

Environmental Management System ISO 14001:2004

Handbook of Transition with CD-ROM

Syed Imtiaz Haider, Ph.D.



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This book is dedicated to my loving father Syed Mohsin Raza and my late mother Khursheed-un-Nisan. I am also thankful to my wife Shazia Fatima, son Syed Zeeshan Haider, and daughter Syeda Mehreen Fatima for their patience and for providing a professional environment. I also thank my colleague Hima Vatee, who agreed to assist in the proofreading of this book.

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Preface

On November 15, 2004, the International Organization for Standardization (ISO) issued the second editions of ISO 14001 and ISO 14004. This revision to the standards is part of ISO's commitment to periodically review and update each standard and concludes more than three years' work by the ISO Technical Committee (TC207) responsible for their development and maintenance.

According to the introduction to ISO 14001, "The second edition of this International Standard is focused on clarification of the first edition, and has taken due consideration of the provisions of ISO 9001 to enhance the compatibility of the two standards for the benefit of the user community." Although every clause and subclause of the 1996 version have undergone some level of revision, most of the changes are minor adjustments in terminology for clarification purposes. In most cases, a system correctly implemented and in conformance with the certification requirements will need only minor changes to conform to the new version of the standard.

The first general change is that, throughout the document, the phrase "establish and maintain a procedure" has been changed to "establish, *implement* and maintain a procedure." Organizations that have sought certification of their Environmental Management System (EMS) have always had to demonstrate implementation of their systems in order to become certified, and this will not result in any change in the audit's approach. This change in wording will likely have little impact in any case, except possibly where an organization has self-declared the existence of an EMS and where actual implementation of the system may be weak.

Another general change is the elimination of almost all specific requirements for a "documented procedure." In fact, the only place where this requirement is still stated is in clause 4.4.6 (operational control) and even there it is modified by "... to control situations where their absence could lead to deviation from the environmental policy, objectives and targets," as it did in the 1996 version. Another remaining reference to procedural documentation exists in the definition of internal audit (3.14), which states that an audit is a "... documented process" Even with this elimination of references to the documented procedures, however, documentation remains important to the establishment and maintenance of the EMS. This is evident in clause 4.1, which requires that the organization "... establish, *document*, implement, maintain and continually improve an environmental management system ..." where "document" is an addition to this clause since the 1996 version. Generally, though, the new wording of the requirements allows the organization greater flexibility in determining

where and at what level documentation should be developed. Despite these changes in language, the position of auditors will change little. While we can no longer require documented procedures as defined in some of the elements of the 1996 standard, we will continue to expect documentation, in one form or another, wherever it is necessary to ensure consistent structure and implementation of the EMS.

All audits conducted after May 15, 2005 are in accordance to the 2004 version of the standard.

After May 15, 2006, the 1996 version of the ISO 14001 became obsolete, and no certifications to that version of the standard are maintained.

The compliance to the international environmental standards is essential to be in harmony with Mother Nature. The development, implementation, and maintenance of key standard operating procedures (SOPs) are essential to an EMS and are a requirement of the ISO 14001:2004. The revised ISO 14001:2004 standard assures that the shareholders, customers, and the employees of corporations have much to gain from EMS as we owe it to our future generation. Writing SOPs can be time consuming for those new to the EMS. Moreover, the EMS does not specify how the SOPs are to be written, what format they should be in, or how many are enough. Those new to ISO 14001:2004 compliance may have difficulty knowing the best route to take. Generally, companies new to the EMS are allowed an adequate amount of time for remedial action and demonstration of their commitment to environmental compliance and continuous improvement. Documentation management, however, can minimize the number of adverse findings for incomplete or missing SOPs and prevent repeated adverse findings by making the development of SOPs a top priority. The first step is to develop an adequate set of SOPs for the EMS activities and the overall program. The CD-ROM provides template of EMS manual and a set of SOPs in hard copy and in electronic form that address the most important elements of an EMS program. These SOPs can readily be adapted to a facility's needs and style. This manual should greatly facilitate understanding of the ISO 14001:2004 and how best to develop an environmental compliance program to derive the benefits such as

- No international trade barriers
- Zero accidents
- Regulatory compliance local and international
- Operational cost saving
- Healthy and safe work environment at the site
- Reduction of penalties due to local legislations
- Reduction of waste generation and disposal cost
- Energy conservation

- Reduction of raw material/resource usage
- Marketing edge over competitors
- Improved company credibility
- Reduction in insurance premiums
- Uninterrupted operations
- Good public opinion
- Improved process efficiency
- Proactive environmental insurance provisions
- Motivating employees

The EMS manual and SOPs on the included CD-ROM are valuable tools for companies in the process of developing or transitioning to achieve the ISO 14001:2004 certification/registration. The documentation package is especially relevant to quality assurance personnel, engineers, field engineers, utilities engineers, computer engineers, validation designers, internal and external auditors, or to anyone interested in developing an EMS.

The book contains information from the ABB practical guide, ISO 14001 issue date January 2000. The author is deeply grateful to ABB and Curt Hericson for granting permission for reprinting requested text.

The author believes that by following these generic examples of the manual and procedures, both new and experienced companies can benefit by enhancing their existing documentation to meet ISO 14001:2004 requirements and other legal requirements. Currently, no document specifically describes the format of the EMS manual and SOPs.

Syed Imtiaz Haider, PhD

About the Book

This book takes into account the documentation of environmental management system (EMS) and applicable procedures based on the elements described in the second edition of international standard ISO 14001:2004. No other manual in print deals exclusively with the key elements of EMS and provides hands-on templates tailored to achieve a smooth transition and registration/certification.

The ISO 14001:2004 EMS manual, together with 22 standard operating procedures, examples of policies, objectives, targets, and programs with a practical help section provide explicit instructions on how to achieve the standard for anyone, especially those individuals responsible for writing and executing the EMS manual and applicable procedures. Included herein is a ready-to-use template, on a CD-ROM that one can immediately use as his own without “reinventing the wheel,” thus saving time and money without missing any critical quality elements.

The book and CD-ROM provide a complete, single-source reference, with practical help based on EMS elements described in the ISO 14001:2004 international standard.

This manual offers instant answers for professional auditors, environmental managers, engineers, field engineers, EMS coordinators, auditors, and protocol writers regarding what should be included in the EMS manual and ISO 14001:2004 standard operating procedures to achieve compliance.

Introduction

- Objective
- Definitions
- Correspondence between ISO 14001:1996 and ISO 14001:2004
- Correspondence between ISO 9001:2008 and ISO 14001:2004
- Correspondence between ISO 14001:2004 and ISO 9001:2008
- Certification

Environmental Management and Systems Manual

- ISO 14001:2004 Compliance Manual

Standard Operating Procedures

- General requirements
- Environmental policy
- Planning
- Environmental aspects
- Legal and other requirements
- Objectives and targets
- Environmental management program(s)
- Implementation and operation
- Resources, roles, responsibility, and authority
- Competence, awareness, and training
- Communication
- Documentation
- Control of documents
- Operational control
- Emergency preparedness and response
- Checking and corrective action
- Monitoring and measurement
- Evaluation of compliance
- Nonconformity, corrective action, and preventive action
- Control of records
- Internal audit
- Management review
- Examples of environmental policy statements
- EMS examples
- Practical help
- Recommended readings

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The author thanks his friends and colleagues for their encouragement and for creating a professional environment. Special thanks to the staff of the CRC Press, particularly, for their patience and diligence in the production of this book.

Last but not least, I am sincerely thankful to Dr. Ayman Sahli, the general manager of Julphar, Gulf Pharmaceutical Industries, United Arab Emirates, for providing continuous support to the development of my professional skills, which resulted in consolidation of my experience into practical applicable handbooks.

Author

Syed Imtiaz Haider earned his PhD in chemistry and is a quality assurance and environmental specialist with over 20 years of experience in aseptic and nonaseptic pharmaceutical processes, equipment validation, and in-process control and auditing. Dr. Haider is currently involved in several major biotechnology-based tasks, which include cell line qualification, process validation, bio-analytical method validation, biosimilars comparative studies, organizing preclinical studies, and preparation of files as per Central Technical Dossier (CTD) format for regulatory submission. Dr. Haider is the author and coauthor of more than 20 research publications in international refereed journals dealing with products of pharmaceutical interest, their isolation, and structure development. A professional technical writer, Dr. Haider has authored more than 2000 standard operating procedures based on the Food and Drug Administration (FDA) regulations, ISO 9001:2000, and ISO 14001:2004 standards. He is a certified QMS auditor of the International Register of Certified Auditors (IRCA) and a registered associate environmental auditor of EARA. He has written more than 10 quality system manuals for multidisciplinary industries and provided consultancy to the Ministry of Health, United Arab Emirates, Drug Control Laboratory, in developing a quality management system based on the ISO 9003 and later transition to ISO 9001:2000.

Dr. Haider is working as a quality affairs director at Julphar, Gulf Pharmaceutical Industries. He is involved in the preparation of several abbreviated new drug application (ANDA) files, followed by successful FDA, EU GMP inspections leading to export of finished pharmaceutical products to the U.S. and European markets. He has also written *ISO 9001:2000: Document Development Compliance Manual: A Complete Guide and CD-ROM* and *Pharmaceutical Validation Master Plan, The Ultimate Guide to FDA, GMP, and GLP Compliance*. Dr. Haider holds the intellectual copyright certificate of registration on an electronic documentation package on ISO 9000 and ISO 14001 from the Canadian Intellectual Property Office. He is also a contributing author of chapters on ISO 9001: 2000 and ISO 14001 in international publications.

Dr. Haider is also involved in organizing cGMP conferences in the region and resourcing competitive speakers from Europe, Canada, and the United States.

Introduction

Environmental Management System ISO 14001:2004: Handbook of Transition with CD-ROM is comprised of the manual and applicable procedures fully updated to meet the new requirements of ISO 14001:2004.

The book provides administrative solutions for management in both text and software for successful transition in the shortest possible time frame. The contents of the book address the following:

- Introduction
- Definitions
- Correspondence between ISO 14001:1996 and ISO 14001:2004
- Correspondence between ISO 9001:2008 and ISO 14001:2004
- Correspondence between ISO 14001:2004 and ISO 9001:2008
- Certification
- Documented Environmental Management System Manual ISO 14001:2004
- Twenty-two documented standard operating procedures based on the elements defined in the ISO 14001:2004 series of standard
- Examples of policies
- Examples of EMS objectives, targets, and programs
- Practical help

The environmental system manual and standard operating procedures in text and on the CD-ROM are valuable tools for those companies that are in a process of adopting and incorporating the requirements of ISO 14001:2004 published in November 2004 in their existing system or planning to apply for registration in future. The documentation package is especially relevant to EMS coordinators, management representatives, engineers, field engineers, designers, internal auditors, external auditors, or to anyone interested in developing a documented system.

The EMS manual and standard operating procedures are provided both in text and in an electronic form on CD-ROM for customers' convenience. The book and CD-ROM EMS manual based on the ISO 14001:2004 series of standard with samples of policy statements, objectives, targets, and programs will enable the users to amend or adopt them without reinventing the wheel and losing time.

The CD-ROM also includes standard operating procedures; they are made available so that customers can input them into their computer and use their own Microsoft Word® program to edit and print these documents. The contents of the procedures are written in simple and precise language to be in compliance with the elements of the amended ISO 14001:1996 standard to the ISO 14001:2004 series of standards in November 2004. The book aims to minimize the number of documents and to avoid the nightmare of management representative at the time of certification. The standard operating procedures refer exclusively to the documents especially required for compliance; however, specific formats are included to ensure that the soft copy can be easily used worldwide with a diversified range of industries and organizations.

Environmental Management System ISO 14001:2004: Handbook of Transition with CD-ROM is primarily written in a global context and can be applied to any process-related industry or organization interested in environmental compliance. The documents provided in the text, however, can be applied to any regulated or nonregulated industry. Some of the reasons for purchasing this book would be as follows:

- Reducing the difficulty of translating the revised ISO 14001:1996 standard to ISO 14001:2004 requirements into action.
- Provides readers and frontline management all the information they need to know to make a successful documented EMS based on the ISO 14001:2004 series of standards implemented from November 2004, which has acquired global acceptance to overcome international trade barriers.
- Simple, concise, and easy-to-use reference tool covering the basic concepts and elements described in the applicable ISO 14001:2004 series of standard.
- The text and the software are valuable time-savers for those companies that are in a process of writing and organizing the documentation for certification and the purpose of further improvement.
- The manual and procedures provided in the CD-ROM can be easily tailored to incorporate changes to add organizational requirements.
- The manual and procedures provide stepwise guidance on how to develop and implement the system.
- Explicit working formats are provided to execute impact analysis and management review, identify aspects of significant environmental impacts based on applicable international and local legislations, provide priority rating to aspects of significant impacts,

define policies, objective and targets, develop programs, and establish emergency preparedness, thus reducing the anxiety of middle management to defining EMS-related terminologies.

- Examples of EMS polices, targets, objectives, and programs.
- A practical help chapter is provided with virtually filled forms for customer convenience as to how to use the attachment.

Below is a list of potential primary and secondary users who may benefit from the handbook of EMS:

- Pharmaceutical industry
- Medical device industry
- All consumer products manufacturers
- All process-related industries
- Packaging material manufacturers
- Bulk raw materials manufacturers
- Electronic component manufacturers
- Food items manufacturers
- Healthcare management organizations
- Pharmacies
- Mechanical equipment manufacturers
- Hi-tech equipment manufacturers
- Tourism industry
- Servicing organizations
- R&D laboratories
- Hospitals
- Inspection and testing laboratories
- Chemical manufacturers
- Nuclear facilities

Objectives: This section describes the background of the ISO series of standards and their development and basic changes in the ISO 14001:2004 international standard. It also provides a timeline chart and documentation and describes the registration/certification process.

EMS Manuals: Templates of the EMS manual provided as a model can be directly adopted by a company planning for the first time for registration/certification to an international standard ISO

14001:2004 or planning for transition to an ISO 14001:2004 company in possession of the ISO 14001:1996 registration/certification that intends to revise its EMS manual.

Standard Operating Procedures: This provides 22 template procedures that can be adopted after minor changes suitable to each company's operations.

The Practical Help: Provides 28 explicit attachments to be used as a guide and 31 examples of attachments filled in for customers' convenience.

Manual Format

Your Company Name: At the top of each page of the quality manual, space is provided to enter the company name.

EMS System Manual: The EMS manual assigns a space to indicate the standard used to document the quality management system.

Manual Serial Number: The EMS manual is assigned a unique number that appears at the upper right-hand corner of each page.

Revision Number: At the right-hand corner of each page is the revision number box, which is provided to document the revision number.

Written by: The EMS manual provides space for the author name, title, and the department with signatures and the date.

Checked by: The EMS manual is assigned a space to provide the name of the person responsible for the verification of the contents of the manual, the title, and the department with signatures and the date.

Approved by: Each page of the EMS manual has a space to provide the name, title, and department of the person in the quality assurance unit or the management representative approving the manual with signatures and the date.

Date Supersedes: Each page of the EMS manual allocates a space to indicate the issue date of the manual superseded.

Date Issued: Each page of the EMS manual is provided with a space to provide the manual's issue date.

Distributed to: Each top page of the EMS manual has a space bar to indicate the recipients of the manual.

Controlled Copy Number: Each front page of the EMS manual is assigned a space to provide the copy number assigned to the manual for distribution.

Section Clauses: Each page of the EMS manual has a box to indicate the section and the applicable clause.

Reasons for Revision: On the top page of the EMS manual, space is provided to describe the reasons for revision of the procedure with the date.

Reference SOP Number: On the last page of each clause described in the EMS manual, space is provided to write the applicable SOP number.

SOP Format

All SOPs have been designed and formatted to have the same look, and similar information is located in the same place on all SOPs. Information common to all SOPs is described below.

Your Company Name: At the top of each page of an SOP, space is provided to enter the company name.

Subject: The subject of each SOP appears at the upper left-hand corner of the SOP and describes the quality element described in the SOP.

SOP Number: Each SOP is assigned a unique number that appears at the upper right-hand corner of the SOP based on the reference clause of the ISO 14001:2004 series of standard.

Corresponding Clause: All SOPs are provided with a space in the second line of the SOP's header to provide reference to the corresponding clause of international standard ISO 14001:2004.

Distributed to: Each SOP has a space to list the recipients of the SOP.

Based on: Each SOP is provided with a space to list the applicable ISO14001:2004 series of standard.

Revision Number: At the right-hand corner of each page is the revision number box. The box is provided to document the revision number.

Written by: Each SOP has dedicated space to provide the author's name, title, and department with signatures and the date.

Checked by: Each SOP is provided with a space to provide the name of the person responsible for the verification of the procedure, title, and department with signatures and the date.

Approved by: Each page of the SOP has a space to provide the name, title, and department of the person in the quality assurance unit or the management representative approving the SOP with signatures and the date.

Date Supersedes: Each page of the SOP has space to indicate the issue date of the SOP superseded.

Date Issued: Each page of the SOP has a space to provide the SOP issue date.

Page Number: Each SOP page is numbered.

Purpose: Each SOP is supported with reasons, describing the purpose of that SOP.

Responsibility: Each SOP is supported with responsibility, describing the department and the employee responsible for implementing the procedure.

Definition: Where necessary, definitions are provided in the SOP for better understanding.

Procedure: Following the responsibility statement are the individual steps of the SOP. These are arranged in a logical order and numbered on the ISO 14001:2004 series of standards.

Reasons for Revision: At the end of each SOP, space is provided to describe the reasons for the revision of the procedure with the date.

CD-ROM: An electronic copy of the EMS manual and SOPs are provided.

Disclaimer

Every effort has been made to ensure that the contents of the ISO 14001:2004 EMS Manual are accurate and that the recommendations are appropriate and made in good faith. The author accepts no responsibility for inaccuracies or actions taken by companies subsequent to these recommendations.

The similarity in the contents with a particular reference may be incidental due to likenesses in principle.

100.10-1

Objective

After the series of avoidable environmental catastrophes such as Bhopal, Chernobyl, and Exxon, there has been a continuous increase in public anxiety as it is really difficult to define all of the factors promoting change in the environment. However, it is clear that the solution to control the environment is only possible at the corporate level and public awareness.

As the public and regulatory concern grows for maintaining and improving the quality of the environment and protecting human health, organizations of all sizes are increasingly focusing their attention to the significant environmental impacts of their activities, products, or services. The environmental performance of an organization is of increasing importance to internal and external interested parties. The sound environmental performance achievement requires organizational commitment to a structured approach and to continual improvement of the Environmental Management System (EMS) ISO 14000:2004.

The ISO 14001:2004 is the only standard, which contains requirements that may be objectively audited for certification registration purpose or for self-declaration purposes. An EMS provides order and consistency for an organization to address environmental concerns through the allocation of resources, assignment of responsibilities, and ongoing evaluation of practices, procedures, and processes.

Following the global recognition of ISO 9000 in 1993, the European committee for standardization and the International Standard Organization made an agreement for the development of standards for environmental management and performance. The task was begun with the initiation of standards ISO 14000, ISO 14001, and ISO 14040 in 1996. The ISO 14000 series of standards include:

ISO 14001:	EMS specification with guidance for use
ISO 14001:	Environmental Management System—General guidance on principles, systems, and supporting technique
ISO 1410-12:	Guidelines for environmental auditing
ISO 14010:	General principles of environmental auditing
ISO 14011:	Auditing procedures
ISO 14012:	Qualification criteria for environmental auditors

ISO 14020:	Labeling standards
ISO 14030:	Environmental performance standards
ISO 14040:	Life cycle assessment standards
ISO 14050:	Environmental management vocabulary
ISO 9000:2000:	Quality management systems—Fundamental and vocabulary
ISO 9001:2000:	Quality management systems—Requirements
ISO 14004:2004:	Environmental management systems—General guidelines on principles, systems, and support techniques
ISO 19011:2002:	Guidelines for quality and/or environmental management systems auditing
ISO 9001:2008:	Revised quality management system

On November 15, 2004, the International Organization for Standardization (ISO) issued the second editions of ISO 14001 and ISO 14004. This revision to the standards is part of ISO's commitment to periodically review and update each standard and concludes more than three years' work by the ISO Technical Committee (TC207) responsible for their development and maintenance.

According to the introduction to ISO 14001, "The second edition of this International Standard is focused on clarification of the first edition, and has taken due consideration of the provisions of ISO 9001 to enhance the compatibility of the two standards for the benefit of the user community." Although every clause and sub-clause of the 1996 version has undergone some level of revision, most of the changes are minor adjustments in terminology for clarification purposes. In most cases, a system correctly implemented and in conformance with the certification requirements will need only minor changes to conform to the new version of the standard.

The first general change is that, throughout the document, the phrase "establish and maintain a procedure" has been changed to "establish, *implement* and maintain a procedure." Organizations that have sought certification of their EMS have always had to demonstrate implementation of their systems in order to become certified and this will not result in any change to the auditor's approach. This change in wording will likely have little impact in any case, except possibly where an organization has self-declared the existence of an EMS and where actual implementation of the system may be weak.

