low-risk pollution prevention system modifications. For example, it is your EMT, not you personally, that should address replacing all hazardous materials and tracking contractor hazardous material elimination progress. However, you are the ultimate program decision-making authority and are responsible for program environmental compliance. You can be held legally responsible for egregious violations and cannot delegate this responsibility. To provide some guidance regarding the types of issues that should be addressed by you, the MATDEV, the following is a key issue list. **This list is focused on the high-level decisions and does not include the day-to-day issues that should be addressed by the PPC/EMT**.



Pollution Prevention Issues that Warrant MATDEV Attention

- Approval of all significant pollution prevention sections of required/ mandatory documentation including:

  NEDP Analysis and Documents (i.e., EA, EIS, FONSI, etc.).
  Mandatory State Pollution Prevention Reports.
  Acquisition Plan, Acquisition Strategy.
  Integrated Logistics Plan.
  Integrated Program Summary (Annex E Report).
  Test and Evaluation Master Plan.
  Request for Proposal.
  Scope of Work.

- Approval of contractor generated pollution prevention program plans in accordance with National Aerospace Standard 411 requirements and review of assiociated program progress reports.

- Authorization to require or directly specify any of the following materials/compounds:

EPA Toxic Seventeen

Benzene	Cadmium (and its compounds)
Carbon Tetrachloride	Chloroform
Chromium (and its compounds)	Cyanides
Dichloromethane	Lead (and its compounds)
Mercury (and its compounds)	Methyl Ethyl Ketone
Methyl Isobutyl Ketone	Nickel (and its compounds)
Toluene	Trichloroethane
Trichloroethylene	Xylene
Tetrachloroethylene (or perchloroethylene)	

Other Regulated/Hazardous Materials

Depleted Uranium	Mineral Spirits (including PD 680 Types I & II)
Ozone Depleting Compounds (including Halons and Chlorofluorocarbons)	Tritium (and other low-level radioactive materials)

A brief review of the **Pollution Prevention Issues that Warrant MATDEV Attention** list presented above reveals that only the most significant pollution prevention issues should flow up to you for a decision. Less significant, although important, issues related to materials evaluation, alternative assessment, and other "day-to-day" environmental analyses should be handled at the EMT or PPC level and simply included in the progress reports you review/approve. Other MATDEVs have found that focusing on the significant program decisions, while simultaneously allowing the EMT the flexibility to implement low-risk pollution prevention process modifications, has resulted in an efficient management structure.

The brief **Pollution Prevention Issues that Warrant MATDEV Attention** list shown above represents a pollution prevention program "best practices" example and is not intended as a binding list of requirements. This list is intended as a starting point from which you can tailor program-specific management requirements. By successfully developing a management structure that includes your input on key decisions, but allows your EMT enough autonomy to be efficient, you will be able to effectively implement a successful acquisition pollution prevention program.

Establish Program Goals and Program Baseline

After establishing a pollution prevention program, some decisions should be made regarding the overall program goals. Acquisition pollution prevention program goals must reflect established National, Army, and DoD policies and should be designed to produce as much economic or risk reduction return as possible for your program. The following provides a short list of some acquisition pollution prevention program goals that other MATDEVs have found to be effective.

Possible Pollution Prevention Program Goals

- Eliminate hazardous metal plating from production processes by 1996.
- Reduce number of hazardous materials included in technical manuals by 25% from a 1993 baseline.
- Eliminate applications for CFCs and Halon in weapon and support systems.
- Reduce costs associated with hazardous materials usage by 50% from a 1993 baseline.
- Reduce compliance equipment/operations costs through source reduction from a 1993 baseline.

In addition to the goals described above, you may choose to develop other more program-specific goals. These goals might be related to uses for specific hazardous materials, costs, or other program issues.

All program goals should be tailored to satisfy your specific requirements. By using defined progress measurements, you can manage program progress and avoid the "study to death" syndrome. As the program goals are developed, an accurate program baseline should be established to allow you to measure progress. Because pollution prevention program progress is typically measured as a reduction or change in the amounts of hazardous materials used or procured, accurate baseline data is essential. Accurate, useful baseline data should include:

Develop Program Baseline Data

- Number of hazardous materials directly included in the system design (i.e., cadmium plated fasteners or depleted uranium armor).
- Number of-hazardous-materials-based processes required in production, operations, maintenance, or demilitarization procedures (i.e., solvent vapor alegreasing or open burning of energetics).
- Number of ozone-depleting compounds (i.e., CFCs and Halons) and other regulated materials included in the design.

By defining an accurate program baseline and effectively measuring pollution prevention progress, you will be able to track overall success. The decisions you and your EMT make throughout the program will contribute to attaining the program goals.

As the acquisition decision-making authority for your program, you have the opportunity to minimize environmental impacts and associated costs through pollution prevention. By setting challenging program goals, forcing real change (as opposed to numbers games), and making effective implementation decisions, you can reduce program environmental impacts and life-cycle costs.

Train Your Environmental Management Team and Staff

The ability of you and your core EMT staff to effectively implement and execute an acquisition pollution prevention program is based on knowledge. You or some of your staff may have a background in materials selection, environmental analysis, or other technical fields that allow you to understand and implement pollution prevention. However, in many cases pollution prevention will be a completely new concept and some form of training will be required. By deciding on an appropriate level of training for you and your staff, you have an opportunity to create a successful acquisition pollution prevention program.

Given that environmental issues can involve direct, personal liabilities, a key decision you will have to make relates to your own level of training. You **cannot delegate** your environmental responsibility and as such you may find some degree of training personally beneficial. Participating in any of the following environmental or

pollution prevention training programs will allow you and your staff to better understand environmental issues, laws, and the decision-making process:

POLLUTION PREVENTION TRAINING RESOURCES FOR THE MATER/EL DEVELOPER

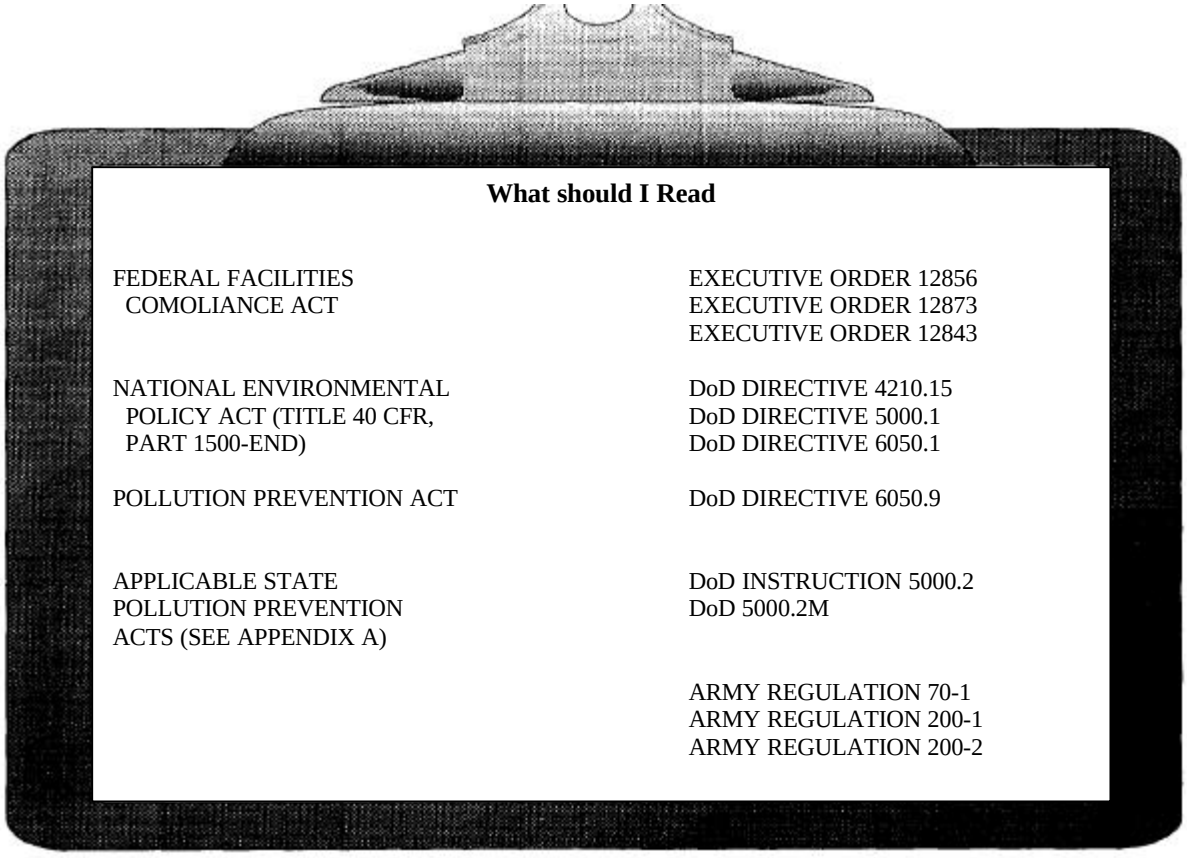
Management Awareness Briefings are available from the Army Acquisition Pollution Prevention Support Office (AAPPSO) for all MATDEV-Level acquisition staff. These briefings range in length from two hours to two days and can be conducted by AAPPSO representatives at your facility. These briefings are directed at you and your acquisition management staff.

The Defense Systems Management College (DSMC), as part of the Program Manager course, provides two awareness sessions on environmental issues that affect acquisition managers.

The U.S. Army Logistics Management College has a series of training programs covering the Army Acquisition Pollution Prevention Program, the National Defense Center for Environmental Excellence, and Federal/Army regulations related to pollution prevention (i.e.., AR 70-1 and DoDD 5000.1). The programs cover manufacturing and the process by which hazardous materials can create hazardous pollutants. The programs are structured for environmental coordinators, engineers, and other staffers (Grade GS-9 and above). [Source: DoD Directory of Training Resources, May 1994.]

The U.S. Army School of Engineering and Logistics has modified the current programs of instruction (POD for the various engineering intemships to address acquisition pollution prevention. The instruction program creates awareness of the environment and provides personnel with a fundamental understanding of acquisition pollution prevention. The program emphasizes environmental law, material/industrial process selection, life-cycle planning, and selected special topics. Also, POIs for the Supply and Maintenance Management interns have been modified to address acquisition pollution prevention.

If you do not have the time, or do not feel the need, to attend specific training sessions, you can still learn about key pollution prevention program requirements by reviewing the documents included on the **W**HAT **I S**HOULD **R**EAD list.



Once you are comfortable with your own training level, the next step is to determine an appropriate level of staff training. There are literally dozens of pollution prevention training programs, provided by Federal, state, and Army activities, available for members of your staff. These programs cover a wide range of technical detail and are applicable to personnel at different levels within your organization. A list of staff pollution prevention training resources is presented in **Appendix D**.

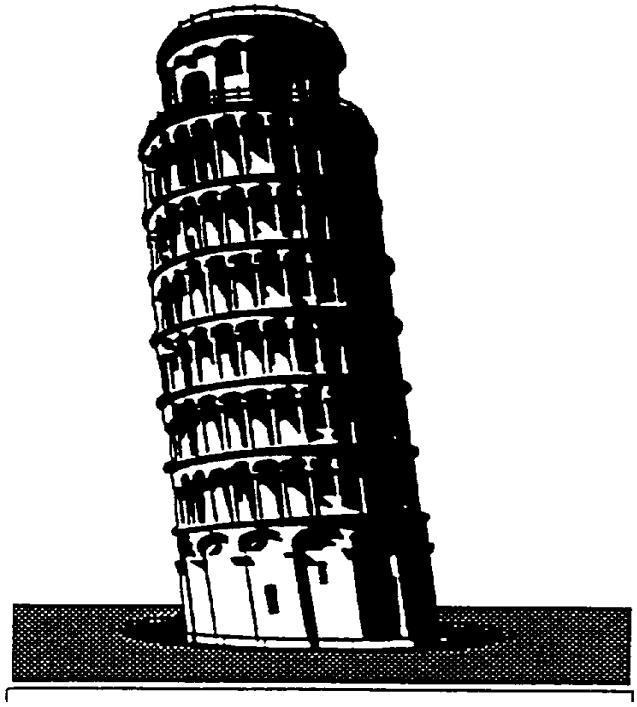
Many MATDEVs have found that sending a few program staff members to some of the training programs listed in Appendix D is an effective means of bringing useful information into the acquisition program at a minimal cost. The members of your staff attending the various pollution prevention training sessions should be tasked with collecting the information presented and then preparing "in-house" training for the rest of your staff. Thus, the key or important information presented in the training sessions can be readily disseminated throughout your program.

Most pollution prevention training resources are available to you and to your staff for a minimal investment of funds/time. By effectively leveraging these training resources, you and your staff will develop a more comprehensive understanding of key acquisition pollution prevention program issues. This understanding is a central portion of the foundation upon which a successful acquisition pollution prevention program is based.

MANAGE AN ACQUISITION POLLUTION PREVENTION PROGRAM

The acquisition pollution prevention program decision-making or management process is an integral part of the overall acquisition life cycle. Pollution prevention is a major subset of the NEPA process and is an important environmental tool that can help you reduce risks and cut costs during every program life-cycle phase. A **key point to remember** is that pollution prevention and environmental management in general are an integral part of the acquisition process. Inadequate or incomplete environmental consideration and documentation can be as detrimental to your program as poor cost accounting. If your program does not have a sound pollution prevention "foundation," including the environmental documentation typically generated in early life-cycle **phases, you and your program may be at risk.**

A Sound Environmental Documentation "Foundation" Controls Future Program Success



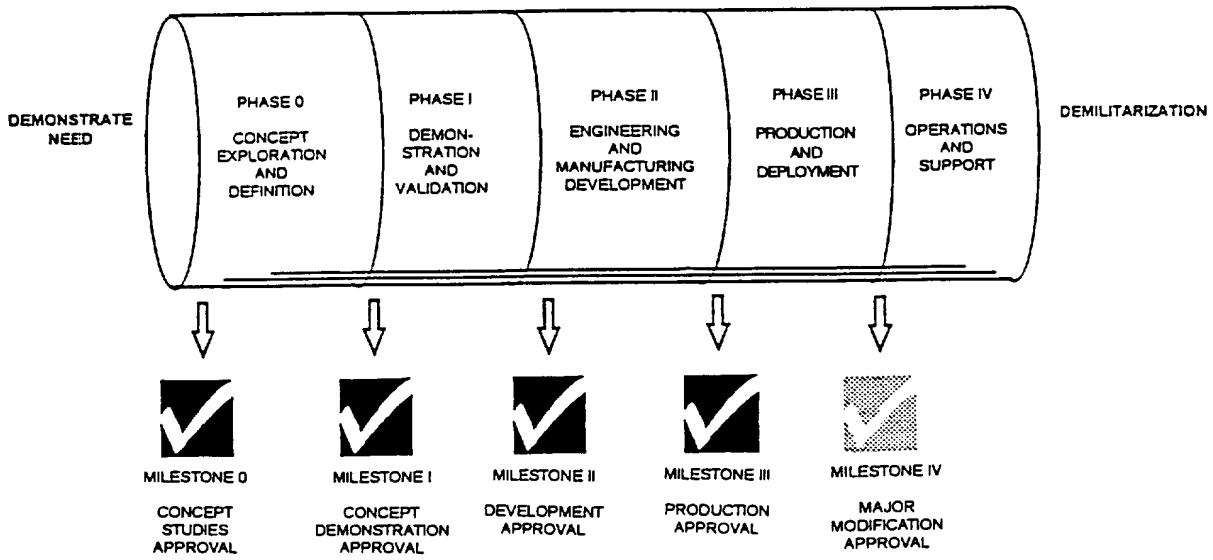
NEGLECTED ENVIRONMENTAL MANAGEMENT/DOCUMENTATION

Many already established acquisition programs do not have adequate environmental documentation. Historically, environmental documentation development has been a relatively low priority and in many programs, may never have been produced. Today, comprehensive environmental documentation is a required part of the Integrated Program Summary and is critically reviewed at milestone decision points. Recent reports by the DoD Inspector General have been critical of programs that do not have a solid environmental documentation "foundation." Many MATDEVs managing acquisition programs in advanced life-cycle phases have found that a careful review of the program environmental documentation "foundation" can identify deficiencies before they become a problem. You might elect to review your environmental documentation "foundation" to help identify any potential deficiencies.

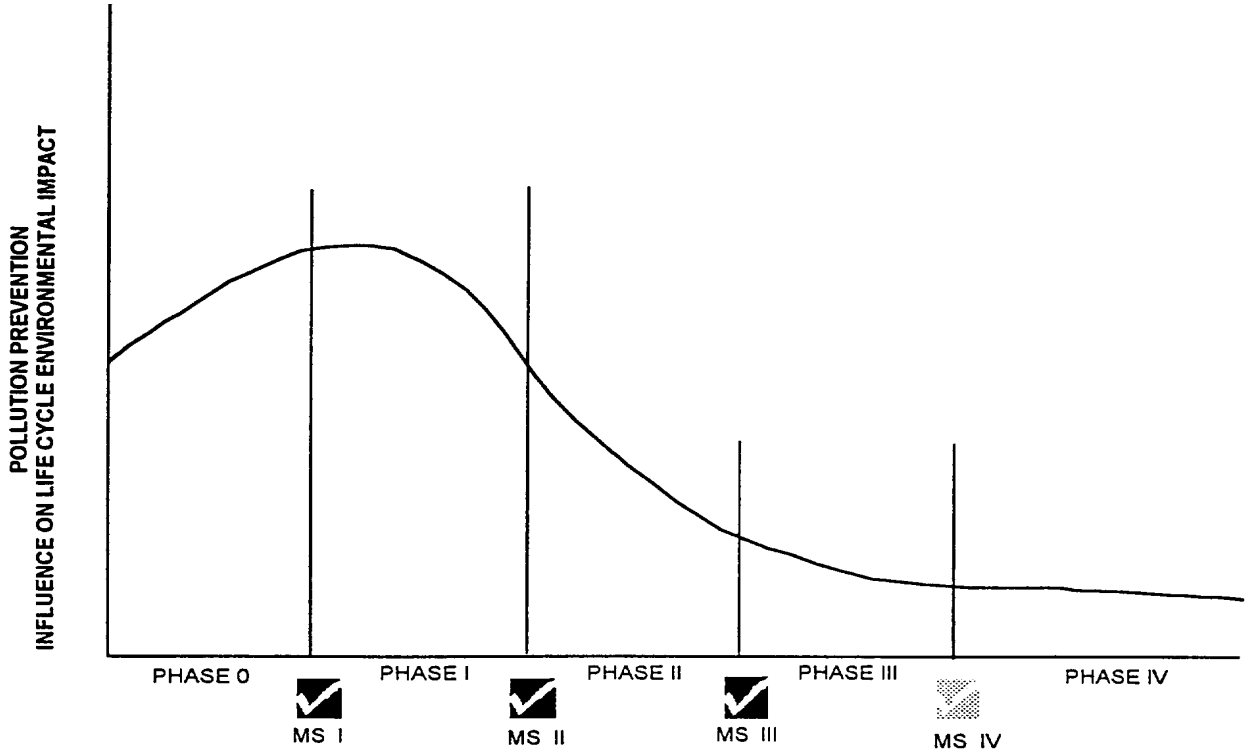
Another key concept to consider is that the pollution prevention process is ongoing throughout the system life cycle. You cannot set a date and then say, "by this date I will satisfy my acquisition pollution prevention requirements." Acquisition pollution prevention implementation is an **on-going process** that can reduce program environmental risks and cut costs during every life-cycle phase.