Another general change is the elimination of almost all specific requirements for a "documented procedure." In fact, the only place where this requirement is still stated is in clause 4.4.6 (operational control) and even there it is modified by "... to control situations where their absence could

lead to deviation from the environmental policy, objectives and targets," as it did in the 1996 version. Another remaining reference to procedural documentation exists in the definition of internal audit (3.14), which states that an audit is a "...documented process...." Even with this elimination of references to documented procedures, however, documentation remains important to the establishment and maintenance of the EMS. This is evident in 4.1, which requires that the organization "...establish, *document*, implement, maintain and continually improve an environmental management system..." where "document" is an addition to this clause since the 1996 version. Generally though, the new wording of the requirements allows the organization greater flexibility in determining where and at what level documentation should be developed. Despite these changes in language, the position of auditors will change little. Although we can no longer require documented procedures as defined in some of the elements of the 1996 standard, we will continue to expect documentation, in one form or another, wherever it is necessary to ensure consistent structure and implementation of the EMS.

It is true that over the past 100 years there has been significant pollution of the environment by many industrial units and has led to the pollution in several ways such as:

- Air pollution
- Ozone depletion
- Soil pollution
- Increase level of CO₂
- Underground water pollution
- Global warming
- Acid rain
- Noise pollution
- Excretion of toxic waste

The answer to adoption of the industrial units to ISO 14001:2004 EMS can be simply explained as prevention of population besides many other benefits such as:

- No international trade barriers
- Zero accidents
- Regulatory compliance local and international
- Operational cost saving
- Healthy and safe work environment at the site
- Reduction of penalties due to local legislations

- Reduction of waste generation and disposal cost
- Energy conservation
- Reduction of raw material/resource usage
- Marketing edge over the competitors
- Improved company credibility
- Reduction in insurance premiums
- Uninterrupted operations
- Good public opinion
- Improved process efficiency

The standard operating procedures (SOPs) became very popular in the late 1970s with the development of good laboratory practices (GLPs) regulations, and since then the US Environmental Protection Agency (EPA) also considers SOPs as an essential tool to demonstrate the documented procedures that lead to subjective environmental compliance evidence. SOPs help management evaluate adequacy through

- Historical records
- Audits from environmental agencies
- Internal audits

Development of EMS and applicable SOPs is an enormous task, and the staff often experience difficulty with certain ISO 14001:2004 requirement, especially those concerning the establishment and assigning a numerical value to an aspect of major environmental concern within an organization development of complete set of SOPs and data record keeping.

The *Environmental Management System (EMS) Manual and Standard Operating Procedures* formats based on ISO 14001: 2004 series of standard provide explicit 22 essential information, which can be tailored to make it your own system without reinventing the wheel, paying heavy consultation fees, and going through enormous painstaking job of using selective language to describe your system.

Your company can personalize your own documentation system. The documentation is provided on a CD-ROM (ISO 14001:2004 COMPLIANCE MANUAL), which can be opened on your personal computer.

Herein is the electronic documentation CD-ROM required to help comply with ISO 14001:2004 series of standard. The CD includes template *Environmental Management System Manual* based on the ISO 14001:2004 standard and 21 SOPs describing the elements to be in compliance with the EMS requirements.

Environmental Management Systems Manual and Standard Operating Procedures on the CD (ISO 14001:2004 COMPLIANCE PACK) are valuable tools for a company intending to improve documentation control and getting certified. The Manual and SOPs are especially relevant to environmental personnel and documenting managers, operational personnel, designers, engineers, field engineers, and anyone interested in developing or improving environmental documentation practices.

The *Environmental Management System Manual and Standard Operating Procedures* are provided in an electronic form on a CD for convenience. These are made available so that one can import them into a computer and use Microsoft Word program to incorporate changes and print these documents.

We are convinced that you will find these electronic *Environmental Management System Manual and Standard Operating Procedures* a valuable time and money saver.

100.10-2

Definitions Used

Without normative references, environment is defined as surrounding in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation.

The definition of surrounding in the context may be extended from within an organization to the global system. There are no references present; however, the following definitions include seven new definitions marked “N” and a number of changes to the existing definitions. The definitions changed from ISO 14001:1996 to ISO 14001:2004 are marked “C” within parentheses.

Continual improvement (C)

A process of enhancing the environmental management system to achieve improvements in overall environmental performance in line with the organization’s environmental policy.

Corrective action (N)

Action to eliminate the cause of a detected nonconformity.

Document (N)

Information and its supporting medium.

Environment

Surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation.

Environmental aspect

Element of an organization’s activities, products, or services that can interact with environment.

Environmental impact

Any change to the environment, whether adverse or beneficial, wholly or partially, resulting from an organization’s activities, products, or services.

Environmental management system (C)

The part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy.

Environmental management system audit

A systematic and documented verification process of objectively obtaining and evaluating evidence to determine whether an organization's environmental management system conforms to the environmental management system audit criteria set by the organization and for communication of the results of this process to management.

Environmental objectives (C)

The overall environmental goal, arising from the environmental policy, that an organization sets itself to achieve and which is quantified where practicable.

Environmental performance (C)

Measurable results of the environmental management system, related to an organization of its environmental aspects based on its environmental policy objective and targets.

Environmental policy

Statement by the organization of its intentions and principles in relation to its overall environmental performance, which provides a framework for action and for the setting of its environmental objectives and targets.

Environmental target

Detailed performance requirement quantified where practicable, applicable to the organization or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.

Internal audit (N)

Systematic, independent, and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the environmental management system audit criteria set by the organization are fulfilled.

Interested party

Individual or group concerned with or affected by the environmental performance of an organization.

Nonconformity (N)

Nonfulfillment of a requirement.

Organization

Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether in corporate or not, public or private, that has its own functions and administration.

Preventive action

An action to eliminate the cause of a potential nonconformity.

Procedure

A specified way to carry out an activity or a process.

Record

Document stating results achieved or providing evidence of activities performed.

Prevention of pollution (C)

Use of processes, practices, materials, or products that avoid, reduce, or control pollution, which may include recycling, treatment, process changes, control mechanisms, efficient use of resources and material substitution.

100.10-3

Correspondence between ISO 14001:1996 and ISO 14001:2004

On November 15, 2004, the International Organization for Standardization (ISO) issued the second editions of ISO 14001 and ISO 14004. This revision to the standards is part of ISO's commitment to periodically review and update each standard and concludes more than three years work by the ISO Technical Committee (TC207) responsible for their development and maintenance.

According to the introduction to ISO 14001, "The second edition (ISO 14001:2004) of this International Standard is focused on clarification of the first edition, and has taken due consideration of the provisions of ISO 9001 to enhance the compatibility of the two standards for the benefit of the user community." Although every clause and subclause of the 1996 version has undergone some level of revision, most of the changes are minor adjustments in terminology for clarification purposes. In most cases, a system correctly implemented and in conformance with the certification's requirements will need only minor changes to conform to the new version of the standard.

Although the majority of the changes to the standard are very minor, there are a few places where the shift in meaning may be more significant, depending on the organization and management system involved. A summary of these follows.

Significant Changes to the Standard and What They Mean

Section 3 of the standard includes seven new definitions and a number of changes to the existing definitions. The seven new definitions include:

- Corrective action
- Document
- Internal audit**
- Nonconformity
- Preventive action
- Procedure
- Record

The definitions that have changed include:

- Continual improvement
- Environmental management system
- Environmental objective
- Environmental performance**
- Prevention of pollution

Of the changed and new definitions, two are significant:

Internal audit—The definition of internal audit is significant in two aspects. The definition specifically states that this is an “independent and documented” process. Independence is always a good idea in an audit program but previously this was not emphasized for internal audits of an EMS. In conjunction with the requirement in clause 4.5.5 that “selection of auditors and conduct of audits shall ensure objectivity and the impartiality of the audit process,” this represents one of the most significant changes to the requirements of the standard. The inclusion of the requirement for the process to be documented is a departure from the general elimination of any specific requirement for “documented procedures” from the standard. Although this documented process may not be considered a formal “procedure” within the EMS, we will be looking for essentially the same thing.

Environmental performance—This term is now much more clearly defined as “measurable results of an organization’s management of its environmental aspects.” This is particularly important in enhancing clauses 4.4.1.b with respect to the responsibilities of the management representative, 4.5.1 with respect to the monitoring of performance, and 4.6 in defining information to be considered during management review.

4.1 The addition to 4.1 requiring the organization to “... define and document the scope of its environmental management system” will help organizations clearly understand the boundaries of their EMS. All organizations seeking to have their EMS certified have had to identify the scope of the EMS, often in cooperation with their certification body. This requirement may help organizations be better prepared initially and better able to maintain focus as they improve their system.

4.2 The policy commitment to comply with “environmental legislation and regulations” has been clarified to read “a commitment to comply with applicable legal requirements ... which relate to its environmental aspects.” This should help to define specifically which legal requirements fall within the scope of the EMS. Although this clarification will not substantially change the way in which the auditors will assess the issue, organizations may find it easier to be prepared.

4.3.1.a The clarification "... within the defined scope of the environmental management system ..." will help organizations and auditors to focus on identifying aspects only within the defined scope of the EMS. While this has always been the interpretation, the better definition of the scope required in 4.1 will help to reduce the confusion regarding the inclusion of environmental aspects at the margins of the organization, facility, or EMS.

4.3.1.a The requirement for an organization to identify its environmental aspects has been strengthened by the addition of the phrase "... taking into account planned or new developments, or new or modified activities, products and services ..." Although this has always been implied, the lack of clarity has led to some weaknesses in EMS implementation. While this will not alter the way in which the auditors perform the audit, it does give them more justification when identifying weaknesses in this area.

4.3.2 A requirement has been added to 4.3.2 stating that the organization must "determine how [legal and other] requirements apply to its environmental aspects." Not only will this help organizations to understand how legal requirements relate to their system, but it will also help to align these requirements with operational controls and performance monitoring. This will not have any significant impact on how this clause is audited.

4.4.1.b In refining the role and responsibility of the management representative, 4.4.1.b has added the specific responsibility for "reporting to top management on ... recommendations for improvement." This means auditors will now be looking for the management representative to be active in developing and/or gathering recommendations for improvement. Whereas ideas for improvement of the system may still come from virtually any source and may have multiple points of entry into the system, this establishes an important link between the day-to-day operation of the management system and management review, which has been strengthened in 4.6.

4.4.2 The addition of the phrase "person(s) performing tasks for it *or on its behalf*" strengthens and broadens the requirements for competence, training, and awareness to include contractors, service providers, and other parties that may operate on the organization's behalf. Previously, this clause of the standard was often interpreted as applying only to employees of the organization, with the activities of other parties controlled only under 4.4.6, operational controls. The auditors will expect to see the organization better identify those individuals or organizations operating on its behalf, whose work can have a significant impact on the environment, and describe how their competence is ensured.

4.4.4 The management system documentation clause now describes in more detail the minimum documentation expected in the system. Of particular interest are the description of the scope of the EMS and the requirement for "documents including records, determined by the organization to be necessary to ensure the effective planning, operation and control of processes that relate to its significant environmental aspects."

The term “core elements” has been replaced by “main elements,” which may not provide much in the way of clarification. However, the Annex (A.4.4) now provides better assistance in determining the appropriate level of documentation. These changes will not alter the way in which the auditors will assess this element.

4.4.5 The changes to clause 4.4.5 have brought clearer and more practical wording. The only significant changes are the clarification of the relationship between documents and records and the addition of 4.4.5.f, concerning documents of external origin. Both of these issues, however, were implied in the 1996 version of the standard and this will not result in any significant change to the way auditors assess document control.

4.5.2.1 The requirement for the organization to monitor its compliance with applicable legal requirements has been moved into its own sub-clause to add emphasis and now further requires the organization to “... keep records of the results of the periodic compliance evaluations.” While the auditors have always sought these records, this clarification will give them a stronger foundation for doing so.

4.5.2.2 The 1996 version of the standard required a policy commitment to “... other requirements to which the organization subscribes,” but there was no clear indication of how this commitment would be supported in the other requirements of the standard. The inclusion of clause 4.5.2.2 in the 2004 version corrects this oversight with the requirement that the organization “evaluate compliance with other requirements to which it subscribes.” The auditors will now seek evidence of a periodic evaluation of compliance with these “other requirements” and appropriate follow-up and corrective action whenever a nonconformity is identified.

4.5.3, 4.5.4, and 4.5.5 are all renumbered from the original 4.5.2, 4.5.3, and 4.5.4, respectively, as a result of the addition of the new 4.5.2 for evaluation of compliance. Although this change has no technical significance, it may result in misalignment of some manuals and other system documents modeled on the 1996 version.

4.5.3 Changes to the clause for nonconformity, corrective action, and preventive action include specific requirements for (d) “recording the results of corrective action(s) and preventive action(s) taken,” and (e) “reviewing the effectiveness of corrective action(s) and preventive action(s) taken.” In order to demonstrate sufficient evidence to support certification, these requirements have always been implied so there will be no significant change in the way these clauses are audited.

4.5.4 Within the records requirements, the addition of the requirement to “... maintain records as necessary to demonstrate ... the results achieved” is a change in keeping with the overall shift toward performance-based management of the system. This change will be of particular interest to auditors in association with the revised definition of environ-

mental performance, where we will be looking for records of the results of the organization's management of its environmental aspects.

4.5.5 The most significant change to the internal audit requirements is the addition of the requirement that "selection of auditors and conduct of audits shall ensure objectivity and the impartiality of the audit process." As noted above, in association with the new definition of "internal audit," this new requirement for independence of internal auditors is one of the most significant changes to the specific requirements of the standard. The auditors will now be looking for this independence in the planning and execution of internal audits.

4.6 Of the revised clauses of ISO 14001, one of the most significantly changed is the management review clause, 4.6. While the framework and stated intent of the management review have remained the same, the standard now identifies specific inputs and outputs. The specific inputs now additionally include:

- Communications from external interested parties
- Environmental performance
- Complaints
- Follow-up from previous reviews
- Recommendations for improvement
- Developments in legal requirements

Among the most significant of these additions are environmental performance and recommendations for improvement. The organization will now need to be able to identify specific measures of environmental performance, maintain records, and make a judgment as to whether the existing levels of performance are acceptable. Together with the requirement for recommendations for improvement, management review should, in many cases, become much more productive.

Revisions to this clause also include more clearly defined outputs, including specifically "... decision and actions related to possible changes ..." the auditors will expect to see these decisions and actions in response to the reported levels of environmental performance and the recommendations for improvement, as well as in response to other inputs, as appropriate.

Annex A It has also been revised and now provides much better direction, clarification, and guidance for organizations implementing and maintaining their environmental management systems. Of particular interest are the sections on the environmental review (A1), identification of aspects (A.3.1), objectives, targets, and programs (A.3.3), documentation (A.4.4), and monitoring and measurement (A.5.1).

100.10-4

Correspondence between ISO 9001:2008 and ISO 14001:2004

ISO 9001:2008		ISO 14001:2004	
Introduction (title only)		Introduction	
General	0.1		
Process approach	0.2		
Relationship with ISO 9004	0.3		
Compatibility with other management system	0.4		
Scope (title only)	1	1	Scope
General	1.1		
Application	1.2		
Normative references	2	2	Normative references
Terms and definitions	3	3	Terms and definitions
Quality management system (title only)	4	4	Environmental management system requirements (title only)
General requirements	4.1	4.1	General requirements
Documentation requirements (title only)	4.2		
General	4.2.1	4.4.4	Documentation
Quality manual	4.2.2		
Control of documents	4.2.3	4.4.5	Control of documents
Control of records	4.2.4	4.5.4	Control of records
Management responsibility (title only)	5		
Management commitment	5.1	4.2	Environmental policy
		4.4.1	Resources, roles, responsibility, and authority
Management representative	5.5.2	4.4.1	Resources, roles, responsibility, and authority
Customer focus	5.2	4.3.1	Environmental aspects
		4.3.2	Legal and other requirements
		4.6	Management review
Quality policy	5.3	4.2	Environmental policy
Planning (title only)	5.4	4.3	Planning (title only)

continued

ISO 9001:2008			ISO 14001:2004
Quality objectives	5.4.1	4.3.3	Objectives, targets, and program(s)
QMS planning	5.4.2	4.3.3	Objectives, targets, and program(s)
Responsibility, authority, and communication (title only)	5.5		
Responsibility and authority	5.5.1	4.1	General requirements
		4.4.1	Resources, roles, responsibility, and authority
Management representative	5.5.2	4.4.1	Resources, roles, responsibility, and authority resources, role
Internal communication	5.5.3	4.4.3	Communication
Management review (title only)	5.6	4.6	Management review
General	5.6.1	4.6	Management review
Review input	5.6.2	4.6	Management review
Review output	5.6.3	4.6	Management review
Resource management (title only)	6		
Provision of resources	6.1	4.4.1	Resources, roles, responsibility, and authority
Human resources (title only)	6.2		
General	6.2.1	4.4.2	Competence, training, and awareness
Competence, training, and awareness	6.2.2	4.4.2	Competence, training, and awareness
Infrastructure	6.3	4.4.1	Resources, roles, responsibility, and authority
Work environment	6.4		
Product realization (title only)	7	4.4	Implementation and operation (title only)
Planning of product realization	7.1	4.4.6	Operational control
Customer-related processes (title only)	7.2		
Determination of requirements related to the product	7.2.1	4.3.1	Environmental aspects
		4.3.2	Legal and other requirements
		4.4.6	Operational control
Review of requirements related to the product	7.2.2	4.3.1	Environmental aspects
		4.4.6	Operational control
Customer communication	7.2.3	4.4.3	Communication
Design and development (title only)	7.3		
Design and development planning	7.3.1	4.4.6	Operational control
Design and development inputs	7.3.2	4.4.6	Operational control

ISO 9001:2008		ISO 14001:2004	
Design and development outputs	7.3.3	4.4.6	Operational control
Design and development review	7.3.4	4.4.6	Operational control
Design and development verification	7.3.5	4.4.6	Operational control
Design and development validation	7.3.6	4.4.6	Operational control
Control of design and development changes	7.3.7	4.4.6	Operational control
Purchasing (title only)	7.4		
Purchasing process	7.4.1	4.4.6	Operational control
Purchasing information	7.4.2	4.4.6	Operational control
Verification of purchased product	7.4.3	4.4.6	Operational control
Production and service provision (title only)	7.5		
Control of production and service provision	7.5.1	4.4.6	Operational control
Validation of processes for production and service provision	7.5.2	4.4.6	Operational control
Identification and traceability	7.5.3		
Customer property	7.5.4		
Preservation of product	7.5.5	4.4.6	Operational control
Control of monitoring and measuring equipment	7.6	4.5.1	Monitoring and measurement
Measurement, analysis, and improvement (title only)	8	4.5	Checking (title only)
General	8.1	4.5.1	Monitoring and measurement
Monitoring and measurement (title only)	8.2		
Customer satisfaction	8.2.1		
Internal audit	8.2.2	4.5.5	Internal audit
Monitoring and measurement of processes	8.2.3	4.5.1	Monitoring and measurement
		4.5.2	Evaluation of compliance
Monitoring and measurement of product	8.2.4	4.5.1	Monitoring and measurement
		4.5.2	Evaluation of compliance
Control of nonconforming product	8.3	4.4.7	Emergency preparedness and response
		4.5.3	Nonconformity, corrective action, and preventive action
Analysis of data	8.4	4.5.1	Monitoring and measurement
Improvement (title only)	8.5		

continued

ISO 9001:2008		ISO 14001:2004	
Continual improvement	8.5.1	4.2	Environmental policy
		4.3.3	Objectives, targets, and program(s)
		4.6	Management review
Corrective action	8.5.2	4.5.3	Nonconformity, corrective action, and preventive action
Preventive action	8.5.3	4.5.3	Nonconformity, corrective action, and preventive action