Understanding that acquisition pollution prevention is an ongoing process, in which actions in one life cycle phase are built on those in previous phases, the most effective means of viewing this process is as a flow through a "pipeline." The following schematic diagram shows the familiar acquisition program as a "pipeline" and highlights the specific program milestones. The concept of a "pipeline" is important to the subsequent phase discussions in that many tasks such as incorporating pollution prevention into program documentation and managing the EMT are concepts that flow through the entire acquisition process. If you think of the acquisition process as a "pipeline," all key program elements such as risk assessment, cost analysis, and pollution prevention are simply issues that flow concurrently through the process.

ACQUISITION LIFE CYCLE



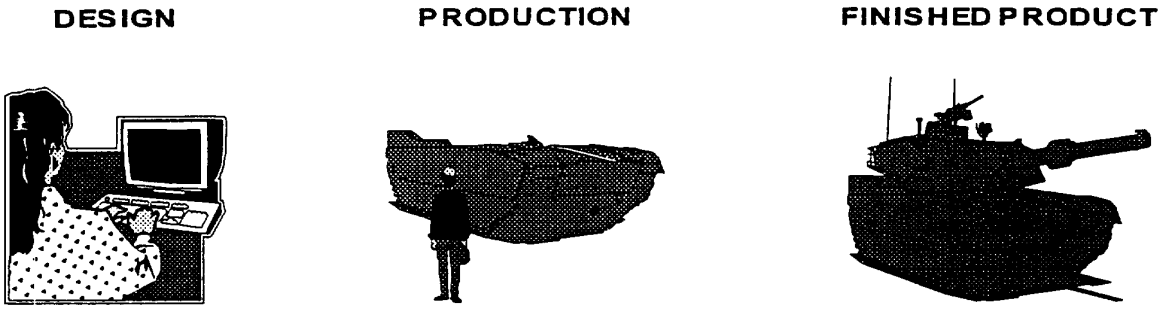
As a system acquisition program progresses through the life cycle, the pollution prevention decision-making opportunities available to you will change. These changes relate to your overall ability to use pollution prevention to exert a positive influence on the environment and your system life-cycle costs. The following diagram shows how pollution prevention decisions made during the earlier life-cycle phases exert a far greater impact on the environment and life-cycle costs than decisions made in later life-cycle phases.



ACQUISITION LIFE CYCLE PHASE

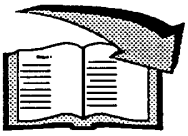
As shown above, pollution prevention decisions made during the early acquisition phases will have the greatest life-cycle environmental impact. The reason decisions made early in the acquisition process can have such a major impact is that design parameters can be shifted to accommodate pollution prevention process modifications or changes. After the design has been completed and the hardware has been produced, the pollution prevention decision-making process becomes more complicated by the interplay between numerous technical issues. These technical issues constrain your pollution prevention decision-making opportunities with safety, reliability, supportability, and other performance criteria. These constraints do not preclude pollution prevention decision-making, they simply make the process more complex.

When is It Easier to Make a Change?



The remainder of this discussion section summarizes the detailed conceptual analyses, decision-making opportunities, and in some cases required documentation/ reports associated with each of the life-cycle phases shown in the ACQUISITION LIFE CYCLE schematic. The discussion will show individual issues as they "flow" from one phase to the next through the acquisition pipeline. Whenever appropriate, checklists or key documents that must be completed by a certain point in the life cycle are highlighted. This format will allow you to rapidly and effectively review the entire life cycle acquisition pollution prevention process and also to skip ahead to whatever sections you feel are the most useful to your specific program.

SKIP AHEAD AS NEEDED



Determination of Mission Need

The Determination of Mission Need represents the start of the acquisition process "pipeline." During the pre-Milestone 0, Determination of Mission Need, the Combat Developers will focus primarily on doctrine and conceptual issues. As such, tile Combat Developer is unlikely to directly define environmental risk factors that would be amenable to pollution prevention mitigation analyses.

The primary activities into which the Combat Developer will have the opportunity to infuse pollution prevention during the pre-Milestone 0 period relates to the development of preliminary Phase 0, Concept Exploration and Definition (CED), contractual documentation. Preliminary documents that will evolve into the Acquisition Strategy and other contractual/management documents should include pollution prevention requirements. Programs that effectively infuse pollution prevention planning into these early activities, documents, and plans have found that subsequent acquisition pollution prevention implementation is relatively straightforward.

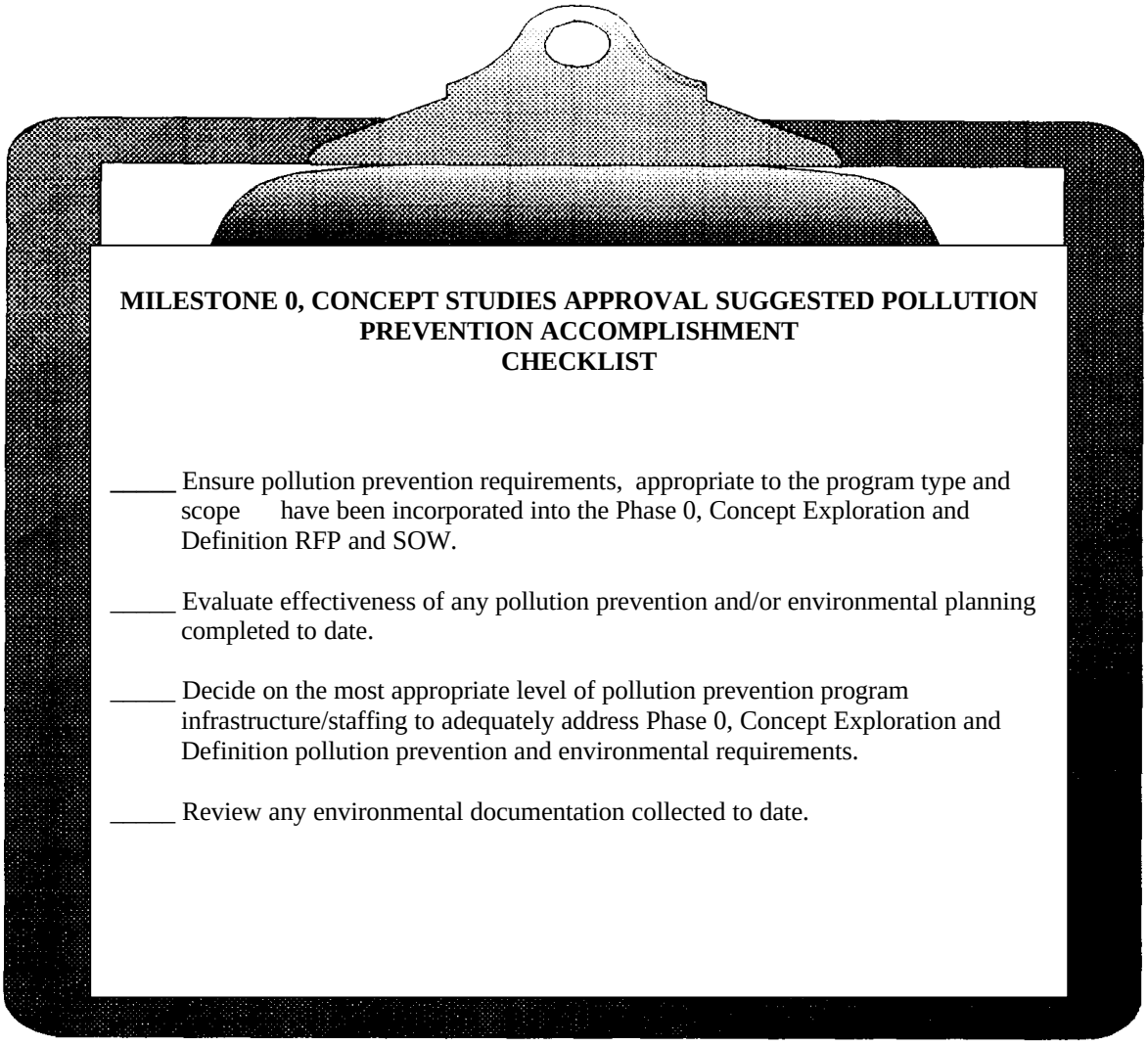
The following are some key pollution prevention program issues that may be appropriate for consideration during the pre-Milestone 0 development of the Mission Need Statement. These issues represent suggestions that can be tailored for use in programs of differing scope and do not represent required actions. As the Combat Developer staff begins to transition program tasks to the MATDEV, the following list of issues could be used as a basis for initiating acquisition pollution preventing program development.

Key Pre-Milestone 0 Pollution Prevention Considerations

- If appropriate, include pollution prevention in the draft documentation that will evolve into the Acquisition Strategy.
- If appropriate, collect environmental documentation (e.g., environmental assessments from similar systems) and establish an initial program environmental documentation foundation.
- If appropriate, initiate the planning process for the incorporation of pollution prevention requirements into subsequent phase Request for Proposal (RFP) and Scope of Work (SOW) documents.

Milestone 0 - Concept Studies Approval

The translation of a Mission Need Statement through the Milestone 0, Concept Studies Approval, represents the initiation of the acquisition process (although not necessarily the acquisition program) or the beginning of the "pipeline." Pollution prevention decision-making opportunities as part of the Milestone 0 review process relate to the effectiveness with which environmental issues flow into the Phase 0, Concept Exploration and Definition, activities. Because passage through Milestone 0 does not define an actual system, but merely authorizes concept definition studies to evaluate alternative concepts that could satisfy the Mission Need Statement, pollution prevention planning requirements are highly dependent on program scope. Understanding that some programs may require far more pollution prevention planning than others, the following is a checklist of environmental issues that could help you during the Milestone 0 review.



MILESTONE 0, CONCEPT STUDIES APPROVAL SUGGESTED POLLUTION PREVENTION ACCOMPLISHMENT CHECKLIST

_____ Ensure pollution prevention requirements, appropriate to the program type and scope have been incorporated into the Phase 0, Concept Exploration and Definition RFP and SOW.

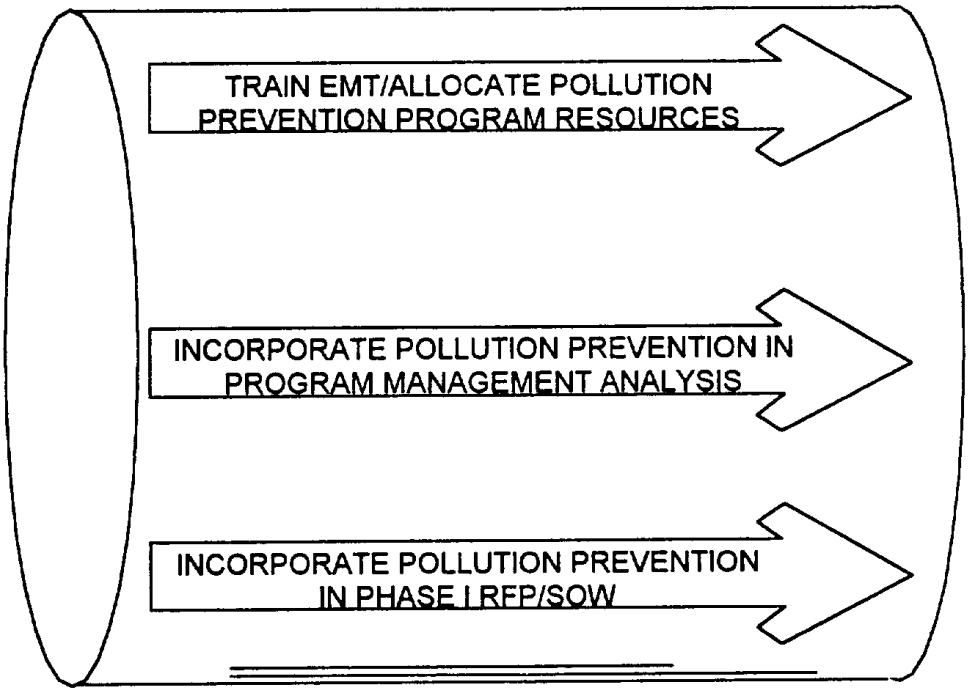
_____ Evaluate effectiveness of any pollution prevention and/or environmental planning completed to date.

_____ Decide on the most appropriate level of pollution prevention program infrastructure/staffing to adequately address Phase 0, Concept Exploration and Definition pollution prevention and environmental requirements.

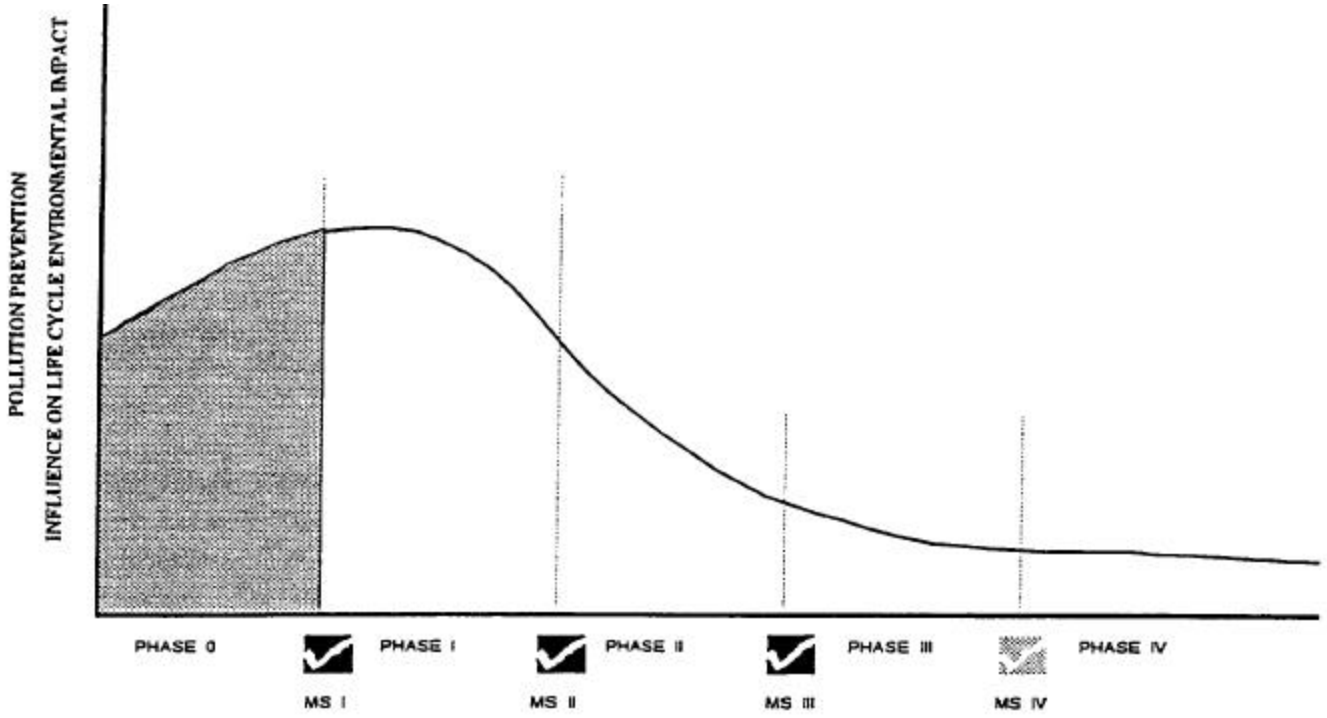
_____ Review any environmental documentation collected to date.

Phase 0 - Concept Exploration and Definition (CED)

After the combat developer passes Milestone 0, the program is really entering the life-cycle phases in which pollution prevention can be effectively implemented. The following Phase 0 - CED discussion presents some of these opportunities.



During Phase 0 - CED there are numerous opportunities to make decisions regarding pollution prevention program development and implementation. These opportunities are shown above as three key task areas. The degree to which these key task areas are addressed relates to the overall program scope and the application of good business practices. The following schematic diagram illustrates how pollution prevention decisions made during Phase 0 - CED can have a significant life-cycle environmental impact:



ACQUISITION LIFE CYCLE PHASE

As shown above, the influence of the pollution prevention program on life-cycle environmental impact is significant during Phase 0 - CED, but actually peaks at or near Milestone I. Decisions made during Phase 0 - CED will not have as significant an impact on the environment as those made during Phase I because the design is still in the concept stage and the specific details needed to implement pollution prevention have not yet been defined. However, by creating an effective pollution prevention program during Phase 0 - CED all subsequent decision-making will be influenced and overall system life-cycle environmental impacts will be reduced. Reducing overall system life-cycle environmental impacts will correspondingly reduce life-cycle costs and the risks associated with hazardous materials use.

The analysis of trade-offs between competing concepts occurring during Phase 0 - CED creates numerous opportunities for acquisition pollution prevention implementation. Decisions made during Phase 0 - CED will develop the foundation upon which substantive pollution prevention implementation will occur in later program phases.

Phase 0 - CED also provides opportunities to assess the ongoing weapon system concepts being developed and estimate the future program pollution prevention needs. Based on program scope and projected environmental/worker health hazards, allocation of training resources to your EMT personnel can also be initiated during Phase 0 - CED. The training activities can be concurrent with program development

and should be tailored to reflect the evolving weapon system concepts. In addition to staff training, opportunities to allocate personnel resources in a proactive mode will become apparent. Decisions made during this life-cycle phase will create an effective EMT throughout the subsequent acquisition cycle. By allocating personnel resources **early** in the program evolution, surprises related to future pollution prevention requirements can be avoided.

The exploratory nature of the Phase 0 - CED activities inherently makes pollution prevention requirements difficult to define. The following discussion sections describe the key pollution prevention phase task areas presented in the Phase 0 - CED flow graphic on page 52.

Contractors should be required to **incorporate pollution prevention** as part **of the Phase 0 - CED contract.** Effectively tailoring the pollution prevention analyses to the program scope and hazardous materials issues will ensure that most environmental options associated with design and manufacturing are considered. As a general "rule of thumb," pollution prevention should be considered as part of the evaluation process for competing concepts via both the industrial base assessment and the cost effectiveness evaluation. The competing concepts that include effective pollution prevention programs will inherently exhibit greater industrial base flexibility and lower life cycle costs. Although you have a considerable degree of flexibility in deciding how to effectively review the pollution prevention program, the following are five recommended review practices that will help you ensure the contractor has effectively adopted pollution prevention.

Recommended CED Contractor Review Practices to Ensure Effective Pollution Prevention Implementation

1. Require that the contractor develop pollution prevention schedules and milestones (including completion dates for key acquisition pollution prevention tasks). Examples of key pollution prevention program tasks include assessment of alternatives for hazardous materials/processes, hazard assessments, life-cycle cost analyses, etc.

2. Evaluate the contractor's plan for incorporating pollution prevention into all subsequent acquisition program phases. Effective acquisition pollution prevention programs will integrate EMT activities with all system engineering and functional program activities. Ineffective programs will "stove pipe" pollution prevention as an environmental issue.

3. Evaluate the contractor's planning for future pollution prevention requirements. Contractors should identify requirements for manufacturing, science, and technology (MS&T), and research, development, test, and evaluation (RDT&E) programs to support pollution prevention. Effective contractor programs will only propose the use of research funds to solve system-unique environmental problems. Ineffective programs will research everything, without regard for ongoing DoD, Army, MACOM, civilian, or other MS&T/RDT&E efforts.

4. Require the contractor to develop plans for evaluating hazardous material process risks. These plans may be developed in accordance with National Aerospace Standard 411, "Hazardous Materials Management Program" requirements (as described on page 57) or state/local policy guidelines. You should review these plans to ensure the contractor has a viable concept (i.e., logical plan that the contractor can implement and you can evaluate) for identifying those materials/processes that present significant environmental risks.

5. Evaluate the contractor's collection of environmental program baseline data. The contractor should collect enough background environmental data to start generating a programmatic environmental analysis after passing Milestone I - Concept Demonstration Approval. The programmatic environmental analysis (PEA) is a decision-making tool that should address the impacts of the proposed system on the environment throughout the system life-cycle. Baseline data for the future development of the PEA should include:

- Analysis of projected design features and associated environmental impacts. For example, does one concept require the use of hazardous materials, while another concept has already used pollution prevention to eliminate hazardous materials requirements?

- Analysis of systems similar to the concepts being explored that might provide some background regarding the environmental "learning curve."

- Analysis of industrial base capability to determine appropriate scope for the PEA development process.

- Analysis of competing concept technologies for their relative environmental impacts.

- Analysis of NEPA and any other environmental requirements.

In general, all Phase 0 - CED contractor generated pollution prevention program requirements should reflect good business practices. The funding that you commit to support the proposed development of a pollution prevention program (i.e., MS&T or RDT&E "seed money") should be directly related to the environmental/economic benefits you intend to derive throughout the remainder of the life cycle. Other MATDEVs have found that some contractors feel pollution prevention is a multi-million dollar requirement that will add to your program costs. Any contractor that views pollution prevention as a high-cost item does not understand that the most important concept is to avoid expensive environmental impacts and save money.

POLLUTION PREVENTION IS NOT A HIGH COST ITEM

During this phase you should try to infuse pollution prevention into all key program documentation. You are encouraged to tailor the development of all key program documents to include pollution prevention in a manner that makes good business sense. The following lists documents that could, if appropriate, include pollution prevention and environmental planning comments:

Infuse Pollution Prevention into Program Documents

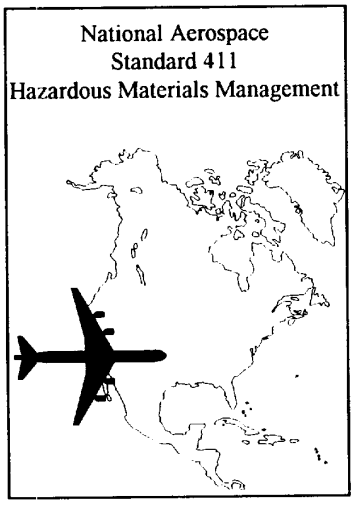
- Integrated Program Summary (including Acquisition Strategy, Risk Assessment, Life-cycle Cost Estimate, and Environmental Analysis).
- Test and Evaluation Master Plan (including any required environmental impact statements for test locations.)
- Integrated Logistics Plan.
- System MANPRINT Management Plan.
- System Safety Management Plan.

As was the case with the contractor's management activities, the implementation of pollution prevention and environmental considerations into Phase 0 - CED program documents represents a foundation or first tier upon which later phase analyses will be added. Remember, by infusing pollution prevention into the acquisition program early, subsequent program efforts will effectively minimize adverse environmental impacts and save money.

As Phase 0 - CED progresses, you will have opportunities to **incorporate pollution prevention requirements into Phase I - Demonstration and Validation contract requirements.** How you incorporate pollution prevention into Phase I -Demonstration and Validation program requirements is again based on the scope and complexity of your acquisition program. The key issue is to incorporate contract requirements that, when added to the request for proposal (RFP) and scope of work (SOW), make good business sense. Placing overly complex pollution prevention requirements on contractors that are responding to programs with a limited scope or few environmental issues does not make good business sense.

The primary pollution prevention contractual language tool you can use is NATIONAL AEROSPACE STANDARD (NAS) 411 - "HAZARDOUS MATERIALS MANAGEMENT PROGRAM." NAS 411 (first published in July 1993 and revised in March 1994) has been accepted by the Army as an effective means of communicating pollution prevention requirements to contractors. Data from NAS may be obtained by use of Data Item Descriptions (DIDs): DI-MISC-81398 and DI-MISC-81397 or by using the procedures referenced in DA Pamphlet 70-3, Army Acquisition Procedures. A copy of NAS 411 has been provided for your use in Appendix G.

DoD's Preferred Pollution Prevention Contractual Tool



- Pollution Prevention Contractual Requirements Document -Already Endorsed by DoD.
- Already Accepted by Contractors.
- Easily tailored to address various size/complexity programs.

In lieu of, or sometimes in addition to NAS 411, there are other more Army-specific requirements that MATDEVs have found useful in developing contractor RFP/SOW requirements. The following is a brief list or synopsis of these requirement ideas. Again, these requirement ideas should be tailored, in a manner consistent with good business practices, to meet your program needs. As with NAS 411, you are encouraged to incorporate any ideas from the following list that may be useful to your program into the Phase I - Demonstration and Validation RFP and SOW.

Key Concepts that Could be Incorporated into Phase I - Demonstration and Validation RFP/SOW Contractual Requirements.

- Require continued integration of pollution prevention requirements into functional program documentation.

- Require development of the PEA and any additional tiers or supplements to the existing environmental documents. The tiers should reflect the increasing level of program technical detail.

- Require environmental and pollution prevention trade-off studies that examine the use of alternative, less-toxic materials or less-hazardous production processes (in accordance with either NAS 411 requirements or state/local policy guidelines). All trade-off analyses should address:

    - Production rates during peacetime and during surge/mobilization. Analyses should address how increased production rates affect environmental compliance.

    - Life-cycle costs of the various alternatives including the costs to handle, treat, and dispose of hazardous materials/wastes.

- Require the development of risk management analyses. Incorporate environmental and safety issues into all program reviews.

- Define the weight pollution prevention/environmental criteria will be given in the overall source selection process. The following are possible source selection criteria:

- Effectiveness of environmental risk analyses including material and process issues.

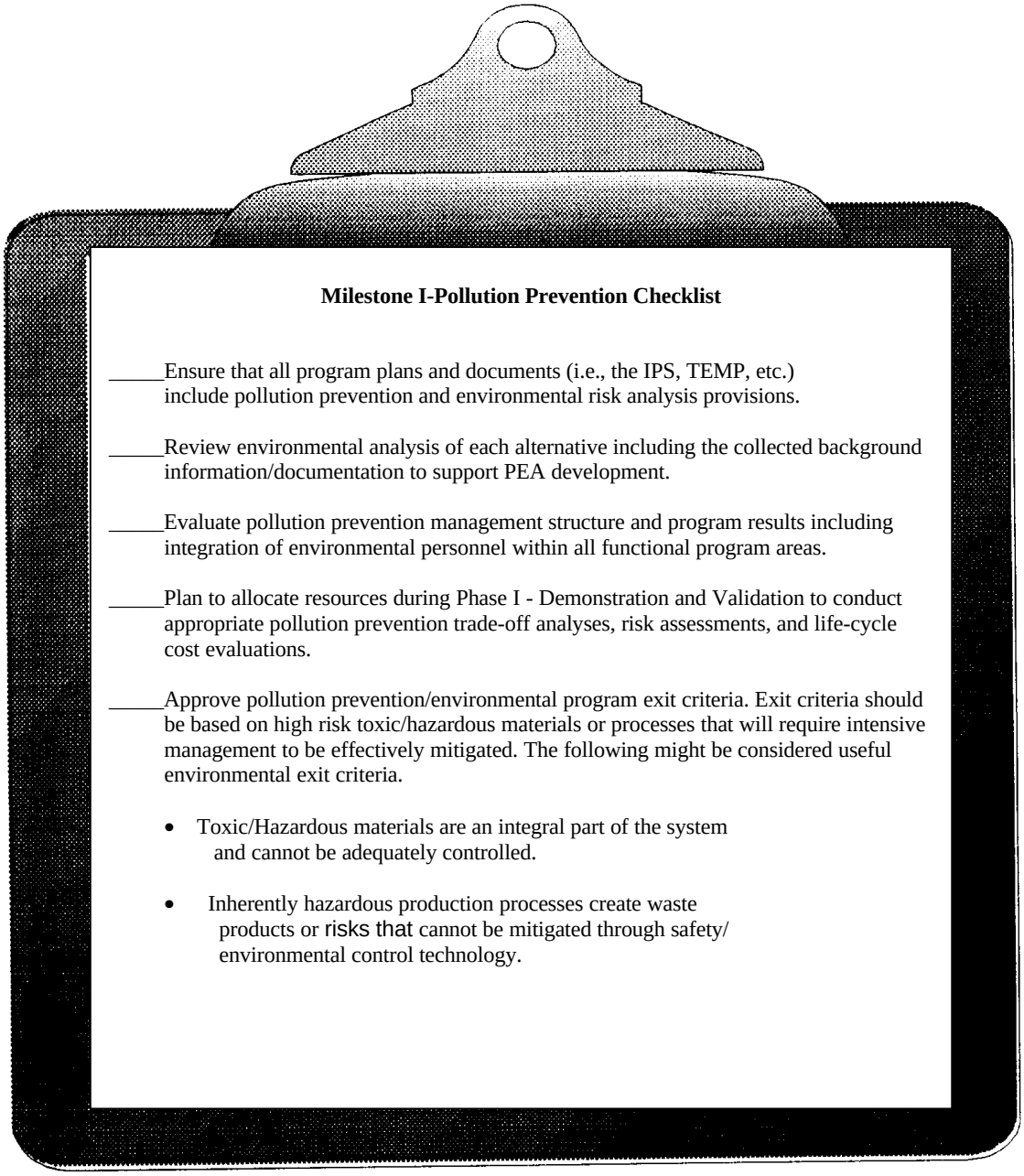
- Number and quality of trade-off analyses that will be considered.

- Adequacy of environmental and pollution prevention planning for subsequent phases to be incorporated across functional program activities.

After incorporating pollution prevention requirements into the Phase I -Demonstration and Validation RFP and SOW, you and your EMT staff will have an opportunity to evaluate the contractor's responses. Based on sound business practices, an appropriate number of personnel (preferably from your EMT) should be assigned to conduct the review. Contractors that effectively incorporate pollution prevention and source reduction in the program plans should be rated as more responsive than contractors that ignore the issue or emphasize pollution control technology.

Milestone I - Concept Demonstration Approval

Passing Milestone I represents the actual initiation of the acquisition program and the start of actual pollution prevention decision-making Given that the pollution prevention program you have been developing is tailored to satisfy your program requirements and reflects sound business practices, Milestone I represents the point at which the development of your program pollution prevention infrastructure should be completed. The following is a brief checklist of pollution prevention and environmental items that should be addressed by Milestone I.



Milestone I-Pollution Prevention Checklist

_____Ensure that all program plans and documents (i.e., the IPS, TEMP, etc.) include pollution prevention and environmental risk analysis provisions.

_____Review environmental analysis of each alternative including the collected background information/documentation to support PEA development.

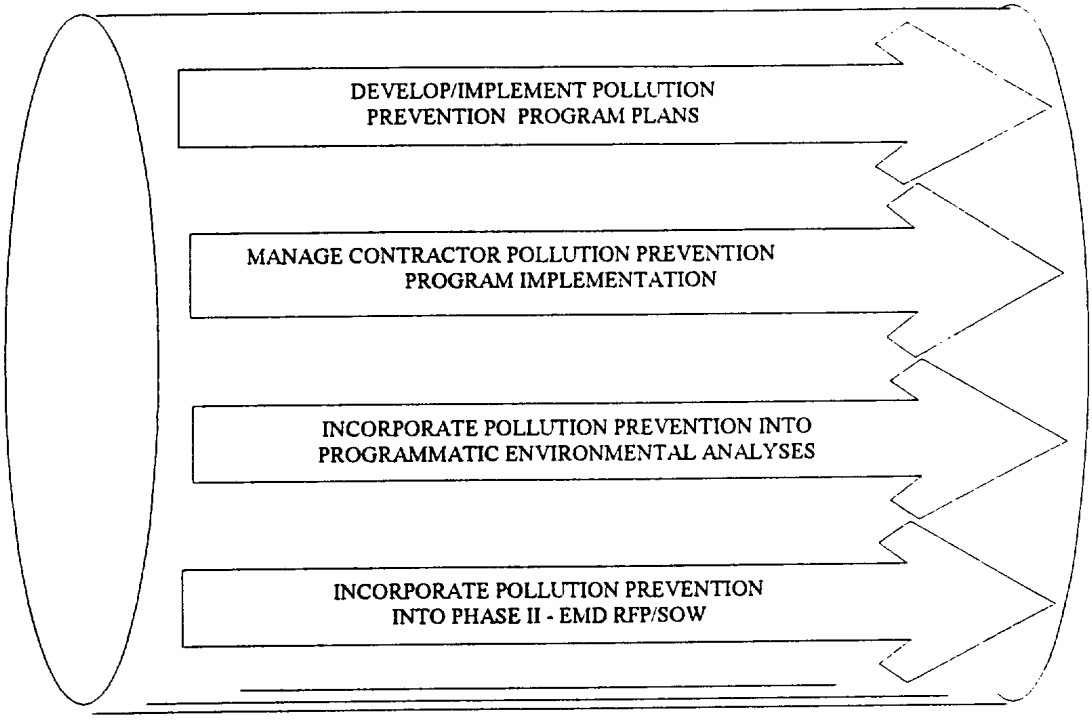
_____Evaluate pollution prevention management structure and program results including integration of environmental personnel within all functional program areas.

_____Plan to allocate resources during Phase I - Demonstration and Validation to conduct appropriate pollution prevention trade-off analyses, risk assessments, and life-cycle cost evaluations.

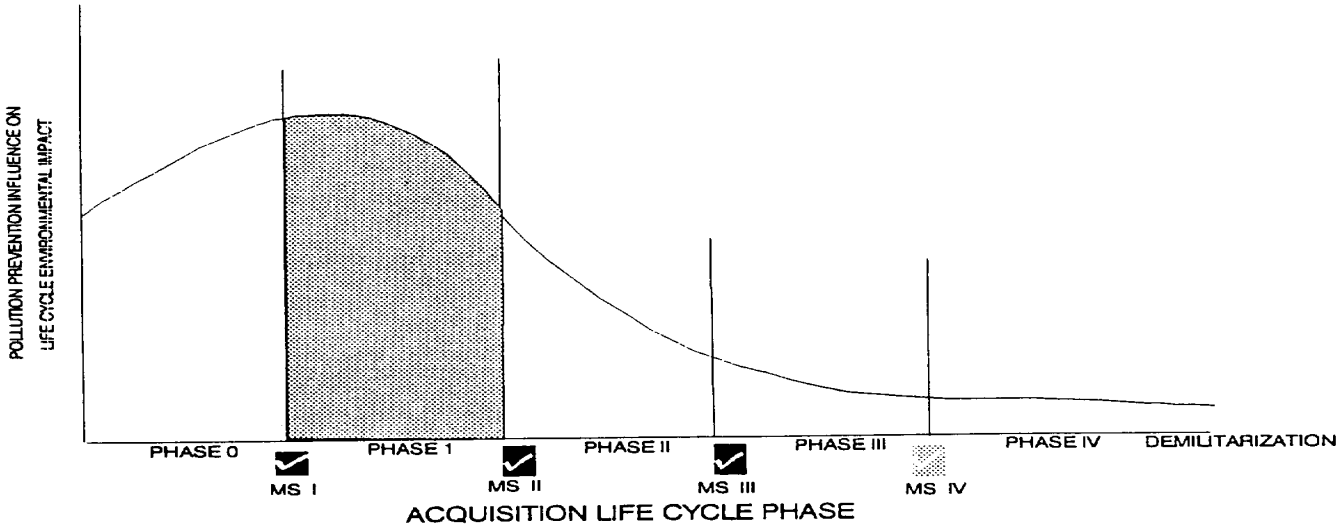
_____Approve pollution prevention/environmental program exit criteria. Exit criteria should be based on high risk toxic/hazardous materials or processes that will require intensive management to be effectively mitigated. The following might be considered useful environmental exit criteria.

- Toxic/Hazardous materials are an integral part of the system and cannot be adequately controlled.
- Inherently hazardous production processes create waste products or risks that cannot be mitigated through safety/ environmental control technology.

Phase I - Demonstration and Validation (D/V)



During Phase I - DN, you have the greatest opportunity to implement pollution prevention and reduce the life-cycle environmental impact of your system. The inherent flexibility in system design encountered during this early life-cycle phase allows you to make pollution prevention modifications that can be readily accommodated by compensating shifts in other design parameters. The following schematic diagram shows that Phase I - DN is your window of opportunity for pollution prevention decision-making



As shown above, the influence of your pollution prevention program on life-cycle environmental impact peaks at or near Milestone I. Before Milestone I (i.e., during Phase 0 - CED), the system designs are still not fixed and many of the details related to production processes/materials have not been defined. Because these issues are not defined during Phase 0 - CED, your pollution prevention decision-making opportunities are somewhat limited. After approximately Milestone III, (i.e., during Phases III and IV), your opportunities for pollution prevention are also effectively constrained by the mature system design. Thus, Phase I - DN represents your most significant window of opportunity to make decisions that will reduce system life-cycle environmental impact, costs, and risk factors.

The following discussion describes implementation of the four key Phase I - DN pollution prevention opportunities. The highlighted section of sentences throughout this discussion correspond with the key program task areas in the Phase I - DN pipeline schematic.

The **development and implementation of an effective pollution prevention program** represents a major opportunity to have a positive influence on life-cycle pollution prevention. Although this key task may appear to lack "specifics" or "details," it is important to remember that acquisition pollution prevention is an ongoing process that, if properly implemented, will provide you with a continuous stream of decision-making opportunities. Based on the assumption that you have already created an effective pollution prevention program, the following is a brief summary or synopsis of key pollution prevention program issues you can decide to incorporate into the Phase I -IDN program. Remember, acquisition pollution prevention efforts should be tailored to !/our individual program scope; and as such all of these issues may not be applicable to !/our specific program.