100.10-5

Correspondence between ISO 14001:2004 and ISO 9001:2008

ISO 14001:2004		ISO 9001:2008	
Introduction			Introduction (title only)
		0.1	General
		0.2	Process approach
		0.3	Relationship with ISO 9004
		0.4	Compatibility with other management systems
Scope	1	1	Scope (title only)
		1.1	General
		1.2	Application
Normative references	2	2	Normative references
Terms and definitions	3	3	Terms and definitions
Environmental management system requirements (title only)	4	4	Quality management system (title only)
General requirements	4.1	4.1	General requirements
		5.5	Responsibility, authority and communication (title only)
		5.5.1	Responsibility and authority
Environmental policy	4.2	5.1	Management commitment
		5.3	Quality policy
		8.5.1	Continual improvement
Planning (title only)	4.3	5.4	Planning (title only)
Environmental aspects	4.3.1	5.2	Customer focus
		7.2.1	Determination of requirements related to the product
		7.2.2	Review of requirements related to the product
Legal and other requirements	4.3.2	5.2	Customer focus
		7.2.1	Determination of requirements related to the product

continued

ISO 14001:2004		ISO 9001:2008	
Objectives, targets, and program(s)	4.3.3	5.4.1	Quality objectives
		5.4.2	Quality management system planning
		8.5.1	Continual improvement
Implementation and operation (title only)	4.4	7	Product realization (title only)
Resources, roles, responsibility, and authority	4.4.1	5.1	Management commitment
		5.5.1	Responsibility and authority
		5.5.2	Management representative
		6.1	Provision of resources
		6.3	Infrastructure
		6.2.1	(Human resources) General
Competence, training, and awareness	4.4.2	6.2.2	Competence, training, and awareness
Communication	4.4.3	5.5.3	Internal communication
		7.2.3	Customer communication
Documentation	4.4.4	4.2.1	(Documentation requirements) General
Control documents	4.4.5	4.2.3	Control of documents
Operational control	4.4.6	7.1	Planning of product realization
		7.2	Customer-related processes (title only)
		7.2.1	Determination of requirements related to the product
		7.2.2	Review of requirements related to the product
		7.3.1	Design and development planning
		7.3.2	Design and development inputs
		7.3.3	Design and development outputs
		7.3.4	Design and development review
		7.3.5	Design and development verification
		7.3.6	Design and development validation
		7.3.7	Control of design and development changes
		7.4.1	Purchasing process
		7.4.2	Purchasing information
7.4.3	Verification of purchased product		
7.5	Production and service provision (title only)		
7.5.1	Control of production and service provision		
7.5.2	Validation of processes for production and service provision		

ISO 14001:2004		ISO 9001:2008	
		7.5.5	Preservation of product
Emergency preparedness and response	4.4.7	8.3	Control of nonconforming product
Checking (title only)	4.5	8	Measurement, analysis, and improvement (title only)
Monitoring and measurement	4.5.1	7.6	Control of monitoring and measuring equipment
		8.1	(Measurement, analysis, and improvement) General
		8.2.3	Monitoring and measurement of processes
		8.2.4	Monitoring and measurement of product
		8.4	Analysis of data
Evaluation of compliance	4.5.2	8.2.3	Monitoring and measurement of processes
		8.2.4	Monitoring and measurement of product
Nonconformity, corrective action, and preventive action	4.5.3	8.3	Control of nonconforming product
		8.4	Analysis of data
		8.5.2	Corrective action
		8.5.3	Preventive action
Control of records	4.5.4	4.2.4	Control of records
Internal audit	4.5.5	8.2.2	Internal audit
Management review	4.6	5.1	Management commitment
		5.6	Management review (title only)
		5.6.1	General
		5.6.2	Review input
		5.6.3	Review output
		8.5.1	Continual improvement

100.10-6

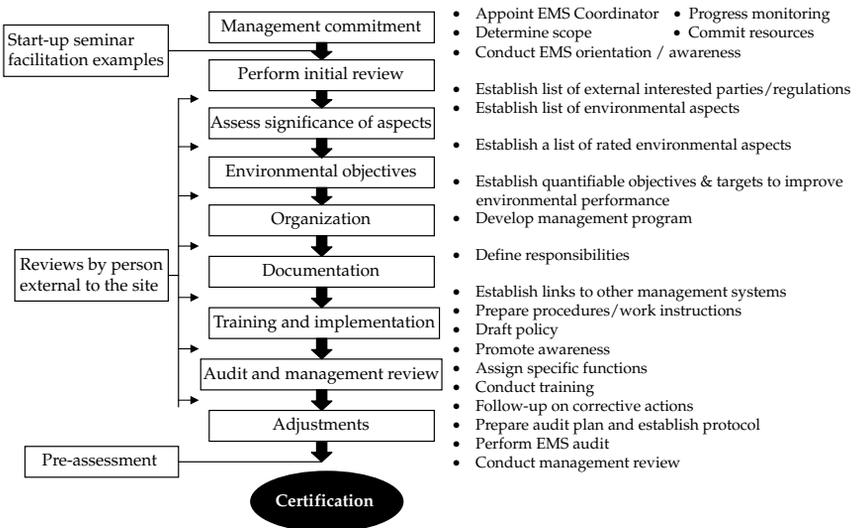
Certification

The key steps involved in the development of the Environmental Management System (EMS) for certification involves the following steps:

- Environmental impact analysis/management review
- Identify the aspect of significant adverse impact on environment
- Set improvement objectives/set targets
- Implement improvement program
- Implement control procedures that may generate positive aspects
- Conduct education and training
- Implement monitoring system
- Review your progress

The general implementation process is as follows:

General Implementation Process



The most difficult, expensive, and time-consuming part is the development of the EMS manual and the applicable standard operating procedures (SOPs). Enormous efforts are needed to establish the following:

- Policy
- Identification of aspects/impacts
- Regulatory requirements
- Setting objectives
- Identifying roles and responsibilities
- Training
- Communication
- Documentation
- Document control
- Operational control
- Emergency procedure
- Monitoring
- Nonconformance
- Records
- Audits
- Management review

Among others, the most time-consuming part is the study of significant aspects and their impacts on the environment defining objectives and targets and the program to monitor and control the EMS. The formats provided in the applicable SOPs can be used directly after entering the applicable legislation and your own process-related requirements and the results of the environmental impact analysis performed in house or by the outside agencies. The key documents involved are the local legislation requirements, which can be obtained from the regulatory agency of the concerned country.

The certification is a two-step process.

Step One

- Management review/impact analysis
- Develop environmental policy
- Writing EMS manual
- Writing of SOPs

Step Two

- Implementation of procedures (SOPs)
- Certification
- Surveillance

The total time involved in accomplishing steps one and two varies from company to company; however, the most time-consuming and

expensive step is the writing of the EMS manual and SOPs, which might take from 9 to 12 months, followed by implementation and training of staff, which as a rule requires a minimum of three months, to invite any certification body for assessment of your system. For the life cycle of documents development and certification, refer Tables 1 and 2, respectively.

All audits must be carried out referring to the new standard and all existing certificates must be transitioned to the new standard.

The assessment to comply with the new version can be arranged, either through preliminary assessment work or by adding time to the existing planned audits.

Table - 1
Documentation development process flow diagram

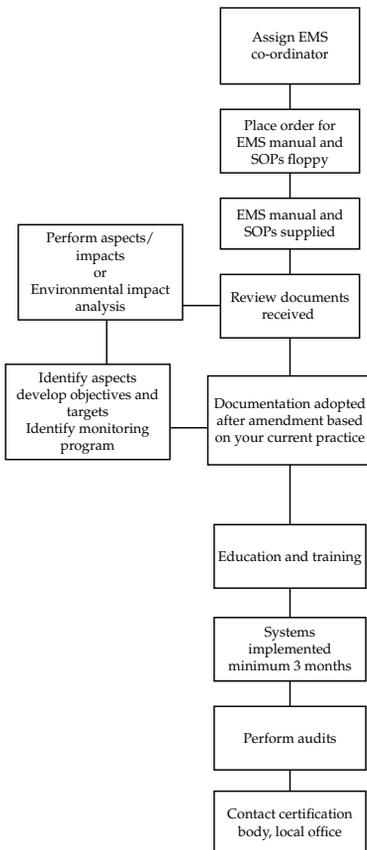
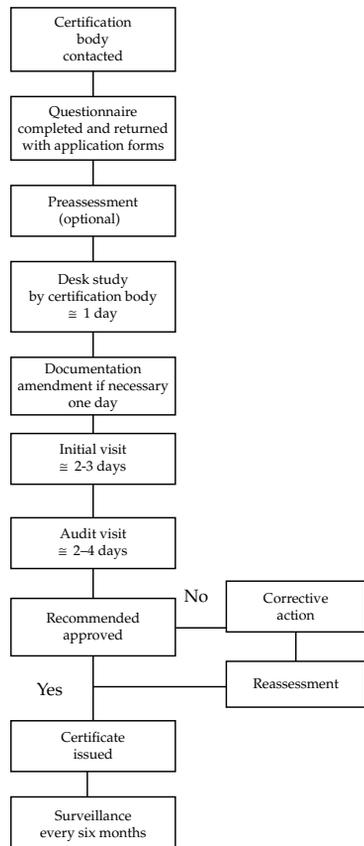


Table - 2
Assesment process flow diagram



If you already have a certified management system For most organizations, the revisions will require one to carry out some reviews of the system documentation and processes, verify the ongoing compliance in those areas subject to change and clarification, and make changes as necessary to align the EMS to the new standard.

Follow these steps to upgrade the EMS:

1. Identify gaps and needed changes. To assist in this process, follow the checklist provided under Section 100.10.3, which should be useful to assess the changes and review the need to take any action.
2. Define the transition team.
3. Establish the transition schedule.
4. Train the transition team and internal auditors.
5. Upgrade the EMS.
6. Run one cycle of internal audits, corrective actions, and management review.
7. Conduct preaudit.
8. Proceed with the certification against ISO 14001:2004.

If you are working toward first certificate For companies seeking certification of an EMS for the first time, the EMS should be developed based on the ISO 14001:2004. If the EMS has already been largely developed according to the 1996 edition, the new requirements should be implemented in the EMS by following the steps as described above. A well-implemented EMS should meet the key requirements of both versions, since the fundamental requirements are the same.

200.20-1

Environmental Management Systems Manual

QUALITY ASSURANCE DEPARTMENT

ISO 14001:2004

**Prepared and Maintained in Accordance with
EN ISO 14001: 2004**

Written by	Checked by	Approved by
Date supersedes mm/dd/yyyy	Date issued mm/dd/yyyy	Manual serial no. EMS-1 Revision no.: 0

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Reasons for Revision

mm/dd/yyyy 1. First time issued for "Your Company Name."

YOUR COMPANY NAME HERE

Environmental Management Systems Manual		
GENERAL REQUIREMENTS	Section-1, Clause-4.1	Revision no.: 0
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: 1 of 1

General Requirements

The “Your Company Name” has established and maintained an environmental management system, the requirements of which are established and documented.

The Environmental Management System (EMS) provided the company: a structured process for the achievement of continual improvement in the long term.

- Provide your company profile.
- Explain the type of activities, processes, and products involved.
- Provide organization chart.

Although immediate reduction of adverse environmental impacts may not result, systems have enabled the organization to

- Establish an environmental policy appropriate to itself.
- Identify the environmental aspects arising from the organization’s past, existing or planned activities, products or services to determine the environmental impacts of significance.
- Identify the relevant legislative and regulatory requirements.
- Identify priorities and set appropriate environmental objectives and targets.
- Establish a structure and (a) program(s) to implement the policy and achieve objectives and targets.

YOUR COMPANY NAME HERE

Environmental Management Systems Manual		
GENERAL REQUIREMENTS	Section-1, Clause-4.1	Revision no.: 0
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: 1 of 1

- Facilitate planning, control, monitoring, corrective action, auditing, and review activities to ensure both that the policy are complied with and that the environmental management system remains appropriate.
- Be capable of adapting to changing circumstances.
- Indicate continuous improvement of the EMS.
- State how the organization will define the scope of the EMS.

Reference SOP—[Number—ESM-4.1, dated mm-dd-yyyy].

YOUR COMPANY NAME HERE

Environmental Management Systems Manual		
ENVIRONMENTAL POLICY	Section-1, Clause-4.2	Revision no.: 0
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: 1 of 4

Environmental Policy

[Environmental policy statement here]

[Should be by top management]

The management has defined the organizations environmental policy and has ensured that it includes a commitment to continual improvement and prevention of pollution is appropriate to the nature, scale, and environmental aspects and impacts of its activities, products, or services.

Includes a commitment to comply with applicable, relevant environmental legislations and legal regulations, which relate to its environmental aspects and with other requirements to which the organization is associated which provides the framework for setting and reviewing environmental objectives and targets:

The Environmental Management System (EMS) is documented, implemented, maintained, and communicated to all employees and is available to the public for information.

The environmental policy recognizes all activities, products, or services causing impacts on the environment. The “Your Company Name” is committed to

- Minimize any significant adverse environmental impacts of new developments through the use of the integrated environmental management procedures and planning.
- Development of environmental performance evaluation procedures and associated indicators.
- Embody life cycle thinking.

YOUR COMPANY NAME HERE

Environmental Management Systems Manual		
ENVIRONMENTAL POLICY	Section-1, Clause-4.2	Revision no.: 0
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- Design products in such a way to minimize their environmental impacts in production, use, and disposal.
- Prevent pollution, reduce waste and the consumption of resources (materials, fuel, and energy), and commit to recovery and recycling, as opposed to disposal where feasible.
- Education and training.
- Sharing environmental experience.
- Involvement of and communication with interested parties, in-house employees, contractors, trainees, and external personnels associated with the EMS.
- Work toward sustainable development.
- Encourage the use of EMS by suppliers and contractors.

Signature

Designation of the Head of the Company/Date

Three more additional examples are quoted. Adopt or amend the one applicable to the activities, processes, or products of your company.

YOUR COMPANY NAME HERE

Environmental Management Systems Manual		
ENVIRONMENTAL POLICY	Section-1, Clause-4.2	Revision no.: 0
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Environmental Policy

EXAMPLE-1**Manufacturing Company**

- All present and future operations will, as a minimum, comply with relevant environmental legislation and standards so as to prevent pollution.
- We will develop manufacturing processes with minimum environmental impact, particularly the production.
- We will educate, train, and motivate our employees, contractors (external persons), trainees and so forth to carry out their tasks in an environmentally responsible manner.
- An important long-term aim in our business development is to protect the environment during the whole of our product life cycle. We will do this by limiting negative environmental impact as far as practicable, and by maximizing the recyclability of components.
- We will periodically conduct environmental audits in order to continually improve our environmental performance.

Signature

Designation of the Head of the Company/Date

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Environmental Management Systems Manual		
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Environmental Policy

EXAMPLE-2

Manufacturing Company

Our business is about design and manufacture of air filtration systems for indoor climate control. Our competitive edge comes from the market’s awareness of the environmental performance of our products.

An important strategy in the long-term development of our business is protection of the environment during all stages of product life cycle including design, manufacture, use, and disposal. This means working to minimize negative environmental impact and to achieve as much as possible with limited environmental resources.

Therefore, we shall

- Comply with and follow up on the requirements of relevant laws and standards for environmental protection.
- Choose raw materials, materials, and processes with small negative environmental impact, to economize with resources and to decrease emissions and waste amounts.
- The air filtration units are made mainly of best technology available sheet, and we aim at decreasing the spill during manufacture. At least 90.0% of the materials used should be recyclable when the products are disposed off.
- Educate and motivate our staff, “external” persons to work with and assume responsibility for environmental issues.
- Perform environmental assessments when a process is changed.

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Environmental Management Systems Manual		
ENVIRONMENTAL POLICY	Section-1, Clause-4.2	Revision no.: 0
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- Have an open dialogue on environmental issues with our staff, customers, suppliers, and other stakeholders.
- Follow up on and set new targets for our environmental work on a regular basis to ensure a continuous decrease in environmental impacts.

The legal responsibility for the environmental impact of the operations lies with the general manager; each department manager, production manager and foreman is responsible within his/her scope of operation for the implementation of the environmental system.

Signature

Designation of the Head of the Company/Date

YOUR COMPANY NAME HERE

Environmental Management Systems Manual		
ENVIRONMENTAL POLICY	Section-1, Clause-4.2	Revision no.: 0
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Environmental Policy

EXAMPLE-3

Transport Company

- We will consider the environment as a factor in every business decision we make, and continually improve our performance.
- We will comply with all applicable regulations and laws.
- We will establish environmental management systems to keep us informed about the impact of all our operations, allowing us to achieve the most effective and cost-efficient improvements in performance.
- We are committed to publishing targets for continual improvement in performance, and will work toward these with annual action plans.
- We will reduce the impact of our transport operations by maximizing the efficiency of our routes and vehicles, reviewing our selection of fuels and vehicles, and thinking flexible about delivery methods.
- We will consider the environmental impacts of our suppliers, alongside quality and cost. We will set environmental standards for our suppliers, and work with them to achieve these.
- We will reduce the amount of waste we create: We will minimize our use of materials, design and modify our operations to minimize waste production, use materials longer where practicable, and always investigate recycling opportunities for used materials.

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Environmental Management Systems Manual		
ENVIRONMENTAL POLICY	Section-1, Clause-4.2	Revision no.: 0
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- We will invite opinions and feedback on our methods and goals from inside and outside the company, and publish our ideas for furthering best environmental practice in the transport sector.
- We will communicate our policy to persons working in house on our behalf, for example, contractors and trainees.

Signature

Designation of the Head of the Company/Date

Reference SOP—[Number—ESM-4.2, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
PLANNING	Section-1, Clause-4.3	Revision no.: 0
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Planning

The “Your Company Name” has developed and maintained structured plan to be in compliance environmental management system ISO 14001:2004. The environmental management system coordinator is responsible to develop plans.

Reference SOP—[Number—ESM-4.3, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
ENVIRONMENTAL ASPECTS	Section-3.1, Clause-4.3.1	Revision no.: 0
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Environmental Aspects

The “Your Company Name Here” has established and maintained (a) procedure(s) to identify the environmental aspects of its activities, products, or services that it can control and over which it can be expected to have an influence, in order to determine those which have or can have significant impacts on the environment. The organization has ensured that the aspects related to these significant impacts are considered in setting its environmental objectives.

The review of aspects includes planned or new developments and new or modified activities, products, and services within the aspects process.

Significant aspects are considered during establishing, maintaining, and developing the EMS programs as a basis to set EMS objectives.

The organization keeps this information up-to-date.

Reference SOP—[Number—ESM-4.3.1, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
DEFINITIONS	Section-3.1, Clause-4.3.1	Revision no.: 0
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Definitions

Following are the definitions applicable to ISO 14001:2004 Environmental Standard.

Without normative references environment is defined as surrounding in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelationship.

The definition of surrounding in the context may be extended from within an organization to the global system. There are no references present, however, following definitions include seven new definitions (marked "N") and a number of changes to the existing definitions. The definitions changed from ISO 14001:1996 to ISO 14001:2004 are marked "C" in bracket.

Continual Improvement (C)

Process of enhancing the environmental management system to achieve improvements in overall environmental performance in line with the organization's environmental policy.

Corrective Action (N)

Action to eliminate the cause of a detected nonconformity.

Document (N)

Information and its supporting medium.

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Environment

Surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelationship.

Environmental Aspect

Element of an organization's activities, products, or services that can interact with the environment.

Environmental Impact

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products, or services.

Environmental Management System (C)

The part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy.

Environmental Management System Audit

A systematic and documented verification process of objectively obtaining and evaluating evidence to determine whether an organization's environmental management system conforms to the environmental management system audit criteria set by the organization and for communication of the results of this process to management.

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DEFINITIONS	Section-3.1, Clause-4.3.1	Revision no.: 0
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Environmental Objectives (C)

Overall environmental goal, arising from the environmental policy, that an organization sets itself to achieve and which is quantified where practicable.

Environmental Performance (C)

Measurable results of the environmental management system, related to an organization’s environmental aspects based on its environmental policy objectives and targets.

Environmental Policy

Statement by the organization of its intentions and principles in relation to its overall environmental performance, which provides a framework for action and for the setting of its environmental objectives and targets.

Environmental Target

Detailed performance requirement quantified where practicable, applicable to the organization or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.

Internal Audit (N)

Systematic, independent, and documented process for obtaining audit evidence and evaluation to objectively determine the extent to which the environmental management system audit criteria set by the organization are fulfilled.

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Interested Party

Individual or group concerned with or affected by the environmental performance of an organization.

Nonconformity (N)

Nonfulfillment of a requirement.

Organization

Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether in corporate or not, public or private, that has its own functions and administration.

Preventive Action

Action to eliminate the cause of a potential nonconformity.

Procedure

Specified way to carry out an activity or a process.

Record

Document stating results achieved or providing evidence of activities performed.

Prevention of Pollution (C)

Use of processes, practices, materials, or products that avoid, reduce, or control pollution. Which may include recycling, treatment, process

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changes, control mechanisms, efficient use of resources, and material substitution.

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Environmental Management Systems Manual		
LEGAL AND OTHER REQUIREMENTS	Section-3.2, Clause-4.3.2	Revision no.: 0
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Legal and Other Requirements

The organizational management has established and maintained a procedure to identify and have access to legal and other requirements to which the organization subscribes, that is, applicable to the environmental aspects of its activities, products or services in developing, implementing, and maintaining EMS.

Reference SOP—[Number-ESM-4.3.2, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
OBJECTIVES AND TARGETS	Section-3.3, Clause-4.3.3	Revision no.: 0
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Objectives and Targets

The “Your Company Name” has established and maintained documented environmental objectives and targets, at each relevant function and level within the organization.

When establishing and reviewing the objectives, due consideration is given to the legal and other requirements, its significant environmental aspects, its technological options and its financial, operational and business requirements, and the views of interested parties.

The objectives and targets are consistent with the environmental policy, including the commitment to continual prevention of pollution and improvement.

Reference SOP—[Number—ESM-4.3.3, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
ENVIRONMENTAL MANAGEMENT PROGRAM(S)	Section-3.4, Clause-4.3.4	Revision no.: 0
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Environmental Management Program(s)

The program has been established and maintained (a) for achieving the objectives and targets includes:

Designation of responsibility for achieving objectives and targets at each relevant function and level of the organization.

The means and time frame by which they are to be achieved.

If a project relates to new developments and new or modified activities, products or services, program(s) are amended where relevant to ensure that environmental management applies to such projects.

Reference SOP—[Number—ESM-4.3.4, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
IMPLEMENTATION AND OPERATION	Section-4, Clause-4.4	Revision no.: 0
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Implementation and Operation

The organization has defined roles, responsibilities, and authorities to facilitate effective environmental management system. The resources provided include personnel, specialized skills, technology, and financial.

Reference SOP—[Number—EMS-4.4, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
RESOURCES, ROLES, RESPONSIBILITIES, AND AUTHORITIES	Section-4.1, Clause-4.4.1	Revision no.: 0
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Resources, Roles, Responsibilities, and Authorities

Roles, responsibilities, and authorities are defined, documented, and communicated in order to facilitate effective environmental management. For executive summary refer to Table 1.

Management provides resources essential to the establishment, implementation, maintaining, control, and improving of the environmental management system. Resources include human resources and specialized skills, technology and financial resources, contractors, temporary staff, and so on.

The organization’s top management has appointed management representative who, irrespective of other responsibilities, has defined roles, responsibilities, and authorities for:

Ensuring that environmental management system requirements are established, implemented, and maintained in accordance with this International Standard:

The environmental management system coordinator (management representative) is responsible for the performance of the environmental management system to top management for review and as a basis for improvement of the environmental management system.

Describe brief responsibilities of the key personnel identified in the organization chart in Table 1.

Reference SOP—[Number—EMS-4.4.1, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
RESOURCES, ROLES, RESPONSIBILITIES, AND AUTHORITIES	Section-4.1, Clause-4.4.1	Revision no.: 0
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TABLE 1

Element in the Environmental System	Identify Functions Concerned/ Responsible in the Organization											
ISO 14001:2004 CLAUSE	A	B	C	D	E	F	G	H	I	J	K	L
4.1 General requirements												
4.2 Environmental policy												
4.3 Planning												
4.3.1 Environmental aspects												
4.3.2 Legal and other requirements												
4.3.3 Objectives and targets												
4.3.4 Environmental management program(s)												
4.4 Implementation and operation												
4.4.1 Resources, roles, responsibilities, and authorities												
4.4.2 Competence, awareness, and training												
4.4.3 Communication												
4.4.4 Environmental management system documentation												
4.4.5 Control of document												
4.4.6 Operational control												
4.4.7 Emergency preparedness and response												
4.5 Checking and corrective action												
4.5.1 Monitoring and measurement												
4.5.2 Evaluation of compliance												
4.5.3 Nonconformity, corrective action, and preventive action												
4.5.4 Control of records												
4.5.5 Internal audit												
4.6 Management review												

X RESPONSIBLE FUNCTIONS, * FUNCTIONS CONCERNED, - NOT APPLICABLE.
A-L Department responsible or function concerned.

YOUR COMPANY NAME HERE

Environmental Management Systems Manual		
COMPETENCE, AWARENESS, AND TRAINING	Section-4.2, Clause-4.4.2	Revision no.: 0
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Competence, Awareness, and Training

The company has identified training needs. It is ensured that all personnel (for, or on behalf of the organization) whose work may create a significant impact upon the environment, have received appropriate training, contractors, temporary staff, and so on.

Procedure is established and maintained to make the employees or external person at each relevant function and level aware of:

Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system, including emergency preparedness and response requirements.

The importance of conformance with the environmental policy and procedures and with the requirements of the environmental management system.

The significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance.

The potential consequences of departure from specified operating procedures.

Personnel performing the tasks, which can cause significant environmental impacts, are competent on the basis of appropriate education, training, and/or experience.

Reference Procedure—[Number—EMS-4.4.2, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
COMMUNICATION	Section-4.3, Clause-4.4.3	Revision no.: 0
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Communication

The procedure established and maintained with regard to environmental aspects and environmental management system of the organization for:

Internal communication between the various levels and functions of the organization.

Receiving, documenting, and responding to relevant communication from external interested parties.

The organization communicates pro-actively its significant aspects.

The companies consider the processes for external communication on its significant environmental aspects and record its decision.

Reference SOP—[Number—EMS-4.4.3, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
DOCUMENTATION	Section-4.4, Clause-4.4.4	Revision no.: 0
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Documentation

The “Your Company Name” has established and maintained information, in paper and electronic form, to describe the core elements of the management system and their interaction. Provide direction to related documentation. Describe the scope of the EMS in the system documentation.

Documents describing scope of EMS, effective planning, operation, and control of processes that relate to the significant aspects.

Reference SOP—[Number—EMS-4.4.4, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
CONTROL OF DOCUMENT	Section-4.5, Clause-4.4.5	Revision no.: 0
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Control of Document

The procedure has been established and maintained for controlling all documents in-house and external documents required by this International Standard to ensure that

They can be located.

They are periodically reviewed, revised as necessary, and approved for adequacy by authorized personnel.

The current versions of relevant documents are available at all locations where operations essential to the effective functioning of the environmental management system are performed.

Obsolete documents are promptly removed from all points of issue and points of use, or otherwise assured against unintended use.

Any obsolete documents retained for legal and/or knowledge preservation purposes are suitably identified.

Documentation is legible, dated (with dates of revision) and readily identifiable, maintained in an orderly manner and retained for a specified period. Procedures and responsibilities are established and maintained concerning the creation and modification of the various types of document.

Reference SOP—[Number—EMS-4.4.5, dated mm-dd-yyyy].

YOUR COMPANY NAME HERE

Environmental Management Systems Manual		
OPERATIONAL CONTROL	Section-4.6, Clause-4.4.6	Revision no.: 0
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Operational Control

The operations and activities that are associated with the identified significant environmental aspects in line with its policy, objectives, and targets have been identified. The organization plans these activities, including maintenance, in order to ensure that they are carried out under specified conditions by

Establishing and maintaining documented procedures to cover situations where their absence could lead to deviations from the environmental policy and the objectives and targets

Stipulating operating criteria in the procedures

Establishing and maintaining procedures related to the identified significant environmental aspects of goods and services used by the organization and communicating relevant procedures and requirements to suppliers and contractors

Reference SOP—[Number—EMS-4.4.6, dated mm-dd-yyyy]

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Environmental Management Systems Manual		
EMERGENCY PREPAREDNESS AND RESPONSE	Section-4.7, Clause-4.4.7	Revision no.: 0
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Emergency Preparedness and Response

The procedures are established and maintained to identify potential for and respond to accidents and emergency situations, and for preventing and mitigating the environmental impacts that may be associated with them.

The management reviews and revises, where necessary, its emergency preparedness and response procedures, in particular, after the occurrence of accidents or emergency situations.

The company also tests such procedures periodically where practicable.

Reference SOP—[Number—ISO 4.4.7, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
CHECKING AND CORRECTIVE ACTION	Section-5, Clause-4.5	Revision no.: 0
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Checking and Corrective Action

The company has established, documented, and maintained the procedures to initiate necessary corrective actions and preventive measures resulted from the findings, conclusions, and recommendations reached as a result of measuring, monitoring, audits, and other reviews of environmental management systems.

Reference SOP—[Number—EMS-4.5, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
MONITORING AND MEASUREMENT	Section-5.1, Clause-4.5.1	Revision no.: 0
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Monitoring and Measurement

The procedure is established, documented, and maintained to monitor and measure, on a regular basis, the key characteristics of operations and activities that can have a significant impact on the environment. This includes the recording of information to track performance, relevant operational controls, and conformance with the organization’s environmental objectives and targets.

Monitoring equipments are calibrated and maintained, and records are retained according to the procedures.

The company has established and maintained a documented procedure for periodically evaluating compliance with relevant environmental legislation and regulations. The procedures are available describing how to document information required to monitor performance, applicable operational controls, and conformity with objectives and targets.

Reference SOP—[Number—EMS-4.5.1, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
EVALUATION OF COMPLIANCE	Section-R, Clause-4.5.2	Revision no.: 0
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Evaluation of Compliance

The organizational evaluation of compliance includes both legal environmental requirements and other requirements to which an organization subscribes. The records of evaluation are maintained.

Reference SOP—[Number—EMS-4.5.2, dated mm-dd-yyyy].

YOUR COMPANY NAME HERE

Environmental Management Systems Manual		
NONCONFORMANCE, CORRECTIVE ACTION, AND PREVENTIVE ACTION	Section-5.2, Clause-4.5.3	Revision no.: 0
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Nonconformance, Corrective Action, and Preventive Action

Procedures have been established and maintained for evaluating the need for actions defining responsibility and authority for handling and investigating potential nonconformance, taking action to mitigate any impacts caused and for initiating and completing corrective and preventive action to avoid recurrence.

The corrective or preventive action taken to eliminate the causes of actual and potential nonconformances are appropriate to the magnitude of problems and commensurate with the environmental impact encountered.

The management, reviews, implements, and records any changes in the documented procedures resulting from corrective and preventive action.

Reference SOP—[Number—EMS-4.5.3, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
CONTROL OF RECORDS	Section-5.3, Clause-4.5.4	Revision no.: 0
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Control of Records

Reference SOP—[Number—EMS-4.5.4, dated mm-dd-yyyy].

YOUR COMPANY NAME HERE

Environmental Management Systems Manual		
INTERNAL AUDIT	Section-5.4, Clause-4.5.5	Revision no.: 0
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Internal Audit

The program and procedure have been established and maintained for periodic environmental management system audits to be carried out, in order to:

Determine whether or not the environmental management system

1. Conforms to planned arrangements for environmental management including the requirements of this International Standard
2. Has been properly implemented and maintained
3. Provide information on the results of audits to the management

The audit program and schedule is based on the environmental importance of the activity concerned and the results of previous audits. In order to be comprehensive, the audit procedures shall cover the audit scope, frequency, and methodologies, as well as the responsibilities and requirements for conducting audits and reporting results. The audit records are maintained. The selection of auditors ensures objectivity and the impartiality of the audit process.

Reference SOP—[Number—ESM-4.5.5, dated mm-dd-yyyy].

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Environmental Management Systems Manual		
MANAGEMENT REVIEW	Section-6, Clause-4.6	Revision no.: 0
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Management Review

The “Your Company Name” management, at intervals determines, reviews the environmental management system, to ensure its continuing suitability, adequacy, and effectiveness. The management review process ensures that the necessary information is collected to allow management to carry out this evaluation. This review is documented.

The management review address the possible need for changes to policy, objectives, and other elements of the environmental management system, in the light of environmental management system audit results changing circumstances and the commitment to continual improvement.

The management review includes specific inputs and outputs.

Each management review addresses an agenda in accordance with the requirement of ISO 14001:2004 international standard.

Reference SOP—[Number—ESM-4.6, dated mm-dd-yyyy].

YOUR COMPANY NAME HERE

List of Referenced SOP's

SECTION-7

Section	Subject	SOP no.	Revision no.	Issued on
1	General requirements	EMS-4.1	New	mm/dd/yy
2	Environmental policy	EMS-4.2	New	mm/dd/yy
3	Planning	EMS-4.3	New	mm/dd/yy
3.1	Environmental aspects	EMS-4.3.1	New	mm/dd/yy
3.2	Legal and other requirements	EMS-4.3.2	New	mm/dd/yy
3.3	Objectives and targets	EMS-4.3.3	New	mm/dd/yy
3.4	Environmental management program(s)	EMS-4.3.4	New	mm/dd/yy
4	Implementation and operation	EMS-4.4	New	mm/dd/yy
4.1	Resources, roles, responsibilities, and authorities	EMS-4.4.1	New	mm/dd/yy
4.2	Competence, awareness and training	EMS-4.4.2	New	mm/dd/yy
4.3	Communication	EMS-4.4.3	New	mm/dd/yy
4.4	Documentation	EMS-4.4.4	New	mm/dd/yy
4.5	Control of document	EMS-4.4.5	New	mm/dd/yy
4.6	Operational control	EMS-4.4.6	New	mm/dd/yy
4.7	Emergency preparedness and response	EMS-4.4.7	New	mm/dd/yy
5	Checking and corrective action	EMS-4.5	New	mm/dd/yy
5.1	Monitoring and measurement	EMS-4.5.1	New	mm/dd/yy
5.2	Evaluation of compliance	EMS-4.5.2	New	mm/dd/yy
5.3	Nonconformity, corrective action, and preventive action	EMS-4.5.3	New	mm/dd/yy
5.4	Control of records	EMS-4.5.4	New	mm/dd/yy
5.5	Internal audit	EMS-4.5.5	New	mm/dd/yy
6	Management review	EMS-4.6	New	mm/dd/yy

300.30

Standard Operating Procedure

300.30-1

General Requirements

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: General Requirements		SOP no.: EMS-4.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe general requirements in accordance with the clause 4.1 of ISO 14001:2004 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure

1. To define environmental policy, the following departmental managers are responsible to review, which may have major impact on

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: General Requirements		SOP no.: EMS-4.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
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Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

the environment. For details, refer to SOP EMS-4.2, Attachment no. 4.2 (1).

e.g. Production manager or supervisors as the case may be

Packaging manager or supervisors as the case may be

Stores managers or supervisors as the case may be

Shipping manager or supervisors as the case may be

Purchase manager or supervisors as the case may be

Quality assurance manager or supervisors as the case may be

Environmental management system coordinator

2. The review committee is headed by the management representative made responsible to develop and implement the environmental management system (environmental management system coordinator).
3. Initially the review is focused on regulatory compliance (refer local requirement), areas where liabilities are involved and efficient use of materials.
4. The environmental policy defined by the committee is approved by the general manager after the review and shall refer to include the following guidelines as applicable according to the type of industry.
 - Identification of legislative and regulatory requirements
 - Identification of environmental aspects of its activities, products, or services so as to determine those that have or can have significant environmental impacts and liabilities

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: General Requirements		SOP no.: EMS-4.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
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- Evaluation of performance compared with relevant internal criteria, external standards, regulations, codes of practice, and sets of principles and guidelines
 - Existing environmental management practices and procedures
 - Identification of the existing policies and procedures dealing with procurement and contracting activities
 - Feedback from the investigation of previous incidents of noncompliance
 - Opportunities for competitive advantage
 - The views of interested parties
 - Functions or activities of other organizational systems that can enable or improve environmental performance
5. In all cases, consideration is given to the full range of operating conditions, including possible incidents and emergency situations.
 6. The EMS system developed shall demonstrate continual improvement.
 7. The EMS system developed shall have defined scope.
 8. The process and results of the initial environmental review are documented and opportunities for EMS development are identified. The following techniques are used or as appropriate.
 - Questionnaires
 - Interviews
 - Checklists
 - Direct inspection and measurement

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: General Requirements		SOP no.: EMS-4.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
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- Record review
 - Bench marking
 - List of sensitive sites
9. Consultation with a number of outside sources such as
- Government agencies in relation to laws and permits
 - Local or regional libraries or databases
 - Other organizations for exchange of information
 - Industry associations
 - Larger customer organizations
 - Manufacturers of equipment in use
 - Business relations (e.g., with those who transport and dispose of waste)
10. For detailed description of aspect identification, refer to SOP no. EMS-4.3.2.

Documentation

1. List of activities, products and services and quantities involved, refer to Attachment no. 4.1 (1).
2. List of significant environmental aspects identified, refer to Attachment no. 4.1 (2).
3. Internal and external legal requirements review, refer to Attachment no. 4.1 (3).

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: General Requirements		SOP no.: EMS-4.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
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4. Historical review (list of previous incidents over the last ten years), refer to Attachment no. 4.1 (4).
5. Customers feedback (interested parties), refer to Attachment no. 4.1 (4).
6. For general overview of the aspects identification process, refer to Attachment no. 4.1 (6).
7. Examples of legal requirements, refer to Attachment no. 4.1 (7).
8. Examples of product aspects, refer to Attachment no. 4.1 (8).
9. Examples of supplier aspects, refer to Attachment no. 4.1 (9).
10. Interrelation of ISO 14001:2004 clauses, refer to Attachment no. 4.1 (10).
11. For alternative initial internal review, refer to Attachment nos. 4.1 (10), 4.1 (11), 4.1 (12), 4.2 (13), and 4.1 (14).



Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (1)

Activities/Products and Services

Activities	Prepared by (Concerned Manager)	Aspect	Impact	Annual Quantities	Annual Value
Aspect					
Products					
Services					

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (2)

Significant Aspects (List)

Aspects	Prepared by (Concerned Manager)	Technique Used	Significant, Impact on Environment
Activities 1) 2) 3) 4) 5) 6) 7) 8)		<ul style="list-style-type: none"> • Questioner • Interview • Checklist • Direct Inspections Measurements • Record Review • Benchmarking 	
Products 1) 2) 3) 4) 5) 6) 7)		<ul style="list-style-type: none"> • Questioner • Interview • Checklist • Direct Inspections Measurements • Record Review • Benchmarking 	
Services 1) 2) 3) 4) 5) 6) 7)		<ul style="list-style-type: none"> • Questioner • Interview • Checklist • Direct Inspections Measurements • Record Review • Benchmarking 	

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (3)

Internal and External Legal Requirements Review

Aspects	Reviewed by (Concerned Manager)	Current Practice	Internal Requirement	External Legal Requirements	Remarks
Activities					
Products					
Services					

Reviewed by:
(EMS Coordinator)

_____ **Signature**

_____ **Date**

SOP no.: EMS-4.1
Issue date: mm/dd/yyyy
Revision no.: New

Attachment no. 4.1 (4)

Historical Review

Incidents Effecting Environment	Prepared by (Concerned Manager)	Year	Impact	Remarks

Reviewed by:
(EMS Coordinator)

_____ Signature

_____ Date

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (5)

Customers Feedback

Aspects	Customer Concerned	Remarks (Concerned Manager)
Activities 1) 2) 3) 4) 5)		
Products 1) 2) 3) 4) 5)		
Services 1) 2) 3) 4) 5)		

Reviewed by:
(EMS Coordinator)

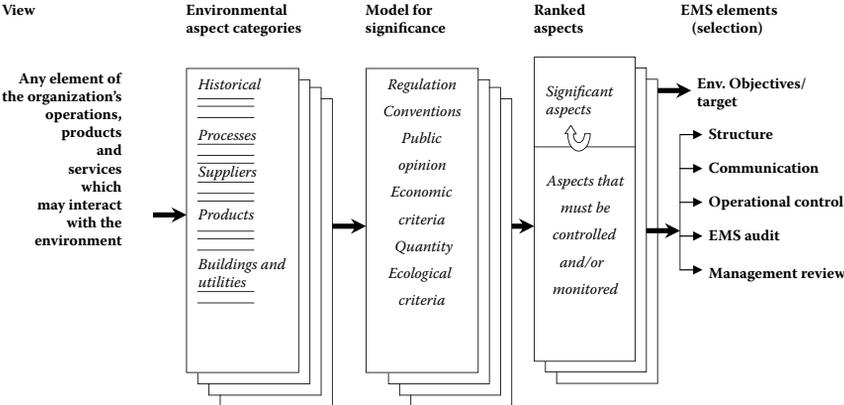
Signature

Date

SOP no.: EMS-4.1
Issue date: mm/dd/yyyy
Revision no.: New

Attachment no. 4.1 (6)

General Overview of the Aspects Identification Process



SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (7)

Examples of Legal Requirements List

Regulation	Application	Procedure
Air		
Environmental Protection Act 1990	Solvents to atmosphere	xxx
Environmental Protection Regulation 1991	Solvents to atmosphere	xxx
Environmental Protection Regulation 1993	Solvents to atmosphere	
Water		
Surface Waters Regulations	Discharge to water course	xyz
Water Resource Act	Discharge to cooling water to sewer	yyy
Control of Pollution Act	Discharge to cooling water to sewer	
Waste		
Environmental Protection Act	Waste management	zzz, xy, yz

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (8)

Examples of Product Aspects

Product	Aspect	Amount	Comment
Motors	Energy loss	Moderate	Small improvement in energy efficiency gives large change in lifetime impact
	Recyclability	High	
	Maintenance materials	Solvents needed	
	Noise	High	
Gas turbines	Energy loss	Low	Small improvement in energy efficiency gives large change in lifetime impact
	Recyclability	High	
	Maintenance chemical	Solvents needed	
Filters for yyy duty	Resource content	High	Filter is special waste at end of life due to contamination
	Recyclability	Nil	
	Eco-toxicity	High	
Rail vehicles, aluminum bodyshell	Resource content	High	Many other aspects known. Full LCA to be integrated into design process
	Energy content	High	
	Energy consumption	High	
	Recyclability	85%	
	Noise production	Moderate	
Rail vehicles, composite bodyshell	Cd contamination from conductor wire	Low	Many other aspects known. Full LCA to be integrated into design process
	Resource content	Moderate	
	Energy content	Low	
	Energy consumption	Low	
	Recyclability	Nil	
	Noise production	Moderate	
	Cd contamination from conductor wire	Low	