Key Phase I - D/V Pollution Prevention Concepts

- Require system risk analysis process to include pollution prevention considerations by classifying all toxic/hazardous materials and ODCs as risk factors.

- Require pollution prevention to appear as a listed component of the life-cycle cost estimate program.

- Require baseline operational/support concepts including; personnel, facility, production, and logistics analyses to include pollution prevention.

- Devote a specified portion of the program budget (in accordance with good business practices) to funding pollution prevention RDT&E and MS&T programs. Track the return on these investments.

- Require program exit criteria to include hazardous material considerations. Possible exit criteria might include:

    - Toxic/Hazardous materials or 0DCs required as part of the design that cannot be replaced or controlled.

    - Hazardous or 0DC-based production processes required as part of the design that cannot be replaced or controlled.

- Include pollution prevention in the development of a demilitarization plan.

Your next most significant opportunities to implement pollution prevention relate to **management of the contractor's pollution prevention program.** Because Phase I - DN activities will focus on developing all of the key operational/support baseline data for a system, the contractor's implementation of pollution prevention will largely control the system life-cycle environmental impact.

The following are some key pollution prevention program concepts that you could decide to include in your Phase I - DN contractor management program. Again, you are encouraged to tailor these concepts to specifically satisfy your individual program requirements.

Key Phase I - D/V Pollution Prevention Issues Related to Contractor Management

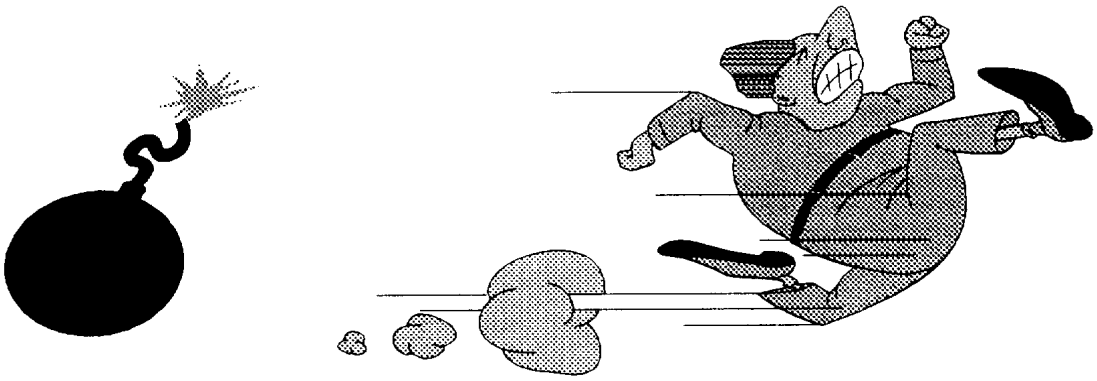
- Evaluate contractor's implementation of programs/plans developed in accordance with NAS 411 or state/local requirement guidelines.

- Evaluate contractor's implementation of formal pollution prevention/control plans and associated integration within systems engineering efforts.

- Review the development of documents related to risk and hazard analysis, life cycle cost analysis, etc. Ensure trade-off analyses and risks are being addressed in a manner that you feel is producing useful pollution prevention decision-making opportunities. Analyses should include life-cycle costs whenever possible.

- Review and update required acquisition documents (including the IPS, TEMP, other plans, reports, etc.). Additional documents generated during Phase I, such as the Technical Data Package Plan, Source Selection Plan, and the Configuration Management Program should also include pollution prevention considerations.

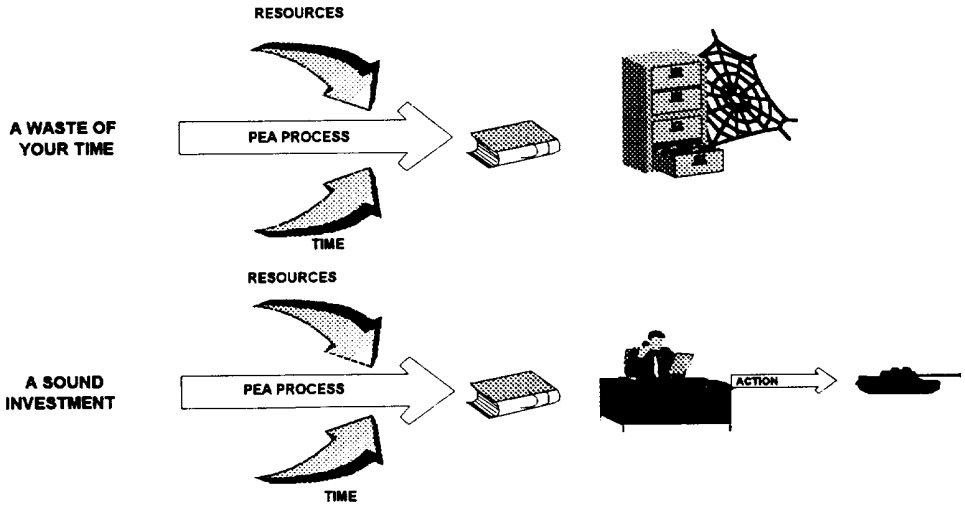
- Develop plans for implementing pollution prevention in subsequent program phases. If appropriate, demilitarization, disposition and/or disposal procedures should be documented to as great a degree as possible during Phase I - D/V. Guidelines for this planning process appear in the "Demilitarization" section of this guide.



I WISH WE HAD COME UP WITH A BETTER WAY TO DEMILITARIZE THESE THINGS DURING PHASE I - D/V

Additional Phase I - DN decision-making opportunities relate to **incorporation of pollution prevention planning into the development of the programmatic environmental analysis** (PEA). Development of the PEA should start directly after Milestone I (or may have started earlier) and will proceed in a tiered fashion throughout the program life cycle. The intent of the PEA is to stimulate the decision-making process regarding production, operations, and disposal of material in a manner that minimizes adverse impacts on the environment. The purpose of the PEA process is to generate decision-making opportunities, not to generate paper. Your acquisition pollution prevention program and the PEA are intimately related and should be complementary.

THE PEA IS ABOUT ACTION, NOT PAPER

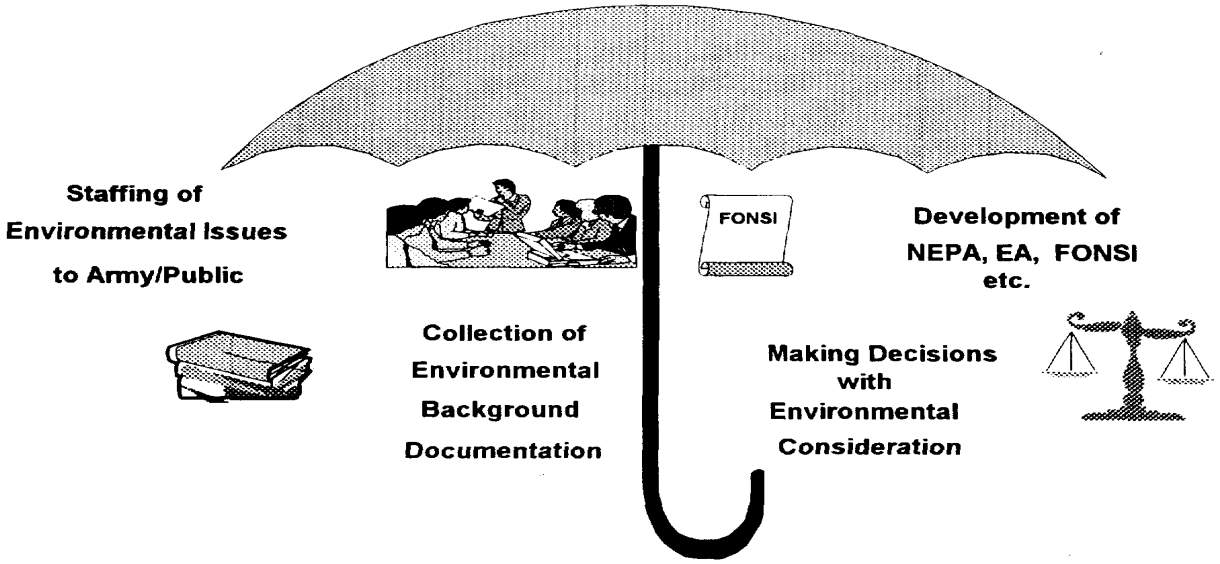


The PEA development process must be conducted in accordance with the NEPA, DoD, and Army requirements described in "What Are My Legal and Programmatic Pollution Prevention Requirements" (Chapter 2) of the guide. The

following are some key points that should be considered during the development of the PEA:

Programmatic Environmental Analysis (PEA) Guidance

- The PEA is an umbrella term for the ongoing program environmental analysis and decision-making process. The PEA will evolve with the total Program and encompass many key issues.



- The PEA is an environmental decision-making tool. The PEA should address trade-off analyses describing alternative processes, materials, or procedures that will reduce environmental impacts (resulting in reduced cost, schedule, and performance risks). Consideration should be given to those analyses that can easily evolve into NEPA documentation such as the Environmental Assessment (EA), and/or the Finding of No Significant Impact (FONSI), or the Environmental Impact Statement (ELS) and the Record of Decision (ROD). The requirements for these NEPA documents are described in 40 CFR, Part 1500 to end, and should be reviewed.

- The PEA is a process resulting in tiered analyses that will grow during subsequent life-cycle phases. A well developed PEA will form a solid foundation for program environmental development. All PEA tiers should emphasize decision-making and not simply represent a "ticket" to be "punched" or a document deliverable to be produced. By building on the

documentation collected in Phase 0 - CED, the Phase I - DN PEA will form the beginning of the program environmental audit trail.

- Analyses and other documents contained in the PEA should be staffed effectively through the Army matrix support structure and (as appropriate) released to the public. Army and public staffing comments are non-binding and should be viewed as suggestions that you or your EMT should consider for future action.

Another significant pollution prevention implementation opportunity you will encounter during Phase I - DN relates to the development of the Phase II - Engineering and Manufacturing Development (EMD) RFP/SOW requirements. Your efforts to **incorporate pollution prevention into the Phase II - EMD RFPISOW** will result in the already initiated pollution prevention program continuing to pay dividends. Many of the requirements that should be incorporated in the Phase II - EMD contract represent evolutionary developments of efforts initiated during earlier program phases. The following are issues that should be addressed in Phase II - EMD contract requirements:

Key Phase II -EMD Pollution Prevention RFP/SOW Issues

- Incorporate follow-on requirements for the NAS 411 Hazardous Materials Management program.
- Develop any additional, required tiers or supplements to the PEA, analyses and documents.
- Update requirements for pollution prevention/control plans and environmental integration with functional programs. Include requirements for pollution prevention to be integrated with system engineering requirements.
- Require formal reports that describe environmental analyses, management plans, and mitigation approaches. Include requirements for updates to functional program plans and the technical data package.
- Require the continuation of the environmental risk assessment programs. The risk assessment and management efforts should address life-cycle cost issues whenever applicable. In addition, risk analyses should address changes in production rates due to surge/mobilization.
- Define the pollution prevention and environmental performance criteria, and relative weighting factors, that will be used in the source selection process.

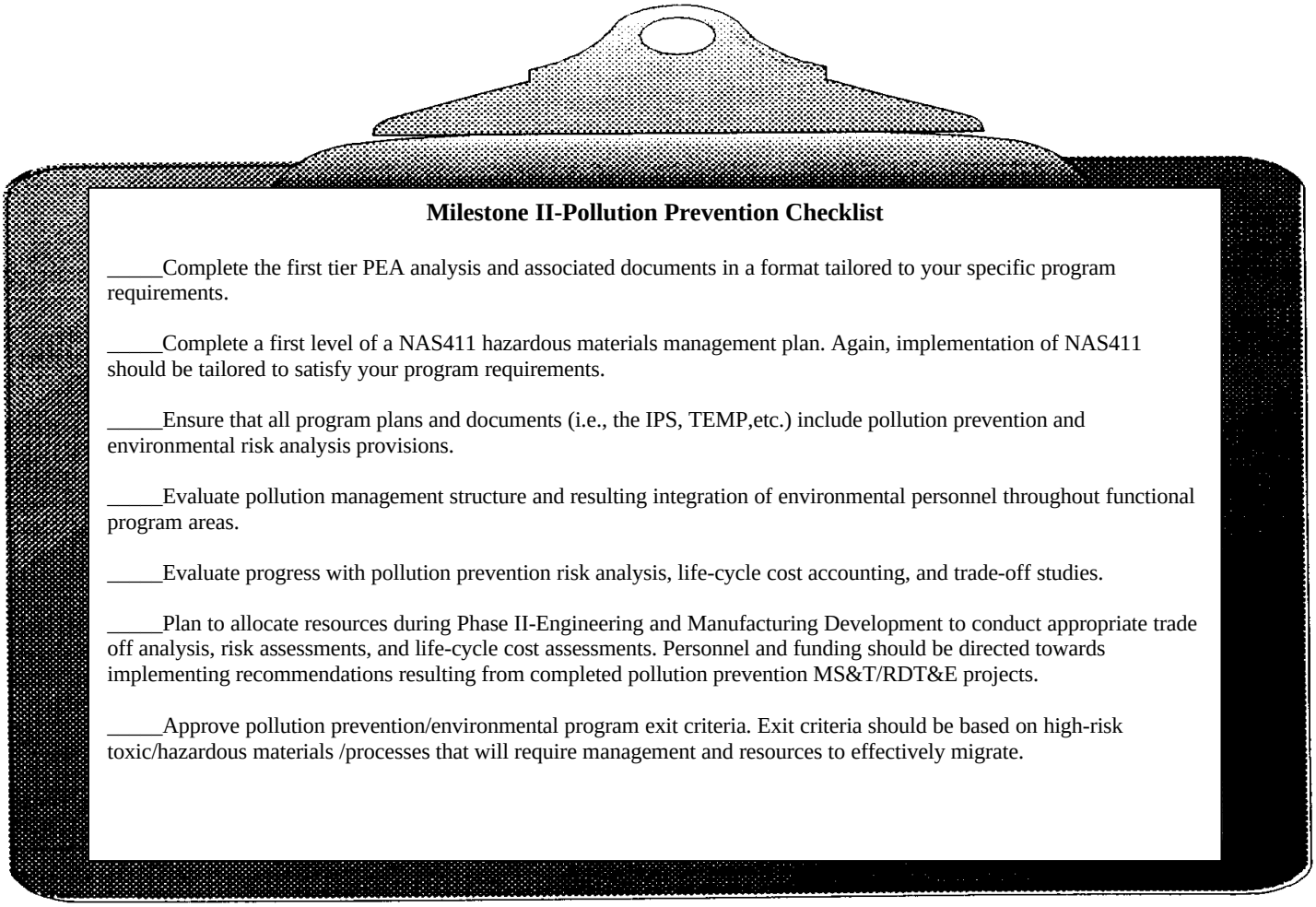
Possible performance criteria could include:

- Effectiveness of pollution prevention program implementation at the contractor and subcontractor level.
- Value added through trade-off studies and risk mitigation programs.
- Acceptability of facilities and training programs to handle hazardous materials/processes that cannot be designed out of the system.

After incorporating pollution prevention requirements into the Phase II -Engineering and Manufacturing Development RFP/SOW, the contractor's pollution prevention program responses must be evaluated. Other MATDEVs have found that assigning personnel with pollution prevention experience, preferably from your EMT, to review the contractor's responses will help ensure program success.

Milestone II- Development Approval

The bulk of the important Milestone II pollution prevention issues are evolutionary developments of tasks initiated during Phase I - DN. However, Milestone II does represent a point at which certain key tasks initiated during Phase I - DN should be completed. The following is a brief checklist of pollution prevention and environmental items that should be completed by Milestone II.



Milestone II-Pollution Prevention Checklist

_____Complete the first tier PEA analysis and associated documents in a format tailored to your specific program requirements.

_____Complete a first level of a NAS411 hazardous materials management plan. Again, implementation of NAS411 should be tailored to satisfy your program requirements.

_____Ensure that all program plans and documents (i.e., the IPS, TEMP,etc.) include pollution prevention and environmental risk analysis provisions.

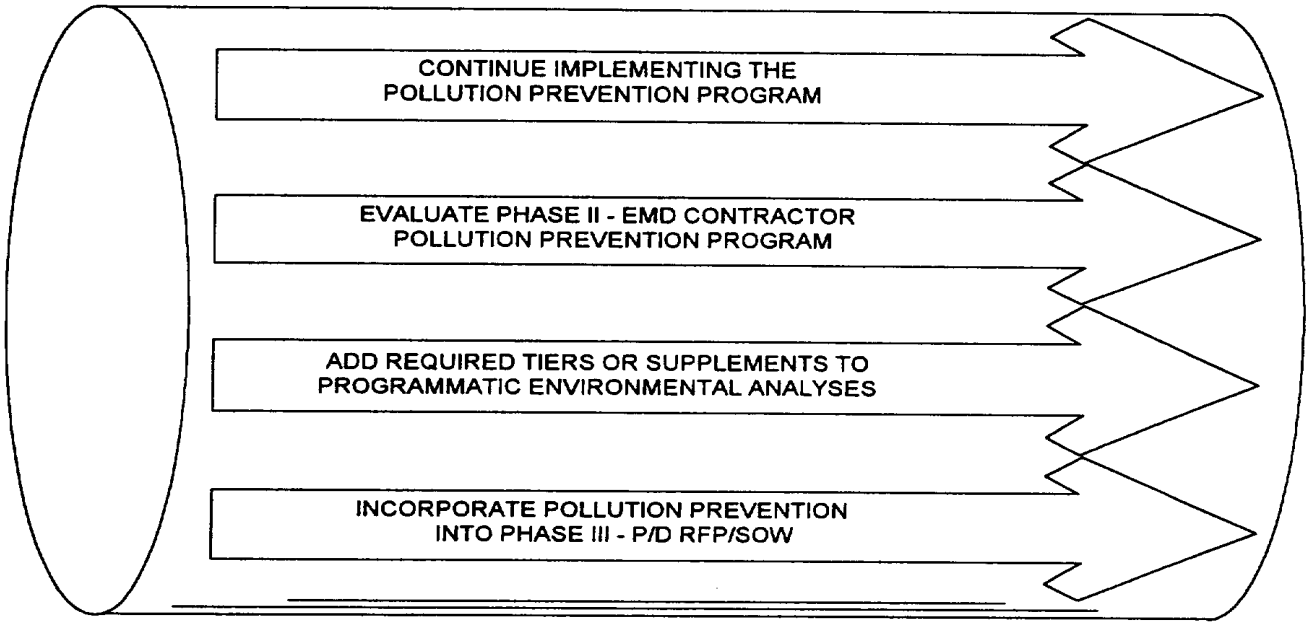
_____Evaluate pollution management structure and resulting integration of environmental personnel throughout functional program areas.