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (9)

Example of a Supplier Aspects List

Supplier	Materials	Aspects	Notes
A company	Molded plastic components	Discharge of VOCs to atmosphere. Consumption of nonrenewable resource	Emissions likely to have significant odor
B company	Plastic-insulated power cables	Discharge of VOCs to atmosphere	Low emissions
C company	Steel forgings	Consumption of large quantities of water for steel manufacture	Looking at recycle
D company	Chromium-plated metal parts	Discharge of chromium waste to watercourse	Prosecuted twice May go out of business We need alternative
E company	Solvent-based paints	Discharge of large quantities of VOCs to atmosphere	Looking to reduce emissions
F company	Hardwood flooring	Consumption of tropical hardwoods from nonmanaged forests	Supplies from managed sources now available. We will switch at end of contract
G company	Oils and lubricants	Consumption of nonrenewable resource. Sulfur dioxide emissions	Recently prosecuted for environmental damage to protected estuary
H company	Steel castings	Dust emissions to atmosphere, energy consumption, carbon dioxide emissions	Local pressure due to dust emissions
I company	Painted bodyshells	VOC emissions to atmosphere	Largest single source of VOCs in region. Abatement plan to be considered

Attachment no. 4.1 (12)

Initial Internal Review

Prepared by: Concerned Manager

ENVIRONMENTAL ASPECT	Reference Plan		Emit Noise		Monitored		Legal Requirements		Responsible for Monitoring		Objective Set		Target Set		Procedure Monitoring and Control		Staff Trained		Audits Conducted		Qualification		EMS Programs		Management Reviews		Remarks
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	
<ul style="list-style-type: none"> • Major accidents • Hazards regulations • Ozone-depleting substances • Poly chlorinated biphenyls • Special process requirements • Products controlling growth of natural <ul style="list-style-type: none"> - Flora - Fauna - Promote wildlife - Recreational facilities - Parks 																											

Reviewed by:
 (EMS Coordinator)

 XYZ
 Signature

 mm/dd/yyyy
 Date

Y = Yes
 N = No

SOP no.: EMS-4.1
 Issue date: mm/dd/yyyy
 Revision no.: New

Attachment no. 4.1 (13)

Initial Internal Review

Prepared by: Concerned Manager

RESOURCE MANAGEMENT	Reference Plan		Emit Noise		Monitored		Legal Requirements		Responsible for Monitoring		Objective Set		Target Set		Procedure Monitoring and Control		Staff Trained		Audits Conducted		Qualification		EMS Programs		Management Reviews		Remarks		
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N			
<ul style="list-style-type: none"> • Water consumption • Fuel • Electricity • Recycling activities <ul style="list-style-type: none"> - Products - Materials - Process • Use of land • Activities leading to <ul style="list-style-type: none"> - Odor - Dust - Vibrations - Visual impact 																													

Reviewed by:
 (EMS Coordinator)

XYZ
 Signature

mm/dd/yyyy
 Date

Y = Yes
 N = No

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (14)

Final Management System Assessment Review (Internal)

Prepared by: Concerned Manager

Management System	YES	NO	Date	Remarks
• Environmental aspects identified of activities, products, or services				
• Aspects of significance impact on environment determined				
• The top 5 impacts determined				
• Objectives and targets made				
• Policy documented authorized				
• Policy made available to public				
• EMS integrated with <ul style="list-style-type: none"> - Quality system - Health and safety - None 				
• Regulatory requirements listed				
• Program made for EMS				
• EMS responsibilities defined				
• EMS coordinator appropriated				
• Training provided on <ul style="list-style-type: none"> - Communication - Documentation - Document control 				
• Conditions considered <ul style="list-style-type: none"> - Normal - Abnormal - Accidents/Emergencies 				

Reviewed by: XYZ
(EMS Coordinator) **Signature**

 mm/dd/yyyy
Date

Approved by: XYZ
(General Manager) **Signature**

 mm/dd/yyyy
Date

300.30-2

Environmental Policy

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Policy		SOP no.: EMS-4.2
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for the development of environmental policy in accordance with clause 4.2 of ISO 14001:2004 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement environmental policy requirements described in the procedure. ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Definition

Statement by the organization of its intentions and principles in relation to its overall environmental performance which provides a framework for action and for setting of its environmental objectives and targets.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Policy		SOP no.: EMS-4.2
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Procedure

Note: The environmental policy will be based on initial reviews, aspects of significant environmental impacts and will be approved by the general manager after the review of objectives and targets.

1. The environmental policy is established to provide direction and set the principles of the action for an organization

The environmental policy will be communicated to

- Company employees
 - Persons working on company behalf
 - Contractors will be communicated about the policy and EMS-4.4.6 using suitable forms defining rules, directives, and procedures
2. The responsibilities to develop overall direction, policies, and objectives and targets are defined in Attachment no. 4.2 (1). The concerned employees can follow attachments provided in SOP no. EMS-4.1.
 3. The policies derived by the managers will be reviewed and audited by EMS coordinator, refer to Attachment no. 4.2 (2).
 4. The EMS coordinator ensures that environmental policy has been developed based on the following considerations:
 - The organization’s mission, vision, core values, and beliefs
 - Requirements of and communication with interested parties
 - Continual improvement
 - Prevention of pollution

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Policy		SOP no.: EMS-4.2
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

- Guiding principles
 - Coordination with other organizational policies (e.g., quality, occupational health, and safety)
 - Specific local or regional conditions
 - Compliance with relevant environmental regulation, laws and other criteria to which the origination subscribes
5. Some issues which are considered in the development of environmental policy are below
- The organization environmental policy is relevant to its activities, products, and services.
 - The policy reflects the organization’s value and guiding principles.
 - The environmental policy has been approved by top management and has someone been identified and given the authority to oversee and implement the policy.
 - The policy guides the setting of environmental objectives and targets.
 - The policy guides the organization toward monitoring appropriate technology and management practices.
 - Commitment is embodied in the environmental policy for support for continual improvement, support for the prevention of pollution, monitoring, meeting or exceeding applicable legal requirements, environmental legislation and regulations, and consideration of the exceptions of interested parties.
6. The EMS coordinator is responsible to get approval of the policy from the general manager.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Policy		SOP no.: EMS-4.2
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

7. The environmental policy is approved by the general manager of the company.
8. The concerned departmental managers and supervisors are responsible for implementation and provide continuous input for the modification of the policy if necessary.
9. Last but not the least, the policy is derived from the aspects of significant impacts over the environment and made part of the organization objectives and targets included in the program to ensure continuous improvement.

Documentation

1. Environmental Management System Manual, EMS 1
2. Responsibilities, refer to Attachment no. 4.2 (1)
3. Policy audit checklist, refer to Attachment no. 4.2 (2)

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.2
Issue date: mm/dd/yyyy
Revision no.: New

Attachment no. 4.2 (1)

Responsibilities

Copy to: All Concerned

Environmental Responsibilities	Typical Person(s) Responsible
Establish overall direction	General manager, chief executive officer (CEO), board of directors
EMS defined with clear scope	General manager, chief executive officer (CEO), board of directors
Develop environmental policy	President, environmental management system (EMS) coordinator
Develop environmental objectives, targets, and programs	Relevant managers
Monitor overall EMS performance	Chief environmental manager
Assure regulatory compliance	Senior operating manager
Ensure continual improvement	All managers
Identify customers expectations	Sales and marketing staff
Identify suppliers expectations	Purchasers, buyers
Develop and maintain accounting procedures	Finance/accounting managers
Comply with defined procedures	All staff
Policy communicated to those who are involved inside and outside company operations and public	EMS coordinator, employees, contractors

* Note: In the case of small industrial units, the person responsible can be the owner.

Reviewed by: _____
(EMS Coordinator) Signature Date

SOP no.: EMS-4.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.2 (2)

Policy Audit Checklist

To: Concerned Manager

Policy No.: _____

1. Policy Statement	YES	NO	Remarks
COMMENTS			
1. Policy statement was made prior to identification of environmental aspect	<input type="checkbox"/>	<input type="checkbox"/>	
2. No modification to the policy statement was made	<input type="checkbox"/>	<input type="checkbox"/>	
3. Policy statement links to aspects	<input type="checkbox"/>	<input type="checkbox"/>	
4. The policy statement is supported with objectives and targets	<input type="checkbox"/>	<input type="checkbox"/>	
5. Policy statements clearly define scope of EMS	<input type="checkbox"/>	<input type="checkbox"/>	
6. The employees at all levels of the organization are aware of the policy statement (understand and implement)	<input type="checkbox"/>	<input type="checkbox"/>	
7. The policy was made aware by report/display	<input type="checkbox"/>	<input type="checkbox"/>	
8. The policy statement ensures that, as a minimum, regulatory and legislation compliance will be achieved (if there is any) as part of objectives and target	<input type="checkbox"/>	<input type="checkbox"/>	
9. The interested parties requirements are respected	<input type="checkbox"/>	<input type="checkbox"/>	
10. The compliance to the policy has resulted in the continual improvement in overall performance and is measurable	<input type="checkbox"/>	<input type="checkbox"/>	
11. The policy has resulted in the prevention of pollution by the use of processes/practices/materials or products/ reduce or control pollution which may include recycling, treatment, process changes control mechanisms, efficient use of resources and materials substitution	<input type="checkbox"/>	<input type="checkbox"/>	

1. Policy Statement	YES	NO	Remarks
12. The policy compliance refers to best available technology where economically viable, cost effective, and judged appropriately	<input type="checkbox"/>	<input type="checkbox"/>	
13. Management systems	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Improved definition of responsibilities, management structure, and interfaces 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Better control and dissemination of documentation/ information 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Process parameters better defined and formalized 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Defined management and operational practices 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Efficiency of corrective/preventive action systems 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Quality of monitoring and measurement information 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Effectiveness of audit and review cycle 	<input type="checkbox"/>	<input type="checkbox"/>	
14. Training/Communication	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Staff, suppliers, contractors/subcontractors, customer, and public environmental awareness programs 	<input type="checkbox"/>	<input type="checkbox"/>	
15. Products	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Reduction of material input 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Selection of alternative materials with less significant environmental impacts 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Improved recyclability of products 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • The use of less/alternative packaging 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • Increased efficiency in distribution/transport 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • The design of products to minimize their environmental impacts during production, use, and disposal 	<input type="checkbox"/>	<input type="checkbox"/>	
16. Processes	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • The use of cleaner technologies that are more efficient in resource and material consumption 	<input type="checkbox"/>	<input type="checkbox"/>	
<ul style="list-style-type: none"> • The recovery and re-use materials 	<input type="checkbox"/>	<input type="checkbox"/>	

continued

1. Policy Statement	YES	NO	Remarks
• Recyclability waste products	<input type="checkbox"/>	<input type="checkbox"/>	
• Reduction of wastes	<input type="checkbox"/>	<input type="checkbox"/>	
• Reduction and elimination of polluting releases to the environment	<input type="checkbox"/>	<input type="checkbox"/>	
• Prevention of environmental accidents, mitigation of their environmental impacts, and contingency planning	<input type="checkbox"/>	<input type="checkbox"/>	
17. Natural resources	<input type="checkbox"/>	<input type="checkbox"/>	
• Minimization of resource usage	<input type="checkbox"/>	<input type="checkbox"/>	
• Use of renewable energy sources	<input type="checkbox"/>	<input type="checkbox"/>	
• Minimization of energy consumption	<input type="checkbox"/>	<input type="checkbox"/>	
• Recovery and reuse of energy	<input type="checkbox"/>	<input type="checkbox"/>	
18. Raw materials and bought-in goods	<input type="checkbox"/>	<input type="checkbox"/>	
• Use renewable materials	<input type="checkbox"/>	<input type="checkbox"/>	
• Use recyclable materials	<input type="checkbox"/>	<input type="checkbox"/>	
• Pressure suppliers improvement in manufacture of raw materials	<input type="checkbox"/>	<input type="checkbox"/>	
• Preventative measures in transport, storage, and handling	<input type="checkbox"/>	<input type="checkbox"/>	
19. Communication	<input type="checkbox"/>	<input type="checkbox"/>	
• EMS policy is communicated to in-house staff	<input type="checkbox"/>	<input type="checkbox"/>	
• EMS policy is communicated to persons indirectly involved, e.g., contractors	<input type="checkbox"/>	<input type="checkbox"/>	

Remarks (if any): _____

Reviewed by: _____
 (EMS Coordinator) Signature Date

cc: General Manager

300.30-3

Planning

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Planning		SOP no.: EMS-4.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe procedures for performing environmental planning in accordance with clause 4.3 of ISO 14001:2004 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure

1. The environmental management system coordinator is responsible to develop a plan to enable the organization to comply with environmental policy.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Planning		SOP no.: EMS-4.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

2. The environmental management system elements include
 - Identification of environmental aspects and evaluation of associated environmental impacts
 - Legal requirements
 - Environmental policy
 - Internal performance criteria
 - Environmental objectives and targets
 - Environmental plans and management program
3. The above elements are considered in the management review meetings, initial assessment, and data are generated as apart of environmental planning.
4. The EMS coordinator defines the tasks, responsibilities, and the time frame for the successful achievement of the EMS program.



Documentation

1. Environmental Management System Plan, refers to Attachment no. 4.3 (1)
2. EMS Certification Plan, (optional), refer to Attachment no. 4.3 (2)
3. Example of approach to achieving a certified EMS, refer to Attachment no. 4.3 (3)

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Planning		SOP no.: EMS-4.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

5	Approval of policy																	
6	EMS program																	
7	Evaluation of performance																	
8	Internal audit																	
9	Management review																	
10	Preinspection																	
11	Certification																	
12	Surveillance visit																	

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.3

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.3 (2)

EMS Certification Plan

Goal No.	Target date	Result Paths								Codes: X = Executes work D = Takes decision solely d = Take decision jointly R = Responsible for progress C = Must be consulted I = Must be informed A = Available to advise	Team Responsibilities							
		Planning	Aspects	Documentation	Metrics	Training	Auditing, checking	Start up	Certification		Team leader	Team member 1	Team member 2	Team member 3	Site manager	Quality manager	All managers	All employees
1		●								When management support has been obtained, and resources and deliverables agreed	X	I	I	I	I	I	I	
2		●								When an initial review of the business has been completed					I	A	I	
3		●								When a milestone plan for the EMS project has been agreed by the project team	d	d	d	d	I	A		
4			●							When the company's environmental aspects have been agreed	d	d	d	d		A		
5			●							When the legal requirements and other constraints have been identified	R							
6			●							When site policy, objectives, and targets have been agreed	X	X	X	X	D	I	I	
7				●						When system procedures, work instructions, and controls have been designed and issued	X	X	X	X		C	I	
8					●					When metrics/feedback on environmental performance are in place	X	X	X	X	I			
9						●				When key staff have been trained and all staff are aware of the company's program	R						I	
10							●			When audit program is running	R	I	I	I		I		
11								●		When first management review has taken place	R	I	I	I	X	X	I	
12								●		When the EMS has been checked against the standard	R	I	I	I				
13								●		When the EMS has been checked against the significant aspects	R	I	I	I				
14								●		When the EMS has been checked for loop closure	R	I	I	I				
15								●		When the initial visit by the certifier has taken place	R	I	I	I	I	I		
16								●		When the audit visit has taken place	R	I	I	I	I	I	I	
17								●		When certification has been obtained	R	I	I	I	I	I	I	

Reviewed by :
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.3

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.3 (3)

Example of Approach to Achieving a Certified EMS

Note: Modify the Approach for Your Company

- | | |
|--|---|
| <p>1. When management support has been obtained and resources agreed.</p> | <p>Top management agreement and active support. Resources needed include money, time, and people.</p> |
| <p>2. When the Legal Requirements have been identified.</p> | <p>Constraints, including regulatory, insurance, contractual, business requirements, public perceptions, views of other interested parties, etc.</p> |
| <p>3. When an Initial Review of the business has been completed and when the company's Environmental Aspects have been identified.</p> | <p>Rate and rank environmental aspects to identify most significant. Include potential liabilities from the initial.</p> |
| <p>4. When a milestone plan for the EMS project has been agreed.</p> | <p>Plan project and agree project responsibilities. Identify and obtain support of project team.</p> |
| <p>5. When Policy, Objectives, Targets have been agreed.</p> | <p>Agree policy, objectives, and targets. Must be relevant to the significant aspects.</p> |
| <p>6. When the Environmental Program has been agreed</p> | <p>Design and agree program. Agree responsibilities. Needs to be simple and easily understood.</p> |
| <p>7. When System Procedures, Work Instructions, and controls have been designed and issued.</p> | <p>Design, draft, agree, implement. Documentation should be as clear, easily understood and as short as possible. Involve employees in writing work instructions. Try to use flow diagrams, not text.</p> |
| <p>8. When metrics/feedback on Environmental Performance are in place.</p> | <p>Design, implement. Relating metrics to turnover or output will allow benchmarking against other companies.</p> |
| <p>9. When key staff have been Trained and all staff are Aware of the company's program.</p> | <p>Train key staff. Incorporate into existing staff training program if appropriate. Implement program of staff briefings to ensure awareness of company staff.</p> |

- | | |
|---|--|
| 10. When the Audit program is running. | Design audit protocols and program.
Implement. Auditors and audit program must be credible. |
| 11. When the first Management Review has taken place. | Implement. Needs to be at least one management review to obtain certification. |
| 12. When the EMS has been checked against the standard. | Do clause trace table. Fill any missing or incomplete areas. |
| 13. When the EMS has been checked against significant aspects. | Confirm all significant effects managed. |
| 14. When the EMS has been checked for loop-closure. | Check all loops closed, e.g., corrective actions, nonconformances, communications. |
| 15. When the Initial Visit by the certifier has taken place. | Incorporate any changes required. |
| 16. When the Audit Visit has taken place. | Close out any nonconformances. |
| 17. When Certification has been obtained. | Success. |

300.30-4

Environmental Aspects

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Aspects		SOP no.: EMS-4.3.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe a procedure for identifying Environmental Aspects in accordance with clause 4.3.1 of ISO 14001:2004 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. ISO 14001:2004 systems coordinator (environmental management system coordinator) is responsible for SOP compliance.

Definitions

- Environment (3.2)
Surroundings in this context extend from within an organization to the global system.

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Note: Surroundings in this context extend from within an organization to the global system.

- Environmental aspect (3.3)

Element of an organization's activities, products, or services which can interact with the environment.

Note: A significant environmental aspect is an environmental aspect which has or can have a significant environmental impact.

- Environmental impact (3.4)

Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products, or services.

Procedure

1. The identification of the environmental aspects of significance is a continuous process.
2. The identification of aspects is based on the past, current, and potential impacts (positive or negative) of the organizations activities on the environment.
3. The aspect evaluation maybe conducted using the following or a combination of the following techniques.
 - Past performance review
 - Product review (LCA)

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- Site assessment
 - Product/process data review
 - Communications review
 - Environmental impact assessment
 - Compliance audits
 - Environmental audit
 - Environmental performance evaluation
4. The aspects evaluation shall also consider
- Inclusion of planned or new developments and new or modified activities, products, and services within the aspects process.
5. The clear requirements for the information from the aspects shall be documented.
6. Significant aspects shall also be considered where establishing and maintaining/developing the EMS in general and as a basis to set the EMS objectives.
7. The identification of environmental aspects and evaluation of associated environmental impacts is carried out as follows:
- A. Source
 - B. Controlled and uncontrolled emissions to the atmosphere
 - C. Controlled and uncontrolled discharges to water
 - D. Contamination of land
 - E. Solid waste
 - F. Use of raw materials and other natural resources

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- G. Use of energy
 - H. Use of water
 - I. Noise, odor, dust, vibration, and visual impact
 - J. Effect on the ecosystem
 - K. Upstream effects
 - Energy
 - Water
 - Raw materials
 - L. Downstream effects
 - M. Past effects
 - N. Future effects
 - O. Selection test
 - P. Environmental impact evaluation
 - Q. Identification of level of significance
8. Prepare list of company's product, services, and activities.
 9. Refer to Attachment no. 4.3.2 (1) in order to establish the initial information on significant aspects and impacts.
 10. The other issues considered in identification of environmental aspects and evaluation of environmental impacts are as follows:
 - The environmental aspects of the organization's activities, products, and services.
 - The organization has a procedure for evaluation of the environmental impacts of new projects.

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- The location of the organization and the sensitive environmental areas.
 - How will any intended changes or additions to activities, products, or services affect the environmental aspects and their associated impacts.
 - The significance or sever of the potential environmental impacts which may lead to process failure.
 - The frequency of the situation that could lead to the impact.
 - The significant environmental impacts are local, regional, and global in scope.
11. The identification of significant priority environmental impacts is carried out as follows:
- Identify as many actual and potential, positive and negative, environmental impacts, as possible associated with each identified aspect of activity, product or services as follows:

Activity, Product, or Service	Aspect	Impact
Activity—handling of hazardous materials	Potential for accidental spillage	Contamination of soil or water
Product—product refinement	Reformulation of the product to reduce its volume	Conservation of natural resources
Service—vehicle maintenance	Exhaust emissions	Reduction of air emissions

12. The significance of each of the identified environmental impacts can be different for each organization. Quantification can aid judgment.

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13. Two-step process is established to award a numerical score to each environmental effect to quantify the relative importance of different criteria. You should adjust and review the scoring system to suit the circumstances of your company and your particular site.

Step A: Normal operating conditions

For normal operating conditions, each environmental effect is awarded a score to reflect the relative importance of:

1. Legislation (both current and forthcoming).
2. Environmental damage, for example, toxicity, acidity, greenhouse gas emissions, ozone-depleting substances.
3. Interested parties, for example, the reaction of the local residents, environmental interest groups.
4. Quantity, for example, the volume of the waste stream or the frequency of occurrence at the foundry.

The matrix shown below illustrates the way in which a particular environmental effect can be scored under normal operating conditions.

The scores are multiplied by a weighting factor, which reflects the overall importance of the criteria at a particular site or within a particular company. You should adjust these as necessary to reflect your company concerns. Adding the four multiplications together produces a total score for this environmental effect under normal operating conditions. This total score is then used to rank the particular environmental effect under normal operating conditions.

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	Score				Weighing Factor
	3	2	1	0	
Legislation	Existing	Impending		None	x 2 = <i>a</i>
Environmental damage	Known detriment	Possible detriment	Limited detriment	No detriment	x 3 = <i>b</i>
Interested parties	Considerable interest	Moderate interest	Little interest	No interest	x 2 = <i>c</i>
Quantity	High	Medium	Low	Nil	x 3 = <i>d</i>

Normal operating conditions total score = (a + b + c + d).

Step B: Other operating conditions

The same environmental effect is also awarded a numerical score under other operating conditions to reflect the importance of four further criteria:

1. Abnormal operations, for example, factory start-up after a holiday shutdown period.
2. Accident/emergency, for example, fire, accidental damage.
3. Past activities, for example, activities of former site occupant, burial of foundry waste on site.
4. Planned activities, for example, new product or production line, site development.

The four scores are again added to produce a total score under other operating conditions as shown below. This total score is used to rank the environmental effects under other operating conditions. For working format, refer to Attachment no. 4.3.2 (2).

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YOUR COMPANY NAME HERE**

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		Score				
		12	6	3	0	
Abnormal operations			Increased environmental impact	No change	Reduced environmental impact	= a
Accident/ Emergency			Increased environmental impact	No change	Reduced environmental impact	= b
Past activities	Evident/requires action		Possible damage/ difficult to evaluate		No damage	= c
Planned activities	High		Increased environmental impact	No change	Reduced environmental impact	= d

Other operating conditions total score = (a + b + c + d).

- After the scoring, prepare the final list with the total score. The top priority is assigned to the aspect of highest score.

Step C: Financial Scoring

However, it is subject to the final approval of the managing director and the financial scoring.

- The business concerns are subdivided and assigned a number for low, medium, and high
 - Potential regulatory and legal exposure
 - Difficulty of changing the impact

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- Cost of changing the impact
- Effect of change on other activities and processes
- Concerns of interested parties
- Effect on the public image of the organization

Key to Scoring

0–37 = Insignificant

38–max. = Significant

16. Legal and other requirements

The organization has established and maintained procedures to identify and have access to and understand all legal and other requirements to which it subscribes, directly attributable to the environmental aspects of its activities, products, or services.

To maintain regulatory compliance, an organization has identified and followed regulatory requirements applicable to its activities, products, or services. Regulations exist in several forms.

- Those specific to the activity (e.g., site-operating permits)
- Those specific to the organizations products or services
- Those specific to the organizations industry
- General environmental laws
- Authorizations, licenses, and permits

Following sources are used to identify environmental regulations and ongoing changes, including:

- All levels of government

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- Industry associations or groups
- Commercial databases
- Professional services

To facilitate keeping track of legal requirements, an organization has established and maintained a list of all laws and regulations pertaining to its activities, products, or services.

17. Some issues considered in legal and other requirements

- Traces and identification of relevant legal and other requirements
- Tracking of legal and other requirements
- Tracking of changes to legal and other requirements
- Communication of relevant information on legal and other requirements to employees.

18. Internal performance criteria

Internal priorities and criteria's have been developed and implemented where external standard do not meet the needs of the organization or are nonexistent. Internal performance criteria, together with external standards, assist the organization in developing its own objectives and targets.

19. The areas where an organization has internal performance criteria includes

- Management systems
- Employee responsibilities
- Acquisition, property management, and divestiture
- Suppliers
- Contractors

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- Product stewardship
- Environmental communication
- Regulatory relationships
- Environmental incident response and preparedness
- Environmental awareness and training
- Environmental measurement and improvement
- Process risk reduction
- Prevention of pollution and resource conservation
- Capital projects
- Process change
- Hazardous material management
- Waste management
- Water management (e.g., waste, storm, ground)
- Air quality management
- Energy management
- Transportation

Documentation

1. Environmental aspects/significance evaluation matrix, refer to Attachment no. 4.3.1 (1) (Register of Environmental Impacts).
2. Aspects significance ranking list, refer to Attachment no. 4.3.1 (2).

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Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.3.1
 Issue date: mm/dd/yyyy
 Revision no.: New

Attachment no. 4.3.1 (1)

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE:	ACTIVITY:	PRODUCT:	SERVICES:
LOCATION	AREA		
ENVIRONMENTAL ASPECT	OTHER INFORMATION	IMPACT	IMPACT CODE
• Controlled and uncontrolled emissions to atmosphere			
• Controlled and uncontrolled discharges to water			
• Contamination of land			
• Solid waste			
• Use of raw materials and other natural resources			
• Use of energy			
• Use of water			
• Use of raw materials			
• Noise, odor, dust, vibration, and visual impact			

SOURCE:	ACTIVITY:	PRODUCT:	SERVICES:
LOCATION	AREA		
ENVIRONMENTAL ASPECT	OTHER INFORMATION	IMPACT	IMPACT CODE
• Effects on ecosystems			
• Upstream effects			
• Energy, water, raw materials			
• Downstream effects			
• Past effects			
• Future effects			
• Selection test			
• Environmental impact evaluation			
• Identification of level of significance			
• New developments			
• Modified activities, products, services			
• Aspects during maintaining and developing the EMS			

A: Ranking of environmental effects under normal operation conditions													
Elements	Conditions/Score						Weighting factor			Remarks			
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total	
Legislation	Existing		Impending				None		×	2	<i>a</i>		
Environmental damage	Known detriment		Possible detriment		Limited detriment		No detriment		×	3	<i>b</i>		
Interested parties	Considerable interest		Moderate interest		Little interest		No interest		×	2	<i>c</i>		
Quantity	High		Medium		Low		Nil		×	3	<i>d</i>		
Normal operating conditions total = (a + b + c + d)										Total A			

B: Ranking of environmental effect under other operating conditions											
Elements	Conditions/Score								Total		Remarks
	Condition	12	Condition	6	Condition	3	Condition	0			
Abnormal operations			Increased environmental impact		No change		Reduced environmental impact			<i>a</i>	
Accident/emergency			Increased environmental impact		No change		Reduced environmental impact			<i>b</i>	
Past activities	Evident/ requires action		Possible damage/ difficult to evaluate				No damage			<i>c</i>	
Planned activities/Modified activities, products, and services, elements during maintaining and development of EMS			Increased environmental impact		No change		Reduced environmental impact			<i>d</i>	
Other operating conditions total score = (a + b + c + d)									Total B		

C: Cost factor ranking of environmental effects													
Elements	Very high	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost													
Estimated													
Cost factor										Total C			
FINAL SCORE: = A + B + C		Identification level of significance											

Remarks: _____

Reviewed by: _____

EMS Coordinator

Signature

Date

300.30-5

Legal and Other Requirements

STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE

SUBJECT: Legal and Other Requirements		SOP no.: EMS-4.3.2
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe procedure for identifying and reviewing legal and regulatory aspects in accordance with clause 4.3.3 of ISO 14001:2004 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure

Note: The procedure describes explicit and comprehensive procedure to assign priority factor (numerical score) to the aspects of environmental concern and enables the company to scientifically

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YOUR COMPANY NAME HERE**

SUBJECT: Legal and Other Requirements		SOP no.: EMS-4.3.2
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
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and logically develop the EMS program. The procedure described is optional and helpful to assign priority. The procedure may provide good support to execute SOP no. EMS-4.1 and 4.3.1.

1. The identification of the legal and other environmental aspects is the responsibility of concerned managers.
2. The identification of aspects is based on the past, current, and potential impacts (positive or negative) of the organizations activities, products, and services on the environment. The data collected based on the SOP EMS-4.1 and EMS-4.3.1 can be assigned priority using the following procedure.
3. The aspects evaluation includes review of
 - Identification of potential regulatory requirements to an organization's environmental aspects.
 - Legal requirements to an organization's environmental aspects.
 - Impacts related to the health and safety.
 - Environmental risk assessment.
 - The EMS coordinator shall ensure that legal and other environmental requirements to which organization subscribes are considered in developing, implementing, and maintaining the EMS.
4. The identification of environmental aspects of significant environmental priority may be carried out as follows for your company.
5. Prepare a list of your company's activities, product, and services, refer to SOP EMS-4.1.
6. Refer to Attachment no. 4.3.2 (1) in order to establish the initial information on significant aspects and impacts.

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SUBJECT: Legal and Other Requirements		SOP no.: EMS-4.3.2
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7. The other issues considered in identification of environmental aspects and evaluation of environmental impacts are as follows:

- The environmental aspects of the organization’s activities, products, and services.
- The organization has a procedure for evaluation of the environmental impacts of new projects.
- The location of the organization and the sensitive environmental areas.
- How will any intended changes or additions to activities, products, or services affect the environmental aspects and their associated impacts.
- The significance or severity of the potential environmental impacts which may lead to process failure.
- The frequency of the situation that could lead to the impact.
- The significant environmental impacts are local, regional, and global in scope.

8. The identification of significant priority environmental impacts is carried out as follows:

- Identify as many actual and potential, positive and negative, environmental impacts, as possible associated with each identified aspect of activity, product, or services as follows:

Activity, Product, or Service	Aspect	Impact
Activity—handling of hazardous materials	Potential for accidental spillage	Contamination of soil or water
Product—product refinement	Reformulation of the product to reduce its volume	Conservation of natural resources
Service—vehicle maintenance	Exhaust emissions	Reduction of air emissions

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9. The significance of each of the identified environmental impacts can be different for each organization. Quantification can aid judgment.
10. Two-step process is established to award a numerical score to each environmental effect to quantify the relative importance of different criteria. You should adjust and review the scoring system to suit the circumstances of your company and your particular site.

Step A: Normal operating conditions

For normal operating conditions, each environmental effect is awarded a score to reflect the relative importance of:

1. Legislation (both current and forthcoming)
2. Environmental damage, for example, toxicity, acidity, greenhouse gas emissions, ozone-depleting substances
3. Interested parties, for example, the reaction of the local residents, environmental interest groups
4. Quantity, for example, the volume of the waste stream or the frequency of occurrence at the foundry

The matrix shown below illustrates the way in which a particular environmental effect can be scored under normal operating conditions.

The scores are multiplied by a weighting factor, which reflects the overall importance of the criteria at a particular site or within a particular company. You should adjust these as necessary to reflect your company's concerns. Adding the four multiplications together produces a total score for this environmental effect under normal

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operating conditions. This total score is then used to rank the particular environmental effect under normal operating conditions.

	Score				Weighing Factor
	3	2	1	0	
Legislation	Existing	Impending		None	x 2 = <i>a</i>
Environmental damage	Known detriment	Possible detriment	Limited detriment	No detriment	x 3 = <i>b</i>
Interested parties	Considerable interest	Moderate interest	Little interest	No interest	x 2 = <i>c</i>
Quantity	High	Medium	Low	Nil	x 3 = <i>d</i>

Normal operating conditions total score = (a + b + c + d).

Step B: Other operating conditions

The same environmental effect is also awarded a numerical score under other operating conditions to reflect the importance of four further criteria:

1. Abnormal operations, for example, factory start-up after a holiday shutdown period
2. Accident/emergency, for example, fire, accidental damage
3. Past activities, for example, activities of former site occupant, burial of foundry waste on site
4. Planned activities, for example, new product or production line, site development, implementing, and maintaining EMS

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SUBJECT: Legal and Other Requirements		SOP no.: EMS-4.3.2
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The four scores are again added to produce a total score under other operating conditions as shown below. This total score is used to rank the environmental effects under other operating conditions. For working format, refer to Attachment no. 4.3.2 (2).

		Score				
		12	6	3	0	
Abnormal operations			Increased environmental impact	No change	Reduced environmental impact	= a
Accident/ Emergency			Increased environmental impact	No change	Reduced environmental impact	= b
Past activities	Evident/requires action		Possible damage/ difficult to evaluate		No damage	= c
Planned activities	High		Increased environmental impact	No change	Reduced environmental impact	= d

Other operating conditions total score = (a + b + c + d).

11. After the scoring, prepare the final list with the total score. The top priority is assigned to the aspect of highest score, however, it is subject to the final approval of the general manager.
12. The business concerns are subdivided and assigned a number for low, medium, and high
 - Potential regulatory and legal exposure
 - Difficulty of changing the impact
 - Cost of changing the impact

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- Effect of change on other activities and processes
- Concerns of interested parties
- Effect on the public image of the organization

13. Legal and other requirements

The organization has established and maintained procedures to identify and have access to and understand all legal and other requirements to which is subscribes, directly attributable to the environmental aspects of its activities, products, or services.

To maintain regulatory compliance, an organization has identified and followed regulatory requirements applicable to its activities, products, or services. Regulations exist in several forms.

- Those specific to the activity (e.g., site-operating permits)
- Those specific to the organizations products or services
- Those specific to the organizations industry
- General environmental laws
- Authorizations, licenses, and permits

Following sources are used to identify environmental regulations and ongoing changes, including:

- All levels of government
- Industry associations or groups
- Commercial databases
- Professional services

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Legal and Other Requirements		SOP no.: EMS-4.3.2
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To facilitate keeping track of legal requirements, an organization has established and maintained a list of all laws and regulations pertaining to its activities, products, or services.

14. Some issues considered in legal and other requirements

- Traces and identification of relevant legal and other requirements
- Tracking of legal and other requirements
- Tracking of changes to legal and other requirements
- Communication of relevant information on legal and other requirements to employees.

15. Internal performance criteria

Internal priorities and criteria's have been developed and implemented where external standards does not meet the needs of the organization or are nonexistent. Internal performance criteria, together with external standards, assist the organization in developing its own objectives and targets.

16. The areas where an organization has internal performance criteria include

- Management systems
- Employee responsibilities
- Acquisition, property management, and divestiture
- Suppliers
- Contractors
- Product stewardship

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

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- Environmental communication
- Regulatory relationships
- Environmental incident response and preparedness
- Environmental awareness and training
- Environmental measurement and improvement
- Process risk reduction
- Prevention of pollution and resource conservation
- Capital projects
- Process change
- Hazardous material management
- Waste management
- Water management (e.g., waste, storm, ground)
- Air quality management
- Energy management
- Transportation

Documentation

1. Environmental significant evaluation matrix, refer to Attachment no. 4.3.2. (1)
2. Environmental aspects and impacts priority, refer to Attachment no. 4.3.2. (2)

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

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3. Other example of significance aspect model, refer to Attachment no. 4.3.2. (3)
4. Example of an environmental flow chart for a construction site, refer to Attachment no. 4.3.2. (4)
5. Example of an environmental flow chart (transfer tank and cover manufacturing), refer to Attachment no. 4.3.2. (5)
6. Example of discharges from a manufacturing facility, refer to Attachment no. 4.3.2. (6)

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.3.2
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Attachment no. 4.3.2 (1)

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE:	ACTIVITY:	PRODUCT:	SERVICES:
LOCATION	AREA		
ENVIRONMENTAL ASPECT		DETAILS OF IMPACT	
• Emission to air			
• Release to water			
• Waste management (solid/liquid)			
• Contamination of land			
• Use of raw materials and natural resources			
• Other local environmental and community issues			
• Any other aspect			

Matrix to rank environmental effects under normal operation conditions												
Elements	Conditions/Score							Weighting factor			Remarks	
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply	Factor		Total
Legislation	Existing		Impending				None		×	2	<i>a</i>	
Environmental damage	Known detriment		Possible detriment		Limited detriment		No detriment		×	3	<i>b</i>	
Interested parties	Considerable interest		Moderate interest		Little interest		No interest		×	2	<i>c</i>	
Quantity	High		Medium		Low		Nil		×	3	<i>d</i>	
Normal operating conditions total = (a + b + c + d)										Total		
Elements	Conditions / Score							Total		Remarks		
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations			Increased environmental impact		No change		Reduced environmental impact			<i>a</i>		
Accident/emergency			Increased environmental impact		No change		Reduced environmental impact			<i>b</i>		
Past activities	Evident/ requires action		Possible damage/ difficult to evaluate				No damage			<i>c</i>		
Planned activities			Increased environmental impact		No change		Reduced environmental impact			<i>d</i>		
Other operating conditions total score = (a + b + c + d)								Total				

Remarks: _____

Reviewed by: _____

EMS Coordinator

Signature

Date

Attachment no. 4.3.2 (2)

Environmental Aspects and Impact Priority

Compiled by: EMS Coordinator

AREA	ACTIVITY, PRODUCT, OR SERVICES	Reference Attachment No: 4.3.2 (1)		TOTALS	POLICY NO.	RISK REDUCTION PROGRESS TO DATE
		Total under Normal Operating Conditions	Total under Other Operating Conditions			
Stores	Storage on site					
	Storage off site					
	Quarantine					
	Hazardous materials					
	Solvents					
	Inflammables					
	Released materials					
	Finished goods					
Production/ Assembly line	Slugs granulation					
	Cold extrusion					
	Lacquering					

AREA	ACTIVITY, PRODUCT, OR SERVICES	Reference Attachment No: 4.3.2 (1)		TOTALS	POLICY NO.	RISK REDUCTION PROGRESS TO DATE
		Total under Normal Operating Conditions	Total under Other Operating Conditions			
	Base coating					
	Drying					
	External coating					
	Drying					
Packaging	Boxing					
	Shrink wrapping					
Logistics	Shipping					
	Receiving					
	Transportation					
QC Laboratory	Chemical testing					

Reviewed by: EMS Review Committee (Remarks) _____

Approved by: General Manager:

Signature

Date

SOP no.: EMS-4.3.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.3.2 (3)

Other Example of Significance Assessment Model

Prepared by: Concerned Manager

Criteria	3 points	2 points	1 point
Regulation	Consistent regulatory noncompliance	Stricter regulatory requirements have been announced Temporary regulatory noncompliance	Used according to regulatory requirements No tightening of requirements is foreseen
Public opinion (internal and external)	The substance is subject to continual criticism by media and the public (despite regulatory compliance)	Independent experts call for stricter regulatory requirements	The substance is not subject to criticism
Economic criteria (material, waste, scrap)	Use of the substance generates significant losses of material	Use of the substance generates medium-size losses of material	Hardly any material losses
Quantity	Significant quantity or level	Medium quantity or level	Small or very small quantity or level
Ecological criteria	Use of the substance generates environmental impact throughout the production	Use of the substance generates environmental impact in some steps of the production process	No significant environmental impact during production

Remarks : _____

Reviewed by:

(EMS Coordinator)

_____ Signature

_____ Date

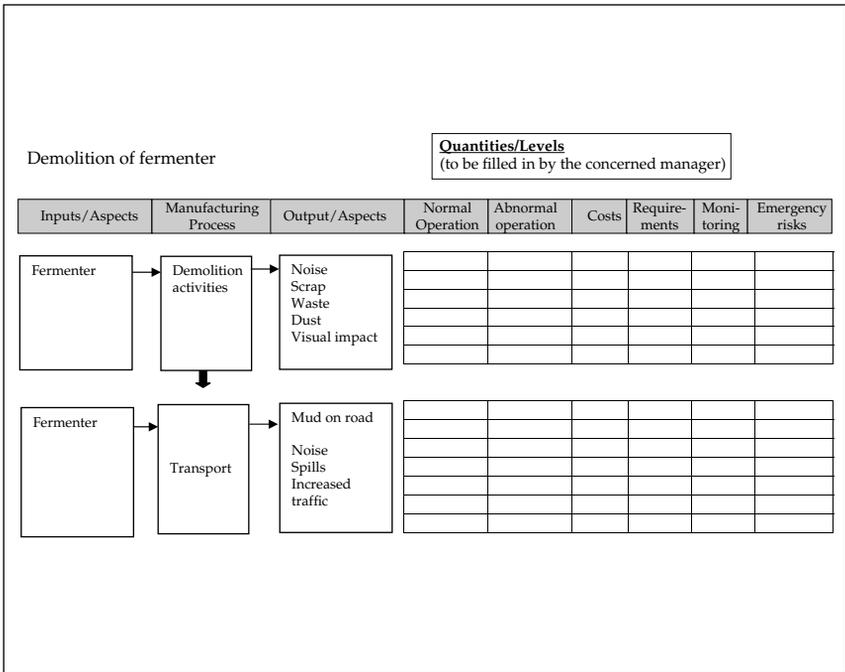
SOP no.: EMS-4.3.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.3.2 (4)