_____Evaluate progress with pollution prevention risk analysis, life-cycle cost accounting, and trade-off studies.

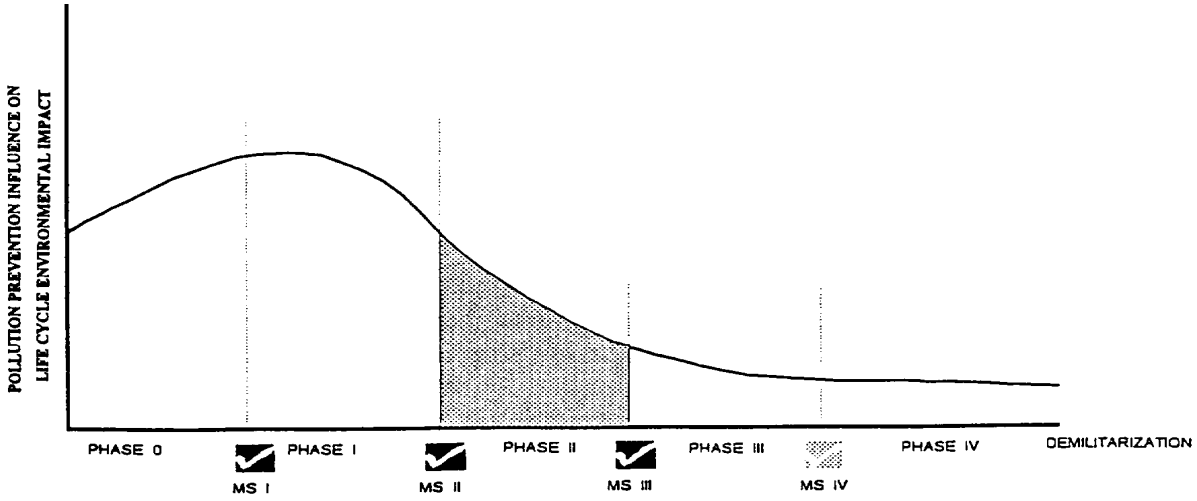
_____Plan to allocate resources during Phase II-Engineering and Manufacturing Development to conduct appropriate trade off analysis, risk assessments, and life-cycle cost assessments. Personnel and funding should be directed towards implementing recommendations resulting from completed pollution prevention MS&T/RDT&E projects.

_____Approve pollution prevention/environmental program exit criteria. Exit criteria should be based on high-risk toxic/hazardous materials /processes that will require management and resources to effectively migrate.

Phase II - Engineering and Manufacturing Development (EMD)



The increasing level of technical detail associated with implementing pollution prevention during Phase II - EMD will shift your decision-making process from design issues to the manufacturing shop floor. This shift in focus will create new opportunities for pollution prevention. However, because of the increasingly defined system design, these opportunities will be more constrained by performance issues. As such, your net ability to affect the overall system environmental impact will be less than in earlier lifecycle phases. The following schematic diagram shows this trend.



ACQUISITION LIFE CYCLE PHASE

Although the decisions you have an opportunity to make during Phase II - EMD are less likely to have a significant life cycle environmental impact than decisions made during Phase I - DN, you can still significantly reduce your costs and risks through ,effective pollution prevention program implementation. The primary decision-making opportunities you will encounter during Phase II - EMD relate to manufacturing processes, infrastructure, and procedures. Your decisions during this phase can still profoundly and positively affect the environment.

The most important decisions you can make during Phase II -EMD will relate to **continuation of your acquisition pollution prevention program.** Because system design is becoming more defined during Phase II - EMD, your decision-making opportunities will relate to production and manufacturing processes. Manufacturing issues can be technically complex and can require a considerable degree of process understanding to modify effectively. You can greatly improve your ability to make decisions regarding production-type issues by allocating additional EMT and matrix support staff to address specific technical tasks. Technical experts in appropriate production processes can work with your EMT to reduce hazardous materials use in the production process; eliminate unnecessary process steps that create environmental risks; and determine the most environmentally acceptable production processes. The coordinated efforts between these technical experts and your EMT can provide you with the guidance you need to make effective pollution prevention decisions.

Additional pollution prevention decision-making opportunities should evolve from any environmental MS&T/RDT&E programs that were funded during earlier life-cycle phases. You should review the results of these programs and decide to proceed with those efforts that produced an economic or risk reduction return for your program and terminate those MS&T/RDT&E programs that did not

Beyond these decision-making opportunities, you also have the chance to evaluate future program pollution prevention requirements and allocate resources accordingly. For example, you may identify some aspect of the system manufacturing process during Phase II - EMD that will cause a significant environmental problem during demilitarization. By identifying this potential demilitarization problem during Phase II -EMD, you have an opportunity to reallocate pollution prevention program resources to reduce the environmental impacts caused by demilitarization. These types of unplanned or opportunity-driven pollution prevention implementation decisions will become prevalent as the program progresses through the life cycle.

Evaluating the contractor's acquisition pollution prevention program is another ongoing Phase II - EMD task that creates numerous decision-making opportunities. The contractual pollution prevention requirements implemented during the earlier life-cycle phases will begin to result in measurable reductions in environmental impact during this phase. Most of the contract management requirements during this phase reflect evolutionary developments of the same tasks encountered during the earlier life-cycle phases. The following are key Phase II - EMD contractor pollution prevention

management issues that you can evaluate and tailor to meet your specific program needs.

Key Phase 11 - EMD Pollution Prevention Issues

- As appropriate, evaluate the contractor's execution of any NAS 411 hazardous materials management programs.

- As appropriate, develop additional tiers or supplements to the PEA.

- Continue incorporating pollution prevention/environmental issues into integrated program reviews and ensure that pollution prevention is implemented across all program functional areas. Pollution prevention should be incorporated into all life-cycle cost estimates (including design-to-cost, could cost, etc.). Pollution prevention analyses should address both normal and surge/mobilization production rates.

- The proposed process by which your system will be demilitarized should be considered and documented. Demilitarization plans should be defined and estimated costs for final disposal should be included in all life-cycle cost estimates. Guidelines for this planning process appear in the "Demilitarization" section of this guide.

- Ensure that the contractors incorporate pollution prevention requirements into subcontractor requirements. Contractors should ensure the pollution prevention program "flows down" to the subcontractor level.

- Continue integrating pollution prevention and environmental considerations into all program documents, plans, and reports. Pollution prevention should be incorporated into the IPS, TEMP, and the Integrated Logistics Support Plan (ILSP). Because of the increasing level of technical detail, many documents developed during this phase will address facility-specific issues such as disaster response/spill control plans, personal protective equipment use provisions, hazardous waste disposal procedures, and permits. All item-specific technical manuals, orders, training documents, and other instructional materials should include appropriate environmental/pollution prevention guidance.

- Ensure that procedures are developed for the hazardous material authorized use list to be reviewed. This review must be coordinated with the supporting commodity command and the Defense Logistics Agency.

- Generate a final summary of all hazardous materials that have not been engineered out of the system. Ensure that system production and fielding can be conducted in a manner that complies with Federal, state, and local laws.

- Obtain appropriate acquisition approvals for any high-risk hazardous materials that have not been eliminated from the system.

- Ensure that the Technical Data Package includes pollution prevention and environmental considerations.

Another set of Phase II - EMD decision-making opportunities relate to the **development of additional tiers or supplements to the PEA**. Based on the scope and complexity of your program, you may or may not require a PEA analysis tier during Phase II - EMD. Assuming another PEA tier is required, the analysis and resulting document/supplement should be focused on the production processes and projected life-cycle environmental impact. Again,. development of these tiered PEA analyses should relate closely to pollution prevention program implementation.

Incorporating pollution prevention into the Phase III - Production and Deployment (P/D) RFP and SOW is another significant Phase II - EMD decision-making opportunity. The focus of Phase III - Production and Deployment pollution prevention planning should be to get the ideas/plans developed during the earlier lifecycle phases onto the shop floor and into the field units. The following are a few issues that could be incorporated into a Phase III - P/D RFP/SOW.

Key Phase III - Production and Deployment Pollution Prevention RFP/SOW Issues

- Require a final pollution prevention/control program plan and schedule. The schedule should include specific pollution prevention/environmental criteria that will be used by the source selection panel. You should also discuss the weighting factors associated with pollution prevention. Possible criteria could include:

    - Appropriate consideration must be given to post-production environmental management and support plans. Any hazardous/toxic pollution prevention/control plan deficiencies should be reviewed and modified to mitigate the potential impacts.

    - Appropriate consideration must be given to a methodology for implementing pollution prevention opportunities based on production and deployment experience.

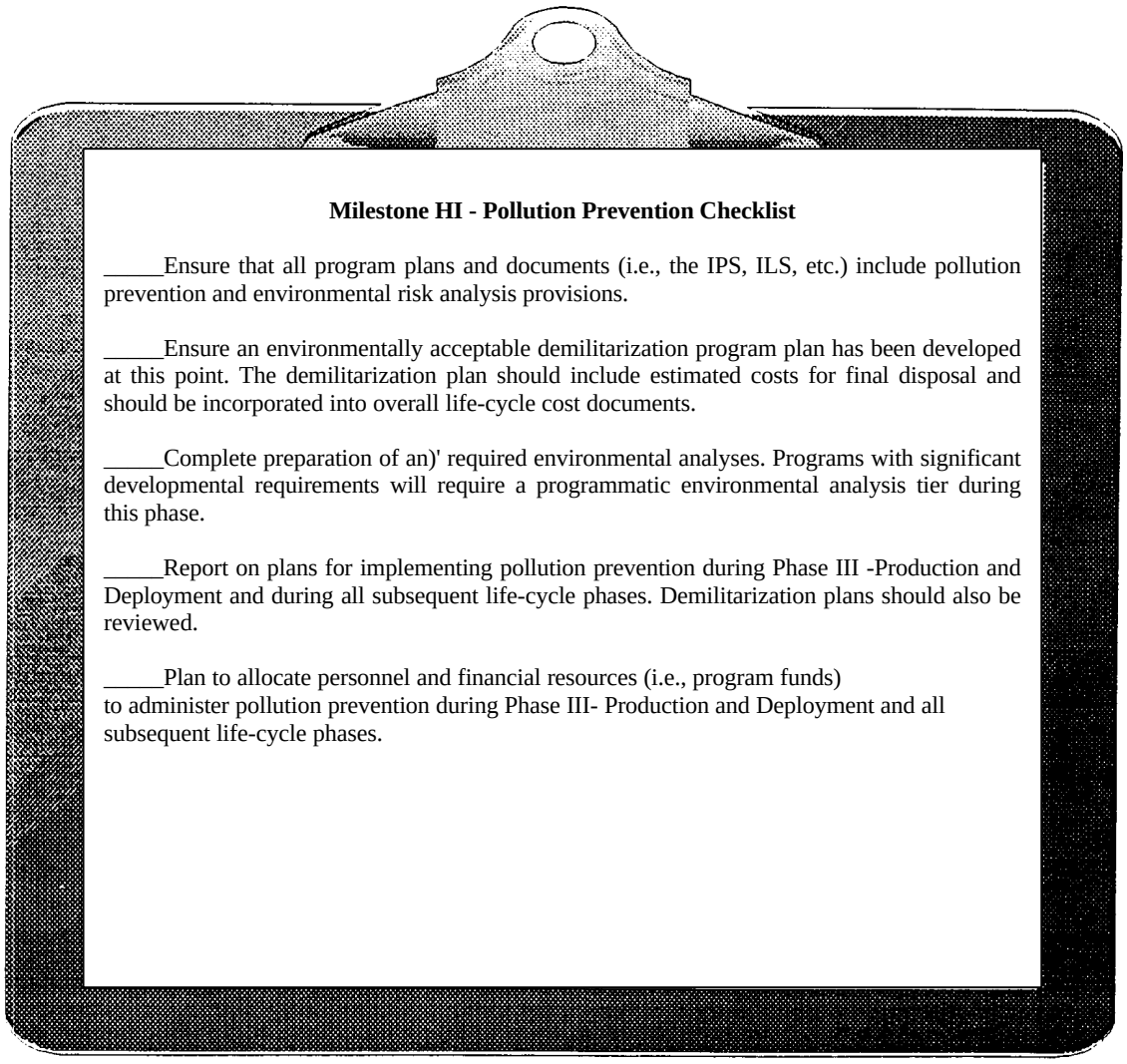
- Require pollution prevention to be incorporated into all required program plans, strategies, and reports including those related to life-cycle costs.

After the pollution prevention requirements are incorporated into the Phase III -P/D RFP/SOW, you can allocate an appropriate staff level to support evaluation of the Phase III - Production and Deployment proposals. Based on the scope and complexity of your program, you can decide on an appropriate level of personnel support for the evaluation process. Again, assigning staff from the EMT to evaluate the proposals can help ensure pollution prevention is considered. Because the pollution prevention opportunities arising during Phase III - Production and Deployment will tend to relate to process changes and modifications, proposals describing an effective means of

exploiting these opportunities should be rated more highly than proposals describing an inflexible or fixed process.

Milestone III - Production Approval

Milestone III requirements are based on the implementation of pollution prevention program concepts developed during the previous phases. By Milestone III, virtually all of your system-oriented pollution prevention planning should be complete. The following is a brief checklist of pollution prevention and environmental issues that should have been addressed by this point in the life cycle.



Milestone HI - Pollution Prevention Checklist

_____Ensure that all program plans and documents (i.e., the IPS, ILS, etc.) include pollution prevention and environmental risk analysis provisions.

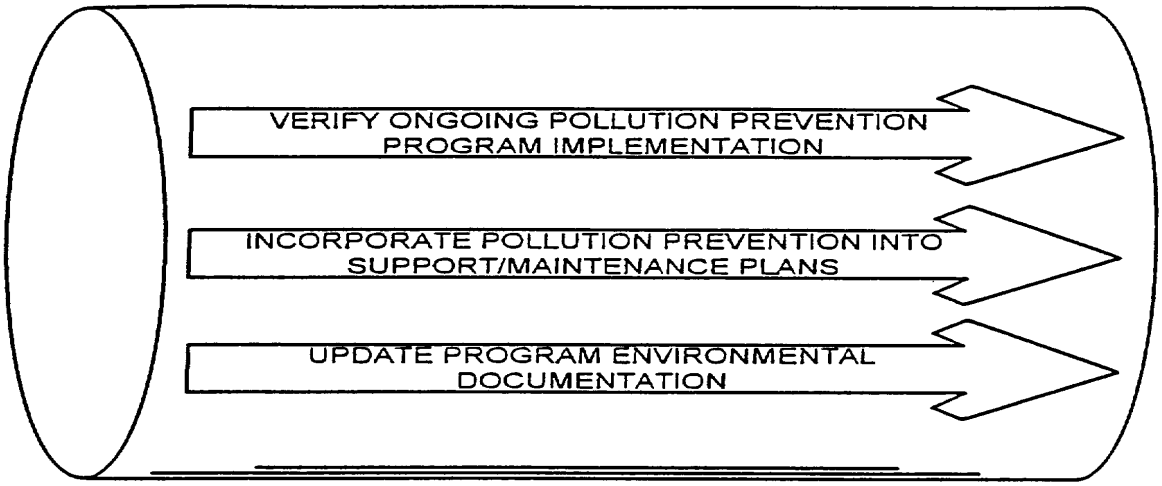
_____Ensure an environmentally acceptable demilitarization program plan has been developed at this point. The demilitarization plan should include estimated costs for final disposal and should be incorporated into overall life-cycle cost documents.

_____Complete preparation of an)' required environmental analyses. Programs with significant developmental requirements will require a programmatic environmental analysis tier during this phase.

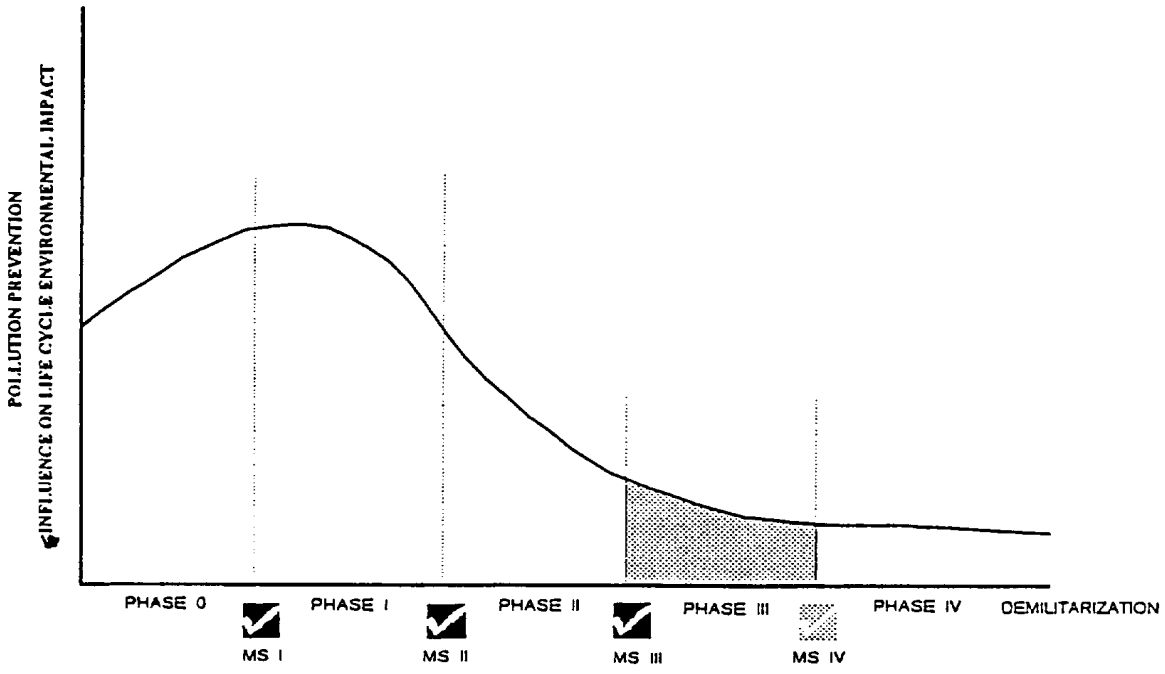
_____Report on plans for implementing pollution prevention during Phase III -Production and Deployment and during all subsequent life-cycle phases. Demilitarization plans should also be reviewed.

_____Plan to allocate personnel and financial resources (i.e., program funds) to administer pollution prevention during Phase III- Production and Deployment and all subsequent life-cycle phases.

Phase III - Production and Deployment (P/D)



Your Phase III - P/D pollution prevention decision-making opportunities are somewhat limited by the maturity of the program. With systems rolling off the production line and being provided to field units, your ability to make pollution prevention decisions is limited. As shown below in the schematic diagram, the vast majority of your pollution prevention planning should have been completed by the time the program enters Phase III - P/D.