Example of an Environmental Flow Chart for a Construction Site



Remarks: _____

Reviewed by: _____
 (EMS Coordinator) **Signature** **Date**

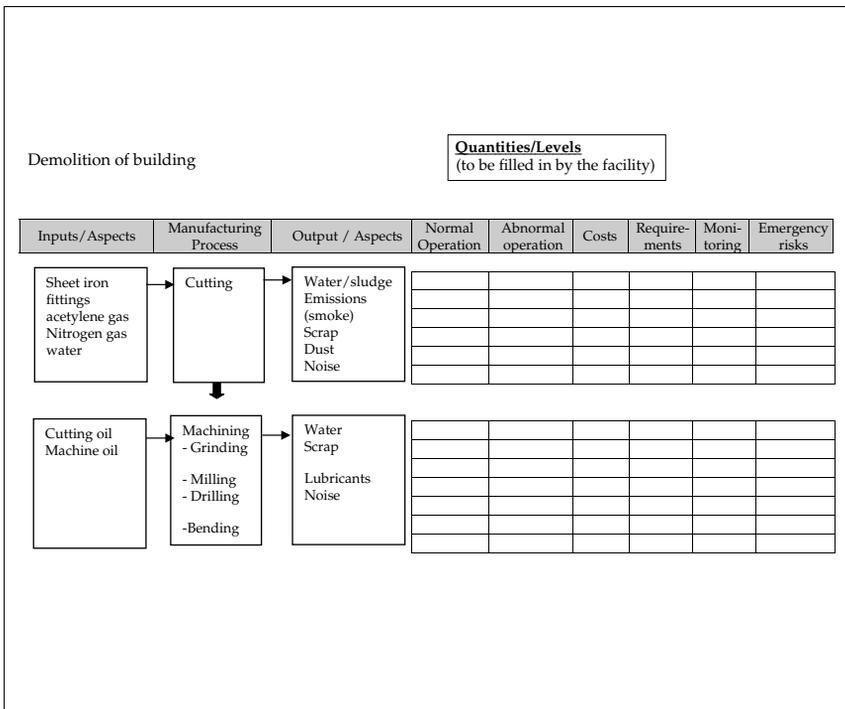
SOP no.: EMS-4.3.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.3.2 (5)

Example of an Environmental Flow Chart



Remarks: _____

Reviewed by: _____

(EMS Coordinator) **Signature** **Date**

SOP no.: EMS-4.3.2

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Revision no.: New

Attachment no. 4.3.2 (6)

Example of Discharges from a Manufacturing Facility

		Annual quantity	Monitoring weekly
A Discharge to sewer	2000 m ³		
B Cooling water to watercourse	160 kg		
C Oil from oil separator	-		
D Emission to air (welding smoke)	100 kg		
E Emission to watercourse	-		
F Emission of VOC from paint booth	13 t		
G Solid waste	2000 t		
H Liquid hazardous waste	50 t		

Remarks: _____

Reviewed by: _____
 (EMS Coordinator) **Signature** **Date**

300.30-6

Objectives and Targets

STANDARD OPERATING PROCEDURE

SUBJECT: Objectives and Targets		SOP no.: EMS-4.3.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
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Purpose

To describe a procedure for identifying objectives and targets in accordance with clause 4.3.3 of ISO 14001:2004 standard and local regulatory requirements.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure

Note: The concerned responsible for product, activity, and services shall define objectives and targets in coordination with his manager, refer to Attachment no. 4.3.3 (1). Summary of the objectives and targets will be reviewed by EMS coordinator and approved by the general manager to define environmental policy.

STANDARD OPERATING PROCEDURE

SUBJECT: Objectives and Targets		SOP no.: EMS-4.3.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
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1. Objectives are established to meet the organization's environmental policy. These objectives are the overall goals for environmental performance identified in the environmental policy. When establishing objectives, an organization has taken into account the relevant findings from environmental reviews, and the identified environmental aspects and associated environmental impacts.
2. Environmental targets are then set to achieve these objectives within a specified time frame. The targets are specific and measurable.
3. The objectives and targets are based on measurable environmental performance indicators. These indicators are used as the basis for an environmental performance evaluation system and provide information on both the environmental management and the operational systems.
4. Objectives and targets are applied broadly across an organization and more narrowly to site-specific or individual activities. Appropriate levels of management have defined the objectives and targets. Objectives and targets are periodically reviewed and revised, and taken into consideration the views of interested parties.
5. The issues considered in environmental objectives and targets
 - Objectives and targets reflect both the environmental policy and significant environmental impacts associated with the organization's activities, products, or services.
 - The employees responsible for achieving the objectives and targets had input into their development.
 - The views of interested parties have been considered.
 - Specific measurable indicators have been established for objectives and targets.

STANDARD OPERATING PROCEDURE

SUBJECT: Objectives and Targets		SOP no.: EMS-4.3.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
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- Objectives and targets regularly reviewed and revised to reflect desired improvements in environmental performance.
6. Objectives include commitments to
- Reduce waste and the depletion of resources
 - Reduce or eliminate the release of pollutants into the environment
 - Design products to minimize their environmental impact in production, use, and disposal
 - Control the environmental impact of sources of raw materials
 - Promote environmental awareness among employees and the community
7. Progress toward the objectives is generally be measured using environmental performance indicators such as
- Quantity of raw materials or energy used
 - Quantity of emissions such as CO₂
 - Waste produced per quantity of finished product
 - Efficiency of materials and energy use
 - Number of environmental incidents (e.g., excursions above limits)
 - Number of environmental accidents (e.g., unplanned releases)
 - Percentage waste recycled
 - Percentage recycled material used in packaging
 - Number of vehicle kilometres per unit of production
 - Specific pollutant quantities, for example, NO_x, SO₂, CO, HC, Pb, CFCs

STANDARD OPERATING PROCEDURE

SUBJECT: Objectives and Targets		SOP no.: EMS-4.3.3
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- Investment in environmental protection
 - Number of prosecutions
 - Land area set aside for wildlife habitat
8. The objectives and targets should be consistent with commitment to continual improvement program.

Documentation

1. For objectives and targets, refer to Attachment no. 4.3.3 (1)
2. Summary of objectives and targets, refer to Attachment no. 4.3.3 (2)

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.3.3

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.3.3 (1)

Objectives and Targets

Significant Aspect Priority No.

Prepared by: Concerned Responsible

Significant Environmental Aspect/Impact	
Objective:	Consistent to continual improvement YES <input type="checkbox"/> NO <input type="checkbox"/>
Indicator:	
Target:	Consistent to continual improvement YES <input type="checkbox"/> NO <input type="checkbox"/>
Policy Drafted:	
Action:	

Concerned Manager
(Coordinator)

_____ Signature

_____ Date

Reviewed by:
(EMS Coordinator)

_____ Signature

_____ Date

SOP no.: EMS-4.3.3

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.3.3 (2)

Summary of Objectives and Targets

Copy to: Concerned Responsibility

Significant Aspect Identified	Significant Aspect Priority No.	Impact	Objective	Target	Indicator	Policy (Priority)	Prepared by Concerned Manager
Activities							
Product							
Services							

Reviewed by:
(Coordinator)

Signature

Date

Approved by:
(EMS Coordinator)

Signature

Date

300.30-7

Environmental Management Program(s)

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Management Program(s)		SOP no.: EMS-4.3.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe a procedure to establish environmental program(s) in accordance with clause 4.3.4 of ISO 14001:2004 standard and local regulatory requirements.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure Clause

1. This is the responsibility of the concerned manager to develop the program in coordination with the EMS coordinator for each policy. The EMS coordinator shall review the program every month.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Management Program(s)		SOP no.: EMS-4.3.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
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2. Within the general planning of activities, an organization has established an environmental management program that addresses all of its environmental objectives. To be most effective, environmental management planning is integrated into the organizations strategic plan. Environmental management programs address schedules, resources, and responsibilities for achieving the organizations environmental objectives and targets.
3. Within the framework provided by the environmental management planning, an environmental management program identifies specific actions in order of their priority to the organization. These actions may deal with individual processes, projects, products, services, sites, or facilities within a site.
4. Environmental management programs help the organization to improve its environmental performance. They are dynamic and revised regularly to reflect changes in organizational objectives and targets.
5. The issues considered in environmental management program(s)
 - The organizations process for developing environmental management programs.
 - Instrument of all responsible parties in environmental management planning process.
 - Periodic review of the program.
 - Addressing the issues of resources, responsibility, timing, and priority in the program.
6. The following is an example of a process for developing an environmental management program.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Management Program(s)		SOP no.: EMS-4.3.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
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Example No. 1

- Policy : Conserve natural resources of water
- Objective : Minimize water use wherever technically and commercially practical.
- Target : Reduce water consumption at selected sites by 15% of the present levels with one year.
- Program : Water reuse.
- Action : Install equipment to recycle water used for rinsing in process A for reuse in process B.

Example No. 2

- Policy : Our company will seek to reduce electrical consumption and improve an energy efficiency where possible.
- Objective : Reduce electrical consumption by 30% of the present level by year 2005, using 1999 standard.
- Target : Reduce electrical consumption 10% in year 2000 (Production)
 - 5% in year 2001 (Packaging)
 - 5% in year 2002 (Maintenance)
 - 4% in year 2003 (Turbines)
 - 3% in year 2004 (Pumps)
 - 2% in year 2005 (Air Conditioning)
- Program : Resources optimization
- Action : Install energy-saving devices at selected sites.
Increase staff awareness to save electricity.
Increase production batch sizes to save energy consumption.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Management Program(s)		SOP no.: EMS-4.3.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
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Documentation

1. Refer to attachment EMS 4.3.4 (filled example).

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

Attachment no. 4.3.4 (1)

Environmental Management Program

Copy to: Concerned Responsible

Policy No.

1.	Policy statement, for example, Minimize water use whenever technically and commercially feasible							
2.	Description of objective, for example, Reduce water consumption at selected sites by 50,000 m ³ from present level within one year							
3.	Description of target, for example, Carry out a program if investigations to measure the use of water at different parts of process. Install the necessary equipment to tackle the worst three users by October next year.							
4.	Summary: As above							
	Aspect	Environmental Impact	Legal Nonconform	Internal standard Nonconform	Severity	Priority	Location	Refer to site plan
	Natural sweet water	Wastage of natural resources	None	None	Medium	Medium	Process assembly	Drawing No. 1

5.	Program, for example, install equipment to recycle rinse water for process "A" for reuse in process "B" by (Objective) October next year to be carried out by the production manager.				
	Target March 2000	How (Means) Process Review	Responsibility Production	When February 2000	Achieved on
6.	Monitoring:				
	Target April 2000	Indicator Water consumption	Frequency Weekly	Responsibility Production	Refer Record Production File
7.	Cost and Investment				
	Target October 2000	Internal cost US\$50,000	External cost US\$200,000	Savings US\$50,000	Return 25%/year
8.	Follow-up • Objective achieved : _____ YES _____ Date : _____ mm/dd/yy _____ • Time frame respected : _____ YES _____ Date : _____ mm/dd/yy _____ • Corrective action: _____ NONE _____ Date : _____ mm/dd/yy _____ • Comments: _____ Satisfaction, Policy in _____ _____				

Reviewed by:
(EMS Coordinator)

Signature

Date

300.30-8

Implementation and Operation

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Implementation and Operation		SOP no.: EMS-4.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
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Purpose

To describe a procedure for implementing and operation of EMS in accordance with clause 4.4 of ISO 14001:2004 standard and local regulatory requirements.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. ISO 14001 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure

Note: This is the responsibility of all concerned to participate in the implementation of EMS program as appropriate. EMS coordinator is responsible for the procedure compliance.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Implementation and Operation		SOP no.: EMS-4.4
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1. For effective implementation, an organization has developed the capabilities and support mechanisms necessary to achieve its environmental policy, objectives, and targets.
2. The capabilities and support required by the organization constantly evolve in response to the changing requirements of interested parties, a dynamic business environment, and the process of continual improvement. To achieve its environmental objectives and organization has focused and align its people, systems, strategy, resources, and structure.
3. The implementation of environmental management has been approached in stages and is based on the level of awareness of environmental requirements, aspects, expectations and benefits, and the availability of resources.

4. Resources—Human, physical, and financial

The appropriate human, physical (e.g., facilities, equipment), and financial resources essential to the implementation of an organization's environmental policies and the achievement of its objectives are defined and made available. In allocating resources, organizations have developed procedures to track the benefits as well as the costs of their environmentally or related activities. Insures such as the cost of pollution control, wastes, and disposal are included.

5. Issues considered in human, physical, and financial resources
 - Identify and allocate the human, technical, and financial resources necessary to meet its environmental objectives and targets, including those for new projects.
 - Tracking the costs and benefits of environmental activities.

**STANDARD OPERATING PROCEDURE
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SUBJECT: Implementation and Operation		SOP no.: EMS-4.4
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6. In order to manage these constraints the company, wherever possible, consider cooperative strategies with
 - Larger client organizations to share technology and know-how.
 - Other organizations on a supply chain or local basis to define and address common issues, to share know-how, to facilitate technical development, to use facilities jointly, to establish a way to study the EMS, to collectively engage a consultant.
 - Standardization organizations, associations, chambers of commerce, for training and awareness programs.
 - Universities and other research centers to support production and innovation.

7. To effectively manage environmental concerns, the EMS elements are designed or revised so that they are effectively aligned and integrated with the existing management system elements.

Management systems that have benefited from integration include:

 - Organization policies
 - Resource allocation
 - Operational controls and documentation
 - Information and support systems
 - Training and development
 - Organization and accountability structure
 - Reward and appraisal system
 - Measuring and monitoring systems
 - Communication and reporting

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Implementation and Operation		SOP no.: EMS-4.4
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8. Issues considered in organizational alignment and integration.
 - Environmental management system integration into the overall business management process.
 - Balancing and resolving conflicts between environmental and other business objectives and priorities.
9. Responsibility for the overall effectiveness of the EMS is assigned to (a) senior person(s) or function(s) with sufficient authority, competence, and resources, i.e., EMS-Coordinator.
10. Operational managers have clearly defined the responsibilities of relevant personnel and are responsible and accountable for effective implementation of EMS and environmental performance. Employees at all levels are accountable, within the scope of their responsibilities, for environmental performance in support of the overall environmental management system.
11. Issues considered in accountability and responsibility.
 - a. The responsibilities and accountability of personnel who manage, perform, and verify work affecting the environment, and these are defined and documented.
 - b. Relationship between environmental responsibility and individual performance and this is periodically reviewed.
 - c. Responsible and accountable personnel
 - Obtain sufficient training, resources, and personnel for implementation
 - Initiate action to ensure compliance with environmental policy
 - Anticipate, identify, and record any environmental problems

**STANDARD OPERATING PROCEDURE
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- Initiate, recommend, or provide solutions to those problems
 - Verify the implementation of such solutions
 - Control further activities until any environmental deficiency or unsatisfactory condition has been corrected
 - Obtain appropriate training to act in emergency situations
 - Gain an understanding of the consequences of non-compliance
 - Gain an understanding of the accountability that applies to them
 - Encourage voluntary action and initiatives
12. To ensure effective development and implementation of an EMS appropriate responsibilities are assigned. It should be recognized that companies and institutions have different organizational structures, and need to understand and define environmental responsibilities based upon their own work processes.

Documentation

1. Personnel and responsibilities, refer to Attachment no. 4.4 (1)
2. Structure and responsibility, refer to Attachment no. 4.4 (2)
3. Resources allocation, refer to Attachment no. 4.4 (3)
4. General implementation process, refer to Attachment no. 4.4 (4)
5. Example job description EMS coordinator, refer to Attachment no. 4.4 (5)

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Implementation and Operation		SOP no.: EMS-4.4
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Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.4

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4 (1)

Personnel and Responsibilities

Copy to: Concerned Responsible

Sample Environmental Responsibilities	Typical Person(s) Responsible
Establish overall direction	General manager, chief executive officer (CEO), board of directors
Develop environmental policy	President, chief environmental management system controller
Develop environmental objectives, targets, and programs	Relevant managers
Monitor overall EMS performance	Environmental system coordinator
Assure regulatory compliance	Senior operating manager
Ensure continual improvement	All managers
Identify customers expectations	Sales and marketing staff
Identify suppliers expectations	Purchasers, buyers
Develop and maintain accounting procedures	Finance/accounting managers
Comply with defined procedures	All staff

Note: In the case of SMEs, the person responsible can be the owner.

SOP no.: EMS-4.4

Issue date: mm/dd/yyyy

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Attachment no. 4.4 (2)

Structure and Responsibility

EXAMPLE

To: Person Concerned

From: Concerned Manager

Job Title: <u>EMS Coordinator</u>	Reporting to: <u>General Manager</u>
Department: <u>Engineering</u>	Qualification: <u>B.Sc. Environmental Science</u>
Summary (Job Title): <u>Maintain, monitor, and control the elements of EMS</u>	
<hr/>	
Responsibilities	
<ol style="list-style-type: none"> 1. Maintain a list of environmental aspects, in particular the significant environmental aspects. 2. Maintain a list of environmental training records. 3. Keep records of proposals for new environmental objectives. 4. Follow-up the progress toward environmental objectives. 5. Coordinate and maintain the process for regular identification and updating of environmental objectives and targets. 6. Maintain contacts with governmental authorities. 7. Prepare the documentation necessary for the management reviews. 8. Report on environmental management at the management review meetings. 9. Coordinate EMS audits. 10. Consolidate environmental reports, for example, to authorities. 11. Prepare the environmental statement if the facility is registered to EMAS. 12. Report on regulatory compliance to top management. 13. Prepare documents needed for the management review meetings. 	
Authorization	
Authorized to stop any activity, product, or services not in compliance with the environmental protection.	
Approved by: _____ Accepted by: _____	

Reviewed by:

(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.4

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4 (3)

Resources Allocation

To: Concerned Manager

From: Personnel Manager

Policy No.:
1. Personnel Resources <ul style="list-style-type: none"> • Job title • Personnel qualification • Practical experience • Training received • Computer awareness • Personnel character
2. Financial resources (Provide details): <ul style="list-style-type: none"> • Equipment cost • Personnel cost
3. Redirection of existing personnel
4. Training requirements
5. Benefits for the company
6. Personnel motivation

Reviewed by:

(EMS Coordinator)

Signature

Date

Approved by:

(General Manager)

Signature

Date

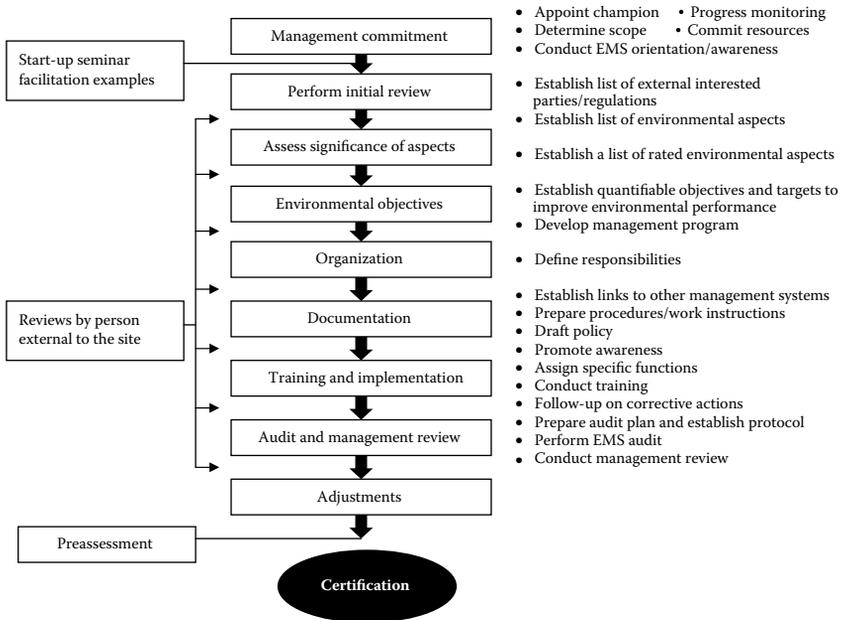
SOP no.: EMS-4.4

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4 (4)

General Implementation Process



SOP no.: EMS-4.4

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4 (5)

Example Job Description of EMS Coordinator

The list contains examples of the ISO 14001 elements that usually the EMS coordinator (or any other person who has been given the responsibility to document the EMS) is responsible for.