ACQUISITION LIFE CYCLE PHASE

Although the schematic diagram shown above suggests that pollution prevention decision-making opportunities are limited during Phase III - P/D, it is important to note that you can still make decisions during this phase that will reduce system life-cycle environmental impacts. Your opportunities to make pollution prevention decisions during Phase III - P/D will relate primarily to reduced uses for hazardous materials during production. Any decision you can make to reduce the uses for hazardous materials in your system can still result in reduced life-cycle environmental impacts, risks, and costs.

Because of the mature program, many of your Phase III - P/D decision-making opportunities will relate to **verifying that the contractor is effectively implementing ongoing pollution prevention programs.** The contractor producing your system will have developed and submitted pollution prevention plans during the earlier life-cycle phases. The implementation of these plans at this point in the life cycle should result in reduced environmental impacts and costs. In addition to implementing these fixed plans, your contractor must be opportunistic in his pollution prevention implementation. Even the most well thought-out pollution prevention plan cannot cover every contingency that may occur on the production shop floor. Your contractors should be able to identify shop-floor-level pollution prevention opportunities and present these to you or your EMT for analysis. The following lists pollution prevention opportunities that other MATDEVs have encountered during Phase III - P/D operations

Phase III - P/D Pollution Prevention Opportunities

- Improve production facility "housekeeping" to prevention pollution. Housekeeping improvements can include completely draining liquid-bearing drums before disposal, preventing fuel/lubricant spills during testing, and reusing cleaning solutions in less-critical applications. Studies at refineries and chemical production plants have shown that simple housekeeping improvements can eliminate waste streams and significantly reduce operating costs.

- Utilize time-sensitive materials effectively. Materials such as paints and sealants that cure rapidly after being mixed can become waste if not completely used during a given work period. For example, a major defense contractor eliminated a waste stream and cut costs by simply purchasing time-sensitive materials in smaller containers that could be totally consumed during one shift.

- Evaluate applicability of pollution prevention technologies that may have evolved during the system life cycle. These technologies may include new materials or processes that could replace more hazardous technologies currently in use. For example, a major defense contractor completely eliminated an entire category of regulated paint solvent emissions by adopting a new painting technology that did not exist during the system's Phase I - D/V development process.

Any decisions you have an opportunity to make related to the types of issues listed above can reduce system life-cycle environmental impact. Other MATDEVs have found that successful Phase III - P/D pollution prevention implementation is controlled by contractor motivation. Motivating the contractor to pursue pollution prevention **can** be an involved contractual process or can be the result of simple actions such as allowing the contractor to retain some amount of the savings from improved housekeeping. The contractor is your key to a successful Phase III - P/D pollution prevention program.

The Defense Logistics Agency (DLA), in their Regulation DLAR 4210.4, "Comprehensive Materials Management Program - Hazardous Materials Management Program," has acknowledged the need for manufacturing phase pollution prevention programs. Many of the techniques described in DLAR 4210.4 may be considered related to the issues described above. DLAR 4210.4 specifically states that improvements in feedstock purity, housekeeping, management, machinery efficiency, and recycling efforts could be used during the manufacturing phase to reduce hazardous waste generation.

Although the contractor has the greatest influence over the Phase III - P/D pollution prevention implementation opportunities, decisions you make regarding the **incorporating of pollution prevention into remaining logistics and support plans** can also have a major positive impact on the environment. Production and logistics plans should be updated to incorporate appropriate pollution prevention requirements. Documentation related to fielding should include the latest pollution prevention/environmental guidance before an item is released to the troops.

The issue of field pollution prevention program implementation is complicated by the division of authority controlling the actions you can take and actions operational unit commanders take when using your equipment. You cannot control how your system is handled in a field setting and the resulting environmental impacts. However, you can generate technical manuals, data packages, and maintenance procedures that incorporate pollution prevention concepts. These technical documents will then follow your system throughout the remainder of its life cycle and help to reduce life-cycle environmental impacts. The following lists some key concepts you can apply to developing technical documentation packages that will promote life cycle pollution prevention:

Key Pollution Prevention Concepts that can be Applied to the Development of Technical Documentation

- Avoid specifying the use of toxic/hazardous materials or ODCs in technical documentation. Provide as much specification flexibility as possible to allow new, environmentally acceptable processes to be implemented on an as-needed basis. For example, you could specify an aqueous cleaning process instead of specifying a 1, l, 1 -trichloroethane vapor degreasing process.

- Avoid specifying production processes; focus instead on specifying performance requirements. For example, if a proposed technical document requires the use of a vapor degreaser (i.e., a heated vat filled with hazardous solvent used to clean parts), you can implement pollution prevention by deciding to eliminate the process reference and only describe the required final cleanliness level. By simply specifying a cleanliness level, you allow user activities the freedom to implement pollution prevention in their selection of the most environmentally acceptable cleaning systems.

- Carefully review proposed maintenance/operational practices for toxic/hazardous materials uses that do not provide a performance pay-back. For example, requiring a specific item to be cleaned after every step in a maintenance process may not result in improved performance relative to an item that is cleaned only once before it is reassembled.

The final area of pollution prevention decision-making you are likely to encounter during Phase III - P/D is the development of updated environmental documentation. Again the key issue associated with tier development is the scope of your program and the relative environmental risk factors. Some MATDEVs have found that Phase III - P/D tiered or supplemental environmental analyses are required, while others have found that development of such documents is redundant relative to already completed contractor or government analyses. Depending on how you have established and tailored your acquisition pollution prevention program, you may or may not decide to generate those documents. It is recommended that you consult with your EMT, matrix support legal staff, and MSC environmental personnel before making a final environmental analysis decision.

Milestone IV - Major Modification Approval

The acquisition process becomes a bit nebulous at this last milestone. At this point, your responsibilities as a MATDEV have essentially been completed and the decision to conduct major modifications may or may not follow the current acquisition cycle. For example, a major modification to a main battle tank might result in a separate program shifting back to Phase II - EMD, instead of proceeding through Milestone IV. Based on the fact that some major system modifications are performed after a Milestone IV, the following discussion highlights just a few key pollution prevention concepts that could affect your decision-making. The following are some possible Milestone IV pollution prevention considerations.

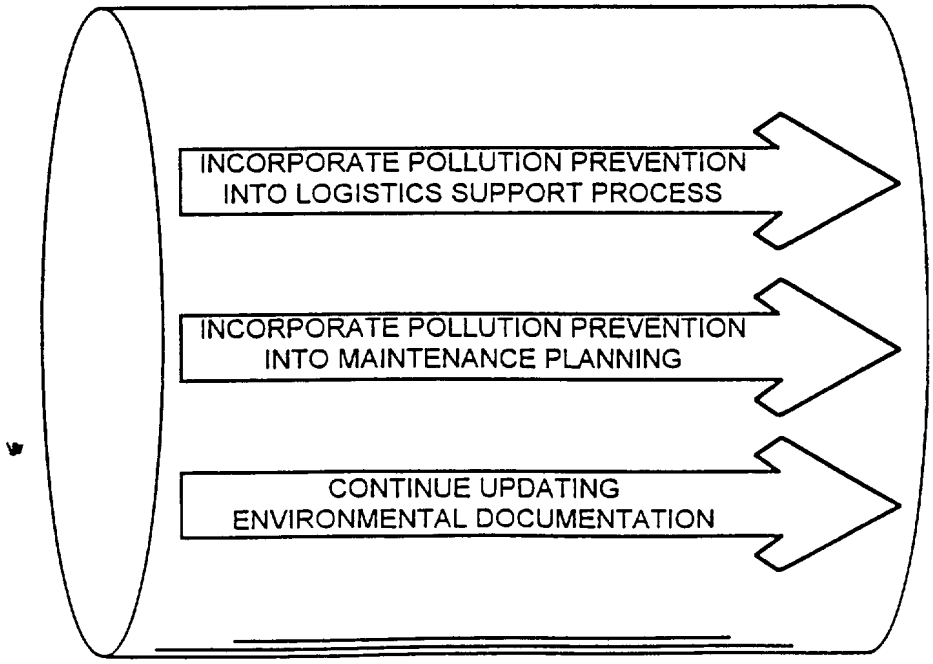
Milestone IV-Pollution Prevention Checklist

_____ Ensure that any additional or new program plans include pollution prevention and environmental risk analysis provisions.

_____ Complete preparation of any additional environmental analysis or supplements that would be included in the EPA. Programs with significant development requirements will require a programmatic environmental analysis tier or supplement during this phase.

Milestone IV pollution prevention requirements vary significantly depending on the proposed modification and are difficult to define relative to your position as the program MATDEV. Modifications that generally require significant changes in hardware or system configuration will require pollution prevention implementation. Challenges that relate to software or ancillary system interfaces generally will not require extensive pollution prevention planning.

Phase IV - Operations and Support (O/S)



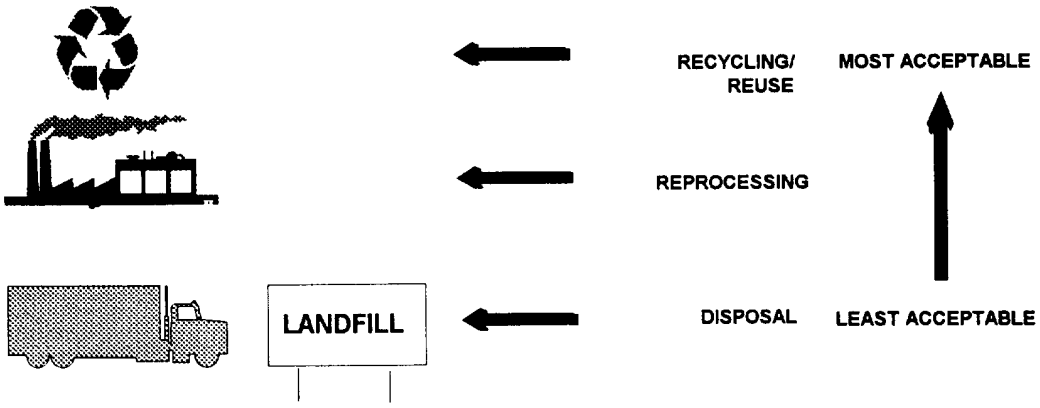
Although Phase IV - O/S is listed as a life-cycle phase in DoDI 5000.2, "Defense Acquisition Management Policies and Procedures," you are unlikely to have any real influence on pollution prevention activities during this life-cycle phase. All opportunities for pollution prevention implementation during this phase would result from support activities implementing the kinds of "housekeeping-type" programs described in the Phase III - P/D discussion.

Demilitarization

Although demilitarization is not specifically listed in DoDI 5000.2, "Defense Acquisition Management Policies and Procedures," as a life-cycle phase, decisions you make during the acquisition process will control the environmental impact of demilitarization or disposal procedures. As has been demonstrated by current chemical munitions demilitarization programs, the environmental issues associated with demilitarization/disposal of your system can be more significant than those created during all previous life-cycle phases. Effective planning during the Phases I & II can minimize hazardous waste generation during demilitarization. As was the case throughout the life-cycle discussion, all demilitarization planning should reflect good business practices. You are encouraged to select a demilitarization approach that minimizes your program costs while simultaneously creating as few adverse environmental impacts as possible.

The purpose of this discussion is to provide you with information about preferred demilitarization approaches that you can use to make effective acquisition decisions. Hopefully, you are just initiating an acquisition program and as such will have many opportunities to plan for environmentally acceptable system demilitarization. If you are dealing with an already fielded system, your demilitarization decision-making options may be limited. The overall concept associated with system demilitarization planning is that some disposal techniques are preferred because they create fewer environmental impacts than other processes. The following describes the hierarchy of preferred demilitarization techniques.

Demilitarization Approaches



Recycling or complete reuse is the preferred system disposal or demilitarization process. Incorporating recycling into the demilitarization/disposal plan is simple, provided the system is amenable to disassembly. The decisions you make regarding design features that will ease disassembly of your system into component parts of relatively uniform material composition will control whether or not recycling is a viable disposal process. For example, the automobile industry has recently developed a program that codes individual vehicle parts by material of construction to allow recycling. You could elect to develop a similar program for your materiel. Although adding design features that will ease recycling increases production costs, your overall system life-cycle costs will be lower because scrap vendors will, in many cases, pay the government for the separated materials.

If your system is not amenable to direct recycling, then the next most preferred demilitarization method is **reprocessing**. Reprocessing involves the use of your materiel in a manner different than that for which it was originally intended. Examples of reprocessing include the burning of explosives as fuels or the use of ground-up scrap tires in asphalt blends. In some cases, simple design or operational changes that you can make during the early phases of your system life cycle can "make or break" a reprocessing program. For example, many Army activities currently reprocess petroleum products as fuels. However, there are severe limitations on the use of petroleum products that are contaminated with solvents as fuels. You could decide to develop system maintenance manuals that minimize the risk of mixing petroleum products with solvents to allow easy reprocessing. As was the case with the recycling example, any investments of this type that you can make during the early acquisition phases will result in lower life-cycle costs.

As a caution, some MATDEVs have found that proposing to reprocess materials can result in public concerns about the environment. As such, any reprocessing disposal plan should describe specific procedures and include an environmental analysis. A specific PEA or system PEA analysis document tier should be completed before considering reprocessing as a demilitarization procedure.

The final, and least preferred, demilitarization approach is to pay for **disposal of your system in a landfill**. Although the nature of your system may leave you with no other options, you should explore recycling and reuse before deciding to use any waste disposal procedure. Any disposal-based demilitarization plan must be accounted for in life-cycle cost analyses. Life-cycle costs will be significantly higher for demilitarization plans based on disposal in a landfill than for those based on recycling or reprocessing. As was the case for reprocessing, disposing of military equipment in a landfill can cause public concerns. Thus, you should require an environmental analysis tier or supplement to the PEA tier addressing landfill disposal before incorporating this process into your demilitarization plan.

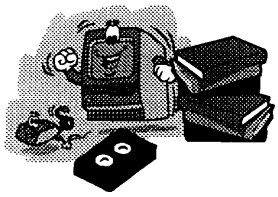
4 WHERE CAN I GO FOR ASSISTANCE?

Throughout this second edition guide, acquisition pollution prevention requirements, ideas, and suggestions have been presented. Many of these pollution prevention issues relate to an environmental decision-making process that may be completely new to you and to your staff. As such, you may be feeling overwhelmed by the, overall pollution prevention program concept and wondering where you can turn for assistance.

The purpose of this chapter is to provide you with a brief summary of the organizations and activities that have already been established to assist the acquisition community with pollution prevention. As was the case in the training discussion presented in Chapter 3, "How Do I Develop and Manage an Acquisition Pollution Prevention Program," a distinction can be drawn between those agencies that can offer you assistance and those that would more appropriately deal with your staff (i.e., EMT or environmental coordinator). Although the following section discusses all sources of assistance, the activities most able to assist you are presented first. The activities that are most able to assist your staff are discussed in the second part of this chapter and to a greater degree in the appendices.

Direct MATDEV Pollution Prevention Support Activities

Program: Army Acquisition Pollution Prevention Support Office



POC/Location: Headquarters - Army Materiel Command
ATTN: AMCRD-E/SARD-ZCS-E
5001 Eisenhower Avenue
Alexandria, VA 22333-0001
Comm: (703)274-0815/9488
DSN: 284-0815/9488

Services: The Army Acquisition Pollution Prevention Support Office (AAPPSO) is the primary resource for acquisition pollution prevention in the U.S. Army. The AAPPSO staff includes both technical and programmatic support personnel. AAPPSO provides technical assistance with various pollution prevention development and implementation programs. AAPPSO staff can directly answer many of your questions and also maintains contacts with many other support activities. In many cases, these other activities can assist you with your acquisition pollution prevention program.

Program: U.S. Army Logistics Management College (ALMC)

POC/Location: U.S. Army Logistics Management College
ATTN: APSZ-LSE (Mr. Steve Grisham)
Fort Lee, VA 23801-6050
Comm: (804) 765-473114806
DSN: 539-473114806

Services: The U.S. Army Logistics Management College offers pollution prevention training courses at Fort Lee, VA. In addition, the college can present pollution prevention training courses, tailored to your needs, at your site. The pollution prevention training courses include topics such as EMT management, life-cycle environmental considerations, ozone-depleting substances, toxicology, and other environmental decision-making areas.

The following agencies can assist your Environmental Management Team (EMT) and support staff with various aspects of your acquisition pollution prevention program. In addition, Appendix B contains lists of state agencies that may be able to answer pollution prevention questions and Appendix E may be referenced for U.S. Army pollution prevention and environmental management resources.

MATDEV Staff Pollution Prevention Support Activities

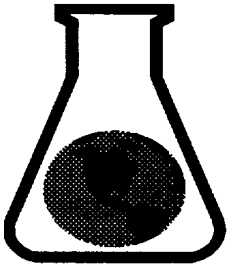
Program: Environmental Response Line

POC/Location: U.S. Army Environmental Center
Environmental Compliance Division
ATTN: SFIM-AEC-ACA
Aberdeen Proving Ground, MD
21010-5401
Comm: (800) USA-3845

Services: The Environmental Response Line provides toll-free telephone access to the most up-to-date information available on environmental regulations, policies, and laws from the U.S. Army, the Federal government, and other Armed Forces. Other areas of assistance include pollution prevention, compliance, restoration, and conservation. The service is available to the Army community worldwide. The line is staffed from 8 a.m. to 4:30 p.m. Eastern Standard Time on all Federal business days and messages can be left on the answering service at all other times.

Program: U.S. Army Environmental Hygiene Agency/Center for Health Promotion and Preventative Medicine

POC/Location: Mr. Joe Macko
U.S. Army Environmental Hygiene Agency(AEHA)/
U.S. Army Center for Health Promotion
and Preventative Medicine (CHPPM)
(Provisional)
Aberdeen Proving Ground, MD 21010
Comm: (703) 274-0816/5964
DSN: 284-0816/5964



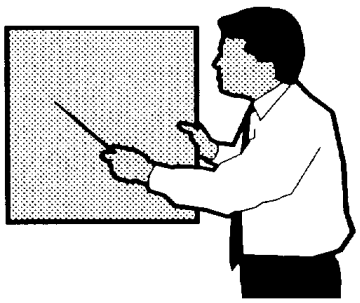
Services:

AEHA/CHPPM is nationally recognized as the center of occupational and environmental health excellence for the U.S. Army. They provide technical information and consulting services for occupational and environmental health of the military and civilian Army employees. Although AEHA became part of the CHPPM in August 1994, no major mission changes are anticipated.

The Toxicology Division of AEHA/CHPPM supports the Army Preventive Medicine Program through review, consultation, and testing services. Technical assessments are made of the hazards associated with the use of current and proposed military and industrial chemical formulations. The Toxicology Division provides the guidance and training required to employ military and industrial chemical formulations in a safe and effective manner.

Program: U.S. Army Engineering and Housing Support Center (USAHSC)

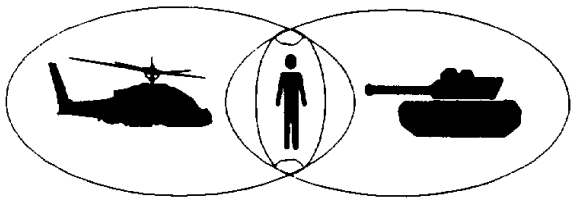
POC/Location: U.S Army Center for Public Works
(USACPW)
ATTN: CECPW-ES (Mr. Tom Spoerner)
7701 Telegraph Rd.
Alexandria, VA 22315
Comm: (703) 806-5211
DSN: 656-5211



Services: The U.S. Army Engineering and Housing Support Center can offer pollution prevention support to your EMT. Technical consulting, management support, and pollution prevention training are offered in the following areas: waste and energy conservation, recycling, radon evaluations, wastewater treatment, lead paint abatement, and pollution source reduction.

Program: U.S. Army Safety Center (USASC)

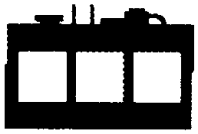
POC/Location: U.S. Army Safety Center
ATTN: CSSC PP
BLDG 4905 5th AV 1209
Fort Rucker AL 36362-5363
Comm: (205) 255-3261
DSN: 558-3261



Services: The U.S. Army Safety Center is the Army's Field Operating Agency for all safety matters. It can offer assistance in areas of pollution prevention that may impact on any aspect of safety.

Program: National Defense Center for Environmental Excellence (NDCEE)

POC/:Location: Ms. Sandra Sowerbrower
Concurrent Technologies Corporation
1450 Scalp Ave.
Johnstown, PA 15904
Comm: (814) 269-2809



Services: The NDCEE has recently developed an Environmental Information Network (EIN), Pilot Program. The Pilot Program asks points of contact at participating facilities to identify and prioritize pollution prevention issues, thereby setting an agenda for future NDCEE work efforts. As a direct result of the efforts of the Pilot Program participants, NDCEE staff is now producing and disseminating Standard Regulatory and Technology Informational Products to military/industrial facilities throughout the country.

5 FINAL THOUGHTS REGARDING ACQUISITION POLLUTION PREVENTION

You are the most important factor in determining the success or failure of your acquisition pollution prevention program. Decisions you make during every acquisition program phase will control the life cycle environmental impact of your system. Your opportunities for pollution prevention decision-making are intertwined with the overall acquisition process and will affect system design, procurement, operations, maintenance, and demilitarization.

Since the first edition of this guide was published in 1992, pollution prevention has been emphasized as the preferred environmental management approach at all levels of government. The Federal Pollution Prevention Act of 1990 has been followed by 29 state pollution prevention/source reduction laws. Executive Orders, DoD policies, and Army regulations have all stated the need to effectively implement pollution prevention programs. Your management challenge is to effectively implement pollution prevention with the limited program funding currently available. Fortunately, acquisition pollution prevention programs represent good business practices and as such should help you stretch your available funding to procure the highest quality materiel possible.

This second edition of the "Materiel Developer's Guide for Pollution Prevention" is intended to provide you with an understanding of the program goals and detailed process implementation discussions. The guide is arranged in a manner to allow you easy access to the information you need and also to provide your staff with some of the more detail-oriented pollution prevention implementation guidelines. The following key points regarding acquisition pollution prevention are reinforced throughout the guide:

- Pollution prevention programs save money, represent good business practices, and should produce an economic or risk reduction return for your program.

- Pollution prevention is an ongoing process that is part of decision-making during every life cycle phase.

- Pollution prevention is a decision-making process. There are no "right" or "wrong" pollution prevention decisions; only informed choices.

With your conscientious implementation of pollution prevention, the United Stales Army can take a leading role in reducing hazardous waste generation and preventing damage to the environment. Through your efforts, the United States Army can continue to be the model for effective environmental stewardship.

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GLOSSARY OF ACRONYMS

ACRONYM	DEFINITION
AAPPSO	Army Acquisition Pollution Prevention Support Office
AEC	Army Environmental Center (formerly USATHAMA)
AEHA	Army Environmental Hygiene Agency
ALMC	Army Logistics Management College
AMC	Army Materiel Command
AMEC	Army Management Engineering College
APG	Aberdeen Proving Ground
AQMDs	Air Quality Management Districts
AR	Army Regulation
ARDEC	Armament Research, Development, and Engineering Center
BRDEC	Belvoir Research Development and Engineering Center
CAA	Clean Air Act
CALS	Computer Assisted Logistics Support
CDRL	Contract Data Requirements List
C ED	Concept Exploration and Development
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERL	Army Construction Engineering Research Laboratory
CFC	Chlorofluorocarbons
CHAMMP	Comprehensive Hazardous Materials Management Program
CHPPM	Center for Health Promotion and Preventative Medicine [provisional] (formerly AEHA)
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DA	Department of the Army
DED	Data Element Definition
DN	Demonstration and Validation
DID	Data Item Description
DLA	Defense Logistics Agency

ACRONYM	DEFINITION
DLAR	Defense Logistics Agency Regulation
DMWR	Depot Maintenance Work Requirements
DoD	Department of Defense
DIRMS	Defense Reutilization and Marketing Service
DSMC	Defense Systems Management College
DWPA	Deep Water Ports Act
EA	Environmental Assessment
ECP	Engineering Change Proposal
EI-A	Environmental Education Act
Elis	Environmental Impact Statement
EMD	Engineering and Manufacturing Development
EMT	Environmental Management Team
EPA	Environmental Protection Agency
EPAA	Environmental Programs Assistance Act
EPCRA	Emergency Planning and Community Right to Know Act
ESA	Endangered Species Act
ESECA	Energy Supply and Environmental Coordination Act
FFCA	Federal Facilities Compliance Act
F11FRA	Federal Insecticide, Fungicide, and Rodenticide Act
FLPMA	Federal Land Policy Management Act
FONSl	Finding of No Significant Impact
HAPs	Hazardous Air Pollutants
HQ	Headquarters
HSWA	Hazardous Solid Waste Amendment
ILS	Integrated Logistic Support
MATDEV	Materiel Developer
MIL-SPEC	Military Specification
MMPA	Marine Mammal Protection Act
MRSPA	Marine Protection, Research, and Sanctuaries Act
IVlSDS	Material Safety Data Sheet
MS&T	Manufacturing Science and Technology

ACRONYM	DEFINITION
NCA	Noise Control Act
NDCEE	National Defense Center for Environmental Excellence
NWPA	Nuclear Waste Policy Act
OEM	Original Equipment Manufacturer
ODC	Ozone-Depleting Chemical
ODS	Ozone-Depleting Substance
OPA	Oil Pollution Act
OSHA	Occupational Safety and Health Act
PEO	Program Executive Officer
PIP	Product Improvement Program
PM	Program/Project/Product Manager
P PA	Pollution Prevention Act
PWSA	Port and Waterway Safety Act
RCRA	Resource Conservation and Recovery Act
RDTE	Research, Development, Test, and Evaluation
RFP	Request For Proposal
RGQA	Radon Gas Indoor Air Quality Research Act
SDWA	Safe Drinking Water Act
SEL	School of Engineering and Logistics
SIP	State Implementation Plan
SMCRA	Surface Mine Control and Recovery Act
SOPA	Stratospheric Ozone Protection Act
SOW	Scope of Work
SPA	Shore Protection Act
SSWG	System Safety Working Group
SWRCA	Soil and Water Resources Conservation Act
TSCA	Toxic Substances Control Act
LICMJ	Uniform Code of Military Justice

USATHAMA	United States Army Toxic and Hazardous Materials Agency
WBS	Work Breakdown Structure
WPCA	Water Pollution Control Act
WRPA	Water Resources Planning Act

APPENDICES

APPENDIX A
STATE POLLUTION PREVENTION LAW REQUIREMENTS SUMMARY

The following table lists the states that currently have pollution prevention laws and summarizes the key points associated with each state's requirements. All state requirements are based on development of plans that address Toxic Release Inventory (TRI), Large Quantity Generator (LQG), and/or Small Quantity Generator (SQG) pollution prevention issues. As shown, some states require these plans, while others use incentives/fees to motivate industrial compliance.

	Required Plans						
State	**Source Reduction Emphasis**	**Facility**	**TRI**	**LQG**	**SQG**	**Fees**	**Grants/ Incentive**
Alaska	yes	no	no	no	no	none	yes
Arizona	yes	yes	yes	yes	no	LQG	no
California	yes	yes	no	yes	no	none	yes
Colorado	yes	no	no	no	no	TRI & LQG	no
Connecticut	yes	no	no	no	no	none	yes
Delaware	no	no	no	no	no	none	no
Florida	yes	no	no	no	no	none	no
Georgia	yes	yes	no	yes	no	none	no
Illinois	yes	no	no	no	no	none	yes
Indiana	yes	no	no	no	no	none	yes
Iowa	yes	no	no	no	no	TRI	yes
Kentucky	yes	no	no	no	no	none	yes

NOTE: TRI = Toxic Release Inventory
LQG = Large Quantity Generator
SQG = Small Quantity Generator

Required Plans							
State	**Source Reduction Emphasis**	**Facility**	**TRI**	**LQG**	**SQG**	**Fees**	**Grants/ Incentives**
Louisiana	yes	yes	no	yes	yes	none	no
Maine	yes	yes	yes	yes	no	TRI & LQG	yes
Massachusetts	yes	yes	yes	yes	no	TRI	no
Michigan	no	no	no	no	no	none	yes
Minnesota	yes	yes	yes	no	no	TRI & LQG	yes
Mississippi	yes	yes	yes	yes	yes	LQG & SQG	yes
New Jersey	yes	yes	yes	no	no	none	no
New York	yes	yes	no	yes	yes	none	no
North Carolina	no	yes	no	yes	yes	LQG & SQG	yes
Oregon	yes	yes	yes	yes	yes	none	no
Rhode Island	yes	no	no	no	no	none	yes
Tennessee	yes	yes	no	yes	yes	none	no
Texas	yes	yes	yes	yes	yes	none	no
Vermont	yes	no	no	no	no	LQG & SQG	no
Virginia	yes	no	no	no	no	none	yes
Washington	yes	yes	yes	yes	yes	TRI, LQG & SQG	no

NOTE: TRI = Toxic Release Inventory
LQG = Large Quantity Generator
SQG = Small Quantity Generator

Required Plans							
State	**Source Reduction Emphasis**	**Facility**	**TRI**	**LQG**	**SQG**	**Fees**	**Grants/ Incentives**
Wisconsin	yes	no	no	no	no	none	yes

NOTE: TRI = Toxic Release Inventory
LQG = Large Quantity Generator
SQG = Small Quantity Generator

APPENDIX B
STATE POLLUTION PREVENTION CONTACTS AND PROGRAMS

PROGRAM/SERVICES	LOCATION/ADDRESS	TELEPHONE
Alabama Hazardous Materials Management Program	241 Mineral Ind. Building University of Alabama P. 0. 870203 Tuscaloosa, AL 35487-9644	(205) 348-1102
Alaska Pollution Prevention Program	Department of Environmental Conservation 4110 Willoughby Ave. Juneau, AK 99807	(907) 465-5050
Waste Reduction Assistance Program/ Small Business Hazardous Materials Management Project	Alaska Health Project 1818 West Northern Lights Blvd. Suite 103 Anchorage, AK 99517	(907) 276-2864
Arkansas Arkansas Department of Pollution Control and Ecology	Hazardous Waste Division Arkansas Department of Pollution Control and Ecology P. 0. Box 8913 Little Rock, AR 72219-8913	(501) 570-2860
California Toxic Substances Control Program	Department of Health Services Alternative Technology Division P. 0. Box 942732 Sacramento, CA 95812-0806	(916) 322-3670
Colorado Waste Minimization Assessment Center	Dept of Mechanical Engineering Colorado State University Fort Collins, CO 80523	(303) 491-5317
Pollution Prevention Center	Office of Health and Enviro-nmental Protection Colorado Department of Health 4300 Cherry Creek Drive, South Bldg B Denver, CO 80222	(303) 692-2000

PROGRAM/SERVICES	LOCATION/ADDRESS	TELEPHONE
Connecticut Connecticut Hazardous Waste Management Service	5050 Columbus Avenue Hartford, C T 06106	(203) 244-2007
Delaware Pollution Prevention Program	Dept. of Natural Resource and Environmental Control P.O. Box 1401 Dover, DE 19903	(302) 739-3822
Florida Hazardous Waste .Reduction Assistance .Program	Department of Environmental Regulations Twin Towers Building 2600 Blair Stone Road Tallahassee, FL 32399-2400	(904) 488-0300
Georgia Hazardous Waste Management Program	Environmental Protection Division Georgia Department of Natural Resources Floyd Tower East, Suite 1154 205 Butler Street SE Atlanta, GA 30334	(404) 656-2833
Waste Reduction and Environmental Compliance (WREC) Program	Environmental Science and Technology Laboratory Georgia Tech Research Institute Atlanta, GA 30332-0834	(404) 894-3806
Hawaii Solid and Hazardous Waste Branch	Hawaii State Department of Health 911 Ala Moana Boulevard Honolulu, HI 96814	(808) 586-4225
Idaho Hazardous Materials Bureau	1410 N. Hilton Street Boise, ID 83706-1255	(208) 334-5879
Illinois Office of Pollution Prevention	Illinois EPA 2200 Churchill Road Springfield, IL 62702	(217) 782-8700
Hazardous Waste Research and Information Center	One Hastlewood Drive Savoy, IL 61820	(217) 333-8940

PROGRAM/SERVICES	LOCATION/ADDRESS	TELEPHONE
Indiana Office of Pollution Prevention and Technical Assistance	Indiana Department of Environmental Management 100 N. Senate Avenue P. 0. Box 6015 Indianapolis, IN 46206-6015	(317) 232-8172
Iowa Waste Management Authority Division	Wallace State Office Building Des Moines, IA 50319	(515) 281-8489
Iowa Waste Reduction Center	University of Northern Iowa 75 BRC Cedar Falls, IA 50614-0185	(319) 273-2079
Kansas Department of Health and Environment	Forbes Field Building 740 Topeka, KS 66620	(913) 296-1603
Kentucky Kentucky Partners	Waste Reduction Center Room 312 Ernst Hall University of Louisville Louisville, KY 40292	(505) 852-7260
Maine Bureau of Oil and Hazardous Materials Control	Department of Environmental Protection State House Station #17 Augusta, ME 04333	(207) 287-2651
Maine Waste Management Agency	Office of Economics and Community Development State House Station #154 Augusta, ME 04333	(207) 287-5300
Maryland Hazardous Waste Program	Department of Environment 2500 Broening Highway, Bldg. 40 Baltimore, MD 21224	(410) 631-3343
Technical Extension Service	Engineering Research Center of University of Maryland College Park, MD 20742	(301) 405-3883

PROGRAM/SERVICES	LOCATION/ADDRESS	TELEPHONE
Michigan Office of Waste Reduction Services	Department of Commerce 116 W. Allegan P. 0. Box 30004 Lansing, MI 48909	(517) 335-1178
Minnesota Minnesota Pollution Control Agency	Hazardous Waste Division 520 Lafayette Road St. Paul, MN 55155	(612) 297-8362
Minnesota Technical Assistance Program	Box 197, Mayo Building University of Minnesota 1313 5th Street, SE Suite 207 Minneapolis, MN 55414	(612) 627-4646
Mississippi Mississippi Technical Assistance Program	Mississippi State University Department of Chemical Engineering P.O. Drawer CN Mississippi State, MS 39762	(601) 325-8454
Waste Reduction/Waste Minimization Program	Department of Environmental Quality P. 0. Box 10385 Jackson, MS 39289-0385	(601) 961-5241
Montana Department of Health and Environmental Sciences	Waste Management Division Cogswell Building Room B- 102 Helena, MT 59620	(406) 444-1430
Nebraska Pollution Prevention Office	Department of Environmental Control P.O. Box 98922 Lincoln, NE 68509-8922	(402) 471-4217
Nevada Small Business Development Center	Department of Business Administration Room 411 University of Nevada Reno, NV 89557	(702) 784-1717

PROGRAM/SERVICES	LOCATION/ADDRESS	TELEPHONE
New Hampshire Waste Management Division	Department of Environmental Services 6 Hazen Drive Concord, NH 03301-6509	(603) 271-2901
New Jersey Office of Pollution Prevention	New Jersey Department of Environmental Protection CN423 401 E. State Street Trenton, NJ 08625	(609) 777-0518
New Mexico Hazardous Waste and Radiation Bureau	1190 St. Francis Drive P.O. Box 26110 Santa Fe, NM 87502	(505) 827-2926
New York Bureau of Pollution Prevention	New York State Department of Environmental Conservation 50 Wolf Road Albany, NY 12233-7253	(518) 457-7267
North Carolina Office of Waste Reduction	North Carolina Department of Environment, Health, and Natural Resources P. 0. Box 27687 Raleigh, NC 27611-7687	(919) 571-4100
Ohio Environmental Protection Agency	Hazardous Waste Management 1800 Watermark Columbus, OH 43215-1099	(614) 644-2917
American Institute for Pollution Prevention	Dept. of Civil and Environmental Engineering University of Cincinnati 1275 Section Road Cincinnati, OH 45237	(513) 556-2517
Oklahoma Pollution Prevention Technical Assistance	Oklahoma Department of Health 1000 NE 10th Street Oklahoma City, OK 73117-1212	(405) 271-7047
Oregon Hazardous Waste Reduction Program	Department of Environmental Quality 811 SW 6th Avenue Portland, OR 97204-1390	(503) 229-5913

PROGRAM/SERVICES	LOCATION/ADDRESS	TELEPHONE
Pennsylvania Center for Hazardous Materials Research	University of Pittsburgh Applied Research Center 320 William Pitt Way Pittsburgh, PA 15238	(412) 826-5024
Department of Environmental Services	P. 0. Box 2063 Harrisburg, PA 17105-2063	(717) 787-7382
Rhode Island Hazardous Waste Reduction Section	Office of Environmental Coordination 83 Park Street Providence, RI 29208	(401) 277-3434
South Carolina Waste Management Program	Carolina Plaza 937 Assembly Street Columbia, SC 29201	(803) 777-8157
Hazardous Waste Management Research Fund	Institute of Public Affairs University of South Carolina Columbia, SC 29208	(803) 777-3153
South Dakota Waste Management Program	Department of Environment and Natural Resources Division of Environmental Regulation 523 East Capital Street Pierre, SD 57501-3181	(605) 773-3153
Tennessee Bureau of Environment	Department of Health and Environment 401 Church Street 14th Floor, LNC Tower Nashville, TN 37243-0454	(615) 532-0736
Texas Natural Resources Conservation Commission	Texas Water Commission P. 0. Box 13087 Capital Station Austin, TX 78711-3087	(512) 239-1000
Texas Hazardous Waste Research Center	Lamar University P. 0. Box 10613 Beaumont, TX 77710-0613	(409) 880-8768

PROGRAM/SERVICES	LOCATION/ADDRESS	TELEPHONE
Center for Hazardous and Toxic Waste Studies	Texas Tech University P.O. Box 43121 Lubbock, TX 79409-3121	(806) 742-1413
Utah Department of Environmental Quality	P.O. Box 144870 Salt Lake City, UT 84114-4870	(801) 538-6146
Vermont Vermont Waste Minimization Program	Hazardous Waste Management Section - Agency of Natural Resources 103 S. Main Street Waterbury, VT 05671	(802) 241-3444
Virginia Pollution Prevention	Department of Environmental Quality P. 0. Box 10009 Richmond, VA 23240	(804) 762-4374
Washington Waste Reduction, Recycling and Litter Control Program	Department of Ecology Mail Stop 47600 Olympia, WA 98504-8711	(206) 407-6000
West Virginia Generator Assistance Program	Board of Solid Waste Management 1615 Washington Street, E Charleston, WV 25311-2126	(304) 558-0844
Wisconsin Bureau of Solid and Hazardous Waste	Wisconsin Department of Natural Resources Box 7921 Madison, WI 53707	(608) 267-3763.
Wyoming Solid Waste Management Program	Department of Environmental Quality 122 W. 25th Street Herschler Building 4 W Cheyenne, WY 82002	(307) 777-7752

APPENDIX C
INTERNATIONAL POLLUTION PREVENTION PROGRAM CONTACTS

PROGRAM/LOCATION	TELEPHONE
UNEP North American Regional Office	(212) 963-8139/8
UNEP Washington, DC Office	(202) 289-8456
UNEP Environmental Laws Institutions Unit Nairobi KENYA	254-92-226886
UNEP Director, Regional Office, Europe Geneva SWITZERLAND	41-22-758-1189
Multilateral Fund for Implementation of the Montreal Protocol	(514) 282-1122
Great Lakes Pollution Prevention Centre 265 N. Front Street Samin, Ontario N7T 7X1 CANADA	(800) 667-9790

APPENDIX D
U.S. ARMY POLLUTION PREVENTION TRAINING RESOURCES

PROGRAM/SERVICES	LOCATION/ADDRESS	TELEPHONE
Director, Environmental Programs	Assistant Chief of Staff For Installation Management Attn: DAIM-ED-P2 600 Pentagon Washington, DC 20310-0600	COMM: (703) 696-8813 DSN: 226-8813
U.S. Army Materiel Command (AAPPSO)	Army Acquisition Pollution Prevention Support Office ATTN: AMCRD-E/SARD-ZCS-E 5001 Eisenhower Avenue Alexandria, VA 22333-0001	COMM: (703) 274-9488 DSN: 284-9488
U.S. Army Environmental Center	U.S. Army Environmental Center ATTN: SFIM-E-AEC-ECP Aberdeen Proving Ground, MD 21010-5401	COMM: (410) 671-1685 DSN: 584-1685
U.S. Army Logistics Management College (ALMC)	U.S. Army Logistics Management College ATTN: APSZ-LSE Fort Lee, VA 23801-6050	COMM: (804) 765-4731/4806 DSN: 539-4731/ 4806
U.S. Army Corps of Engineers	Commander Army Engineering Division, Huntsville ATTN: CEHND-TD-ET P.O. Box 1600 Huntsville, AL 35807-4301	COMM: (205) 722-5891

APPENDIX E
U.S. ARMY POLLUTION PREVENTION
TECHNICAL RESOURCES

SUBJECT	LOCATION/ADDRESS	TELEPHONE
Pollution Prevention and Toxicology	Army Acquisition Pollution Prevention Support Office ATTN: AMCRD-E/SARD-ZCS-E 5001 Eisenhower Avenue Alexandria, VA 22333-0001	COMM: (703) 274-5964 DSN: 284-5964
Toxicology	U.S. Army Environmental Hygiene Agency (AEHA) or Center for Health Promotion and Preventative Medicine (CHPPM) Toxicology Division ATTN: HSHB-MO-T Aberdeen Proving Ground, MD 21010 -5422	COMM: (410) 671-3980 DSN: 584-3980
Air Pollution	AEHA/CHPPM - Air Pollution Engineering Division ATTN: HSHB-ME-A Aberdeen Proving Ground, MD 21010 5422	COMM: (410) 671-2509 DSN: 584- 2509
Waste Disposal	AEHA/CHPPM Waste Disposal Engineering Division ATTN: HSHB-ME-S Aberdeen Proving Ground, MD 21010 5422	COMM: (410) 671-2953 DSN: 584-2953
Groundwater and Solid Waste Management	AEHA/CHPPM Groundwater and Solid Waste Management Branch ATTN: HSHB-ME-S Aberdeen Proving Ground, MD 21010 5422	COMM: (410) 671-2024 DSN: 584-2024
Paints and Organic Coating System	U.S. Army Research Laboratory Fort Belvoir, VA 22060-5606	COMM: (703) 704-2799 DSN: 354-2799

APPENDIX F
FEDERAL POLLUTION PREVENTION PROGRAM INFORMATION AND/OR TRAINING RESOURCES

PROGRAM	ADDRESS	SERVICES	TELEPHONE
Pollution Prevention Information Clearinghouse	U.S. EPA 401 M Street, SW (3404) Washington, DC 20460	Document distribution of Federal, State and local regulations, policies and standards. Referral service to other pollution prevention agencies and EPA programs	(202) 260-1023
Stratospheric Protection Division	U.S. EPA 401 M Street, SW (6205 J) Washington, DC 20460	Provides guidance and assistance with Clean Air Act, and assists with identifying substitutes for Ozone Depleting Chemicals (ODCs). Offers hotline assistance, "Stratospheric Ozone Information Hotline" (800) 296-7996	(202) 233-9410
Urban Air Quality Office	U.S. EPA 401 M Street, SW (8101) Washington, DC 20460	Scientific and technical guidance in the following areas: air quality and source monitoring, emission factors and inventories, and pollution control strategies. Consulting support with Federal air pollution regulations, policies, and standards.	(202) 260-5575

PROGRAM	ADDRESS	SERVICES	TELEPHONE
Toxic Substance Control Act Program	Hotline	Consulting and guidance on pollution prevention, Federal regulations, and policies. CHEMICAL-IN PROCESS-BULLETIN, offers up-to-date information on pollution prevention and toxic substances.	(202) 554-1404
SUPERFUND/RCRN EPCRA Program	Hotline	Assistance and guidance with SUPERFUND, RCRA, EPCRA, and other Federal regulations/policies. Other areas of assistance include: underground storage areas, radiation site clean-up, risk management programs. HAZMAT emergency planning and reporting, and the identification, transportation, handling, treatment and disposal of solid and hazardous waste.	(800) 424-9346

APPENDIX G

NATIONAL AEROSPACE STANDARD 411

29 APRIL 1994

National Aerospace Standard NAS411

Hazardous Materials Management Program

NOTE TO READER: ***NAS411 WAS ADOPTED BY DOD, APRIL 1994***
DATA ITEM DESCRIPTIONS AVAILABLE FOR USE WITH NAS411:
DI-MISC-81397 Hazardous Materials Management Report
DI-MISC-81398 Hazardous Materials Management Plan

Aerospace
Industries
Association

Aerospace Industries Association

NATIONAL AEROSPACE STANDARD

FED SUP CLASS

1. HAZARDOUS MATERIALS MANAGEMENT PROGRAM

1.1 Scope. This NAS411 was created by the Aerospace Industries Association as an industry standard to be applied to United States government acquisition of systems, system components, associated support items, and facilities. It applies to all acquisition phases; e.g.., Concept Exploration, Demonstration and Validation, Engineering and Manufacturing Development, Production and Deployment, Operations and Support, and Disposition.

The Hazardous Materials Management Program (HMMP) is the contractor's plan to assure appropriate consideration is given to the elimination/reduction of hazardous materials, and to the proper control of hazardous materials that are not eliminated, for system(s), system components, and associated support items throughout all phases of the system life cycle. The emphasis is on eliminating or reducing hazardous materials early in the design of processes and system products.

This NAS411 shall only be applicable to those contract deliverables that are specifically cited elsewhere in the contract as being subject to this standard.

1.2 Purpose. The purpose of the HMMP is to influence the system and product design process to eliminate, reduce or minimize hazardous materials, and control hazardous materials in all acquisition phases of a program for the protection of human health and the environment. This is to be accomplished while minimizing system cost and risk to system performance.

1.3 Tailoring. Tasks described in this NAS411 shall be tailored to meet acquisition program requirements. The applicable tasks shall be negotiated with the contractor based upon the requirements of the acquisition phase and size of the program.

1.4 Consistency. Tasks described herein are to be consistently applied across all contractor programs, if appropriate, to allow plant-wide uniformity in practices and processes. The Contracting Officer shall designate a representative(s) who has the authority to grant waivers or approve deviations from conflicting requirements for alternative processes and materials. Tasks performed after system delivery may be performed on a contract by contract basis in accordance with the contract statement of work.

1.5 Compatibility With Existing Regulations. The contractor may satisfy HMMP data requirements by referencing or resubmitting data in the format already required by any regulation or statute. Data requirements that exceed or differ from existing statutory or regulatory requirements shall be subject to the provisions of the "Changes" clause in the contract.

LIST OF CURRENT SHEETS

NO.	REV.	NO.	REV.
1	2	5	1
2	1	6	1
3	2		
4	1		

CUSTODIAN PROCUREMENT TECHNIQUES COMMITTEE		THIRD ANGLE PROJECTION
PROCURMENT SPECIFICATION NONE	TITLE HAZARDOUS MATERIALS MANAGEMENT PROGRAM	CLASSIFICATION STANDARD PRACTICE
		NAS411
		SHEET 1 OF 6

APPROVAL DATE JULY 1993 REVISION (1) 11 MARCH 1994 (2) 29 APRIL 1994

2. DEFINITIONS

2.1 Acronyms Used in NAS411. The acronyms used in this NAS411 are defined as follows:

a. DoD - Department of Defense
b. OSHA - Occupational Safety and Health Administration
c. MSDS - Material Safety Data Sheet
d. PM - Program Manager
e. PCO - Procuring Contracting Officer
f. HMMP - Hazardous Materials Management Program
g. SOW - Statement of Work
h. FAR - Federal Acquisition Regulation
i. RFP - Request for Proposal
j. CAS - Chemical Abstract Service
k. ACO - Administrative Contracting Officer
l. CO - Contracting Officer
m. DFARS - Defense Federal Acquisition Regulation Supplement

2.2 Definitions. The following definitions apply:

2.2.1 Hazardous Materials. Any material that due to its chemical, physical, or biological nature that causes safety, public health, or environmental concerns.

2.2.2 Hazardous Materials Management Program (HMMP) Plan. A description of the planned tasks and activities to be used by the contractor to implement the system Hazardous Materials Management Program. The HMMP is to be used in the context of the management strategy for which improvements may be made to eliminate, minimize or control hazardous materials.

2.2.3 Contracting Officer (CO). A person with the authority to enter into, administer, and/or terminate contracts on behalf of the government. The Procuring Contracting Officer (PCO) refers to the person at the buying activity who has the authority to enter into contracts. The Administrative Contracting Officer (ACO) refers to the person at the contract administration office, e.g. DPRO, who performs post award functions.

2.2.4 Hazardous Materials Indentification. The process used to identify hazardous materials required for operation and support.

3. GENERAL HAZARDOUS MATERIALS MANAGEMENT PROGRAM REQUIREMENTS

3.1 HMMP Requirements. The contractor shall conduct a Hazardous Materials Management Program (HMMP) which will include measures for the elimination, reduction, or control of hazardous materials. An HMMP shall be tailored for each acquisition phase of the system as appropriate to the acquisition phase and available funding and consistent with procuring activity projections of the scope and probability of subsequent systems acquisition.

3.2 HMMP Applications. The contractor may apply the HMMP on a plant-wide basis, a contract specific basis, or a combination of plant-wide and contract specific.

3.3 Changes and Conflicting Requirements. The contractor shall notify the procuring activity of any changes to the HMMP or conflicts between the HMMP and the other contract requirements, regulations or statutes. The contractor shall request resolution from the CO in the event of conflicting requirements between the HMMP and local, state, and federal environmental regulations. Any changes to the HMMP shall be subject to the provisions of the "Changes" clause in the contract.

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3.4 Approved Plan. The approved HMMP Plan provides the basis of understanding between the contractor and the procuring agency with respect to how the HMMP shall be executed to meet contractual requirements.

4. SPECIFIC HAZARDOUS MATERIAL PROGRAM REQUIREMENTS

4.1 Hazardous Materials Management Program (HMMP) Plan Proposal Requirement. In accordance with the solicitation, the Preliminary HMMP Plan shall be submitted to the procuring activity as part of the proposal. This Preliminary HMMP Plan shall describe an overview of the contractor's HMMP. The successful offeror will provide a full HMMP Plan described in Section 5.2. (2)

4.2 HMMP Objectives. The HMMP Plan shall define the management strategy to systematically eliminate, minimize, or control hazardous materials while maintaining an appropriate balance with performance requirements specified in the contract and the cost of the HMMP. The HMMP Plan shall define the contractor's approach to assure that:

a. Consideration is given throughout all acquisition phases of the system;

b. Hazardous materials and processes associated with each contract hardware deliverable item are selectively identified and evaluated based on environmental and health concerns;

c. Hazardous materials elimination, minimization, or control are considered and detailed in the system design and the manufacturing processes.

4.3 HMMP Plan Tasks. The following tasks will be tailored to reflect the program and acquisition phase:

4.3.1 Organization Structure. The HMMP Plan shall identify and describe organizational and functional relationships and the lines of communication using contractor specified format. Responsibility for each task shall be described with respect to its organizational element.

4.3.2 Hazardous Materials Identification/Analysis/Evaluation. The HMMP Plan shall define the process the contractor will use to identify the hazardous materials to be addressed in the performance of the contract. The procuring activity may identify and prioritize in the contract the specific hazardous materials for elimination, minimization, or control. The Plan will also identify those hazardous materials that will be selected for reporting under the contract. The Plan will describe the analysis and prioritization techniques to be used to evaluate the risks associated with those identified hazardous materials. The description shall include the contractor's process for material selection and evaluation. The Plan shall also identify the specific information to be provided to the procuring activity as prescribed in Section 5. (2)

4.3.3. Environmental and Health Evaluation. The HMMP Plan shall describe the basis of evaluation and data base(s), to be used for the environmental and health risk evaluation. Where a material to be used falls under the Toxic Substances Control Act Section 5(a) research and development exception, the HMMP Plan shall describe the process and the timing of the process which will be used to evaluate potential hazards and communicate these hazards to the contracting agency.

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4.3.4 Trade-off Analysis. The HMMP Plan shall define the overall process to:

- Analyze the potential costs associated with trading a hazardous material for a less hazardous material over the life cycle of the product subject to data available at time of delivery;
- Document the trade-off analysis (including cost/benefit analyses) employed for selecting materials and processes;
- Assign responsibility for specific tasks.

4.3.4.1 Trade-off Analysis Documentation and Recommendations. The HMMP Plan shall describe the selection process and criteria to be used for screening hazardous materials. The HMMP Plan shall describe the documentation process to be utilized to establish a record of any Trade-off Analysis activity and the development of recommendations. This record shall contain the justifications for using a specific material or process, and the reasons for rejecting other materials and processes. The record shall include known potential costs of particular hazardous materials in various phases of military use. The HMMP Plan shall identify the medium by which the contractor will provide this information to the contracting agency.

4.3.4.2 Assignment of Responsibility. The HMMP Plan shall identify the contractor functions with the responsibility to implement actions resulting from the trade-off analysis.

4.3.5 Subcontractor Requirements. The prime contractor shall describe how and to what extent the HMMP requirements will be flowed down to subcontractors.

4.3.6 Milestones. The HMMP Plan shall define significant HMMP milestones and provide an implementation schedule.

4.3.7 Training. The HMMP Plan shall identify the contractor's approach for any specialized training to support the objectives of the HMMP.

4.3.8 Functional Program Integration. The HMMP shall describe the methods and procedures that will be used to integrate and coordinate the HMMP requirements throughout other applicable functional programs and master plans.

4.4 Report Content Requirements. The HMMP Report shall contain the following information.

4.4.1 Identification of all hazardous materials delivered and required for operation and support to include the following:

- Material Safety Data Sheet;
- Corresponding Specifications and Standards that require the use of the hazardous material;
- Where used in operation and support or within the deliverable item;
- If applicable, at the time of delivery, identify any U.S. statutory phase-outs or bans. As appropriate the contractor and the procuring activity will negotiate the identification of other worldwide hazardous materials legal considerations.

4.4.2 Hazard Evaluation to include the following:

- List of prioritized hazardous materials;
- Basis for priority determination;
- Processes using prioritized hazardous materials;
- Corresponding military process specification;
- Alternative material and process considerations.

4.4.3. Trade-Off Analysis as required in 4.3.4 to include the following:
- Cost/Benefit Analysis;
- Itemization of non-cost variables affecting trade-off;
- Trade-Off analysis conditions and assumptions;
- Hazardous materials and process use recommendations.

5. DATA SUBMITTALS

5.1 Reporting Requirements. The HMMP Report data submittals shall be submitted as required by the contract activity, e.g. Contract Data Requirements List (CDRL)

5.2 HMMP Plan

5.2.1 Format. The HMMP Plan format shall be contractor selected.

5.2.2 Table of Contents. Identification of the elements of the HMMP Plan shall be correlated to the paragraph and page numbers of the plan.

5.2.3 Glossary. The HMMP Plan shall contain a list of definitions of all unique words, acronyms, and symbols used in the Plan.

5.2.4 Scope. The HMMP Plan shall describe the scope of the HMMP for the applicable contract line items in accordance with Section 1.1 herein.

5.2.5 Schedule and Milestones. The HMMP Plan shall describe the HMMP schedule and milestones.

5.2.6 Plan Content Requirements.

5.2.6.1 Contractor HMMP organizational identification, outline and responsibilities, as described in Section 4.3.1.

5.2.6.2 Methods of hazardous materials identification, analysis and evaluation, as described in Section 4.3.2.

5.2.6.3 Methods for performing chemical elimination/minimization trade-off analysis, as described in Section 4.3.4.

5.2.6.4 The contractor shall describe the scope and procedures of subcontractor flowdown, as described in Section 4.3.5.

5.2.6.5 Special Hazardous materials training requirements, as described in Section 4.3.7.

5.2.6.6 Methods of HMMP integration with other functional programs, as described in Section 4.3.8.5

5.3 Report.

5.3.1 Format. The report format shall be contractor selected.

5.3.1.1 In the event of a follow-on contract, the contractor may use the previously submitted HMMP report as a baseline and show changes made per the follow-on contract so that the HMMP remains a "living document."

APPROVAL DATE JULY 1993 REVISION (1) 11 MARCH 1994

5.3.2 Table of Contents. Identification of the elements of the HMMP Report shall be correlated to the paragraph and page numbers of the Plan.

5.3.3 Glossary. The HMMP Report shall contain a list of definitions of all unique words, acronyms, and symbols used in the Plan.

5.3.4 Report Contents: The contractor shall report the information described in section 4.4.

(1) COMPLETELY REVISED