Issue	Activity/Responsibility
Policy	<ul style="list-style-type: none"> • Coordinate the establishment of a site-specific environmental policy that is relevant to the facility's size and activities. • Ensure that the local environmental policy is in line with the company policy for environmental protection. • Ensure that the local environmental policy fulfills the requirements of ISO14001, e.g., it shall contain commitments to continual improvement and compliance with relevant environmental legislation. • Document the procedure for the environmental policy.
Environmental aspects	<ul style="list-style-type: none"> • Coordinate and document the initial review. This process can be more or less comprehensive depending on how well the processes are documented. • Develop a site-specific model for how to assess the significance of the environmental aspects. • Document the procedure for identifying environmental aspects.
Legal requirements	<ul style="list-style-type: none"> • Ensure that the organization has procedures for regular updating of relevant regulatory requirements. • Establish a list of how the legal requirements are applied to the organization, that is, a list containing the laws and the environmental aspects, for example, emissions, where laws are applicable to the organization.
Environmental objectives	<ul style="list-style-type: none"> • Establish a list of environmental objectives and programs that have recently been completed. • Establish procedures for how to identify environmental objectives and programs within all relevant functions of the organization. • Establish a list of on-going environmental objectives and programs. • Document the procedure for setting environmental objectives.

Issue	Activity/Responsibility
Environmental programs	<ul style="list-style-type: none"> • Confirm that all environmental objectives have programs setting out how the objective and targets are to be achieved. • Document the procedure for environmental programs.
Environmental organization	<ul style="list-style-type: none"> • Identify activities and functions that may have a significant impact on the organization's environmental performance. • Delegate responsibilities.
Education and training	<ul style="list-style-type: none"> • Ensure that functions needing special education and training are identified. • Identify training requirement for functions that may have a significant environmental impact. • Coordinate EMS general training. • Coordinate function specific training. • Establish procedure for retaining of training records.
Communication	<ul style="list-style-type: none"> • Ensure that the environmental policy and the significant environmental objectives are communicated to the whole organization. • Coordinate formal delegation of environmental responsibilities and authorities. • Establish the procedure for external and internal communication.
EMS documentation	<ul style="list-style-type: none"> • Describe the elements of the EMS, for example, types of documents. • Describe the organization and its environmental aspects. • Maintain the EMS documentation, that is, regular updating.
Document control	<ul style="list-style-type: none"> • Establish a procedure for document control, for example, refer to the corresponding procedure within the quality system. • Establish a list of environmental documents and the recipients of documents.
Processes	<ul style="list-style-type: none"> • Implement procedures for regular updating of environmental aspects, for example, environmental aspects of new or significantly modified manufacturing processes and new product lines. • Identify and list all processes that need to have documented procedures in order to control their environmental impacts. • Coordinate the documentation of procedures and instructions.
Emergency	<ul style="list-style-type: none"> • Coordinate an inventory of potential emergency situations. • Establish procedures for how to train emergency situations. • Document the procedure for emergency control.
Monitoring	<ul style="list-style-type: none"> • Identify those environmental aspects that are necessary to monitor in order to verify legal compliance. • Establish procedures for how to monitor environmental aspects. • Establish procedures for reporting regulatory compliance.
Nonconformance	<ul style="list-style-type: none"> • Establish procedures for how to handle nonconformance. • Verify that the nonconformance procedure is working.

Issue	Activity/Responsibility
Records	<ul style="list-style-type: none">• Establish procedures for how and where to retain environmental records.
Internal EMS audits	<ul style="list-style-type: none">• Establish a plan for when, and by whom, the internal system audits shall be conducted.• Establish procedures for how to document EMS audits.• Document the EMS audit procedure.
Management review	<ul style="list-style-type: none">• Establish a list of issues to be addressed and documented at the management review meetings.• Establish a schedule for when the management review meetings are to be conducted.• Document the management review procedure.

300.30-9

Resources, Roles, Responsibility, and Authority

STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE

SUBJECT: Resources, Roles, Responsibility, and Authority		SOP no.: EMS-4.4.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe a procedure for structure and responsibility in accordance with clause 4.4.1 of ISO 14001:2004 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. ISO 14001:2004 systems coordinator (environmental management system representative) is responsible for SOP compliance.

Procedure

1. This is the management responsibility to provide resources for establishing, implementing, maintaining, and improving the EMS.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Resources, Roles, Responsibility, and Authority		SOP no.: EMS-4.4.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

2. This is the responsibility of concerned managers to maintain and follow the structural responsibilities. EMS coordinator shall review periodically (every three months) the compliance.
3. Top management has a key role to play in building awareness and motivating employees by explaining the organizations environmental values and communicating its commitment to the environmental policy. The environmental management system coordinator is hired to maintain the system.
4. It is the commitment of the individual people, in the context of shared environmental values, that transforms an environmental management system from paperwork into an effective process.
5. Motivation to continually improve is enhanced when employees are recognized for achieving environmental objectives and targets and encouraged to make suggestions that leads to improved environmental performance.
6. Key elements considered in environmental awareness and motivation
 - a. How has top management established, reinforced, and communicated organizational commitment to the environmental policy.
 - b. To what extent do employees understand, accept, and share the environmental values of the organization.
 - c. To what extent do shared environmental values serve to motive environmentally responsible action.
 - d. Method to recognize employees' environmental achievements.
7. The EMS coordinator will review the structure and responsibility every quarter to keep it updated.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Resources, Roles, Responsibility, and Authority		SOP no.: EMS-4.4.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Documentation

1. Structure and responsibility, refer to Attachment no. 4.4.1 (1)
2. Supplier questionnaire, refer to Attachment no. 4.4.1 (2)

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.1 (1)

Structure and Responsibility

Copy to: Concerned Responsible

Elements	Prepared by (Concerned Managers)	Frequency of Review	Remarks
<ol style="list-style-type: none"> 1. Organization chart personnel qualification 2. Resources identified and availed for establishing, implementing, maintaining and improving EMS 3. Personnel qualifications 4. Job description 5. Training of staff to increase environmental awareness by <ul style="list-style-type: none"> • Internal means • External means 6. Motivation schemes <ul style="list-style-type: none"> • Financial • Nonfinancial 7. Communication to employees by <ul style="list-style-type: none"> • Slogans • Sign boards • Pictures • Memos 8. Staff goals and objectives based on EMS objectives and targets <ul style="list-style-type: none"> • Management review • New objectives and targets • Corrective actions follow-up • Audit findings follow-up 9. Interested parties <ul style="list-style-type: none"> • Supplier • Questionnaire 			

Reviewed by:

(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.1 (2)

Supplier Questionnaire

- | | Yes | No |
|---|--------------------------|--------------------------|
| 1. Are you registered acc. to EMAS?
If yes, please send us your environmental report | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Are you certified to ISO 14001 of BS 7750? | <input type="checkbox"/> | <input type="checkbox"/> |

If either of the above questions have been answered with “yes,” you don’t have to reply to the following questions.

- | | | |
|--|--------------------------|--------------------------|
| 3. Are you planning to implement a certified environmental management system
If so, which and when? | <input type="checkbox"/> | <input type="checkbox"/> |
| Date: _____ | | |

- | | | |
|---|--------------------------|--------------------------|
| 4. Do you have an environmental policy?
If yes, please send us your policy. | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Have you undertaken an external or internal environmental audit?
If yes, please send us a summary of your program. | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Do you have an up-to-date environmental impact assessment?
If yes, please send us a summary of your program. | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Do you have an up-to-date environmental impact assessment?
If yes, please send us a copy.
If no, please describe briefly below what kind of environmental impacts your operations cause. | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Do you need consent, authorization environmental permit to operate? | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Have you an environmental contact person? | <input type="checkbox"/> | <input type="checkbox"/> |

Name, title

- | | | |
|---|--------------------------|--------------------------|
| 10. Do you educate your staff in environmental issues? | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Do you have any sites for surface treatment, metal plating, pickling, etc.? | <input type="checkbox"/> | <input type="checkbox"/> |

- | | Yes | No |
|--|--------------------------|--------------------------|
| 12. Do you have formal procedures for handling of hazardous waste from your sites? | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Did you receive instruction from our company to be in compliance with our EMS program during operations by your staff at our site. | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Other comments and responses to questions 1 to 13, if any | | |

300.30-10

Training Awareness and Competence

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Training Awareness and Competence		SOP no.: EMS-4.4.2
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe a procedure for developing competence, training and awareness in accordance with clause 4.4.2 of ISO 14001:2004 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure

This is the responsibility of the concerned manager to identify the training needs, develop and implement comprehensive training program. EMS coordinator shall review the program every quarter.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Training Awareness and Competence		SOP no.: EMS-4.4.2
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

1. The knowledge and skills necessary to achieve environmental objectives are identified. These are considered in personnel selection, recruitment, training, development of skills, and ongoing education.
2. Appropriate training relevant to the achievement of environmental policies, objectives, and targets are provided to all personnel within an organization.
3. Employees (persons working for, or on behalf of the organization, could include contractors and temporary staff) have an appropriate knowledge base, which includes training in the methods and skills required to perform their tasks in an efficient and competent fashion and knowledge of the impact their activities can have on the environment if performed incorrectly.
4. The organization ensures that contractors working at the site provide evidence that they have the requisite knowledge and skills to perform the work in an "environmentally responsible manner."
5. Education and training provided to ensure that employees have appropriate and current knowledge of regulatory requirements, internal standards and the organizations policies and objectives. The level and details of training vary according to the tasks.
6. Training programs comprise the following elements:
 - Identification of employee training needs
 - Development of a training plan to address defined needs
 - Verification of conformance of training program to regulatory or organizational requirements
 - Training of target employee groups

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Training Awareness and Competence		SOP no.: EMS-4.4.2
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

- Documentation of training received
- Evaluation of training received

7. Key elements considered in knowledge, skills, and training

- a. Identification of training needs by the organization
- b. Analysis of specific job functions related to training needs
- c. Development and review and modification of training needs as needed
- d. Training documentation and track

Documentation

1. For training program development, refer to Attachment no. 4.4.2 (1).
2. For training program, refer to Attachment no. 4.4.2 (2).
3. Training program and record, refer to Attachment no. 4.4.2 (3).

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.4.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.2 (1)

Copy To: All Concerned

Examples of the types of environmental training which can be provided by the organization are as follows:		
Type of Training	Audience	Purpose
Raising awareness of the strategic importance of environmental management	Senior management	To gain commitment and alignment to the organizations environmental policy
Raising general environmental awareness	All employees <ul style="list-style-type: none"> • In-house • Contractors • Temporary • Visitors • Trainees, etc. 	To gain commitment to the environmental policy, objectives and targets of the organization and instill a sense of individual responsibility
Skills enhancement	Employees with environmental responsibilities	To improve performance in specific areas of the organization, e.g., operations, research, and development and engineering
Compliance	Employees whose actions can affect compliance	To ensure regulatory and internal requirements for training are met

SOP no.: EMS-4.4.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.2 (2)

Example List of Operations and Competence, Requirements

Environmental Aspect	Activity	Min. Training Level
Emission of dust	Maintenance of bag-filters	Filter training course provided by the filter manufacturer
Noise from fan test	Measurement of noise level	Training on noise detector provided to new employee

SOP no.: EMS-4.4.2
 Issue date: mm/dd/yyyy
 Revision no.: New

Attachment no. 4.4.2 (3)

Copy To: All Concerned

Name: _____ Responsibility: _____ Job title: _____

Qualification: _____ Location: _____ Department: _____

Programs	Training Procedure	Training Tools	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Signature	Remarks
• Environmental awareness																
• Aspects identification																
• Impact analysis																
• ISO 14001 standard																
• Environmental regulatory requirements																
• Specific skills and techniques																
• Specific equipment operation																
• Reorientation																
• SOP reading																
• Emergency handling																
• Fire fighting																
• First aid																
• Evacuation drill																
• Others																

Trainer _____
 Signature _____ Date _____

Training Reviewed by: _____
 EMS Coordinator _____ Signature _____ Date _____

300.30-11

Communication

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Communication		SOP no.: EMS-4.4.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe a procedure for developing EMS communication in accordance with clause 4.4.3 of ISO 14001:2004 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure

1. Communication includes establishing processes to report internally and, where desired, externally (pro-actively) on the environmental activities of the organization in order to

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Communication		SOP no.: EMS-4.4.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

- Demonstrate management commitment to the environment
 - Deal with concerns and questions about the environmental aspects of the organizations activities, products, or services
 - Raise awareness of the organizations environmental policies, objectives, targets, and programs
 - Inform internal or external interested parties about the organizations environmental management system and performance as appropriate
2. Results from EMS monitoring, audit and management review are communicated to those within the organizations who are responsible for performance.
 3. The provision of appropriate information to the organizations employees and other interested parties serves to motivate employees and encourage public understanding and acceptance of the organizations efforts to improve its environmental performance.
 4. Key elements considered in communication and reporting
 - a. Process for receiving and responding to employee concerns
 - b. Process for receiving and considering the concerns of other interested parties
 - c. Communication of the organization's environmental policy and performance
 - d. Communication of results from EMS audits and reviews communicated to all appropriate people in the organization
 - e. Procedure for making the environmental policy available to the public

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Communication		SOP no.: EMS-4.4.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

- f. Review of internal communication to ensure that it is adequate to support continual improvement around environmental issue
5. Items included in reports
- Organizations profile
 - Environmental policy, objectives, and targets
 - Environmental management processes (including interested party involvement and employee recognition)
 - Environmental performance evaluation (including releases, resource conservation compliance, product stewardship, and risk)
 - Opportunities for improvement
 - Supplementary information, such as glossaries
 - Independent verification of the contents
6. For both internal and external environmental communication and reporting
- Two-way communication is encouraged.
 - Information is understandable and adequately explained.
 - Information is verifiable.
 - The organization presents an accurate picture of its performance.
 - Information is presented in a consistent form (e.g., similar units of measurement to allow for comparison between one period and another).

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Communication		SOP no.: EMS-4.4.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

7. The environmental information is communicated using the following:

- Externally, through an annual report, regulatory submissions, public government records, industry association publications, the media, and paid advertising
- The publication of telephone numbers where complaints and questions can be directed
- Internally, though bulletin board postings, internal newspapers, meetings, and electronic mail messages

Documentation

1. Communication, refer to Attachment no.: 4.4.3.

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

300.30-12

Environmental Management System Documentation

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Management System Documentation		SOP no.: EMS-4.4.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for the environmental management system documentation in accordance with clause 4.4.4 of ISO 14001:2004 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. The ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Management System Documentation		SOP no.: EMS-4.4.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Procedure

Note: The departmental managers are responsible to prepare a list of critical EMS-related documents and the EMS coordinator shall review.

1. The company has established the summary of connected procedures to have an effective and meaningful Environmental Management System.
2. The ISO 14001:2004 specially requires specific reference documents in the following clauses:
 - a. 4.3.3 Objectives and targets
 - b. 4.4.1 Structure and responsibility
 - c. 4.4.4 EMS documentation including description of the scope of the EMS in the system documentation
 - d. 4.4.6 Operational control
 - e. 4.5.1 Monitoring measurement
 - f. 4.6 Management review
 - g. 4.3.1 Significant environmental aspects
3. The management has established and maintained information in paper and in electronic form as appropriate, to provide core elements of the management system and provide direction to related documentation.
4. The EMS auditor can document the procedure, work instruction as an objective evidence of adequate planning and control.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Management System Documentation		SOP no.: EMS-4.4.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

5. The organization plans (these) activities, including maintenance, in order to ensure that they are carried out under specified conditions.
6. The company has established and maintained documented procedures to cover situations where their absence could lead to deviations from the environmental policy and the objectives and targets. The key documents are described in Step 2.
7. The following is the hierarchy of EMS documentation in the company.
 - Level 1—The “Signposting” document
 - Level 2—System procedures
 - Level 3—Operational procedures and technical “instructions”
 - Level 4—Data, records, etc.
8. The “signposting” document of the company is the top-level document and is, above all, a descriptive document for the company. It is the actual environmental policy and the following documents are described in the EMS manual.
 - Structure, responsibility, and authority descriptions.
 - Objectives and targets to define improvements goals.
 - A description of the company (as appropriate).
 - An outline of its operation.
 - Its relationship with other “linked” organizations.
 - A description of the core elements of the EMS and their interaction.
 - Reference to other supportive elements and documentation.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Management System Documentation		SOP no.: EMS-4.4.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

9. The system procedures define the “day-to-day” activities relevant to an area, department, function, and so on that are required to ensure that the management system operates effectively. In general, they relate to “management” and/or “supervisory” issues, communications, and interfaces. (Documentation of detailed task-level actions for individuals is generally better served by operational procedures/technical instructions.)

e.g. Purchasing

Document control

Supplier evaluation and approval

Calibration

10. The operational procedures/technical instructions define the who, what/which, where, and when of an activity requiring control, but tend to be aimed toward discrete tasks and individual(s) performing them.

11. Legal and regulatory compliance procedures define methods of work/test/monitoring that require complying with mandated methods defined with external, regulatory documents.

12. Other interested parties’ methods are also defined and maintained separately.

13. Document control is ensured through

- The right information is available
 - In the right place
 - At the right time
 - In the right revision

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Management System Documentation		SOP no.: EMS-4.4.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

14. The control and handling of documentation is ensured through reviews and approvals by authorized personnel.
15. That the obsolete documents are
 - Removed from the possibility of use.
 - Retained if required at a suitable location.
 - Identified as such.
16. All controlled documentation contain
 - A clear identifier as to
 - Subject
 - SOP no.
 - Distributed to
 - Based on
 - Revision no.
 - Written by
 - Checked by
 - Approved by
 - Date supersedes
 - Date issued
 - Page
 - Purpose
 - Responsibility
 - Procedure (details)
 - Reason(s) for revision

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Environmental Management System Documentation		SOP no.: EMS-4.4.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Documentation

1. Critical documentation index, refer to Attachment no. 4.4.4 (1).

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.4.4

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.4 (1)

Critical Documents Index

Key Procedures	Responsibility (Departmental Manager)
<ul style="list-style-type: none">• Environmental policy• Identifying environmental aspects• Setting environmental objectives• Description of the scope of the EMS• Environmental programs• Retention of training records• Internal and external communication• Processing instructions• Emergency control• Regulatory compliance• Monitoring• Nonconform investigation• Change control• Corrective action and preventive measures• Calibration• Environmental monitoring records• Auditing• Management review• Complaints• Interested parties	

Reviewed by:
(EMS Coordinator)

Signature

Date

300.30-13

Document Control

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Document Control		SOP no.: EMS-4.4.5
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for document control in accordance with clause 4.4.5 of ISO 14001:2004 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. The ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure

Definition: Information and its supporting medium (paper, magnetic, electronic, or optical computer disc, photograph or master sample, or a combination thereof).

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Document Control		SOP no.: EMS-4.4.5
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

1. Operational processes and procedures are defined appropriately, documented and updated as necessary.
2. The organization has clearly defined the various types of documents that establish and specify effective operational procedures and control.
3. The existence of EMS documentation supports employees awareness of what is required to achieve the organizations environmental objectives and enables the evaluation of the system and environmental performance.
4. The environmental documentation is integrated into existing documentation. For ease of use, the organization has considered organizing and maintaining a summary of the documentation to
 - Collate the environmental policy, objectives, and targets
 - Describe the means of achieving environmental objectives and targets
 - Document the key roles, responsibilities, and procedures
 - Provide direction to related documentation, and describe other elements of the organization are implemented
5. Key elements considered in EMS documentation
 - a. The environmental management procedures are identified, numbered, documented, communicated, and revised.
 - b. Process for developing and maintaining EMS documentation.
 - c. EMS documentation integration with existing documentation where appropriate.
 - d. Employees' access to EMS documentation needed to conduct their job activities.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Document Control		SOP no.: EMS-4.4.5
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

6. All documentation is dated (with dates of revision), readily identifiable, organized, and retained for a specified period. The organization should ensure that
 - Documents are identified with the appropriate organization, division, function, activity, and/or contact person.
 - Documents are periodically reviewed, revised as necessary and approved by the authorized personnel prior to issue.
 - The current versions of relevant documents are available at all locations where operations essential to the effective functioning of the system are performed.
 - Obsolete documents are promptly removed from all points of issue and points of use.
7. The documents of external origin shall be determined by the management to be essential for the planning and operation of the EMS. The distribution of such documents shall be controlled.
8. The general documentation hierarchy is as follows:

Policy
Manual
Procedure
Instructions
Result Documents

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Document Control		SOP no.: EMS-4.4.5
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Documentation

1. EMS documentation, refer to Attachment no. 4.4.5 (1)
2. Procedures index, refer to Attachment no. 4.4.5 (2)
3. SOP distribution record, refer to Attachment no. 4.4.5 (3)
4. Document retention time, refer to Attachment no. 4.4.5 (4)

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.4.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.5 (1)

Example of EMS Documentation

Manual	Procedure	Instructions	Results Documents
<p>4.4.6 Operation control, e.g., waste handling</p> <p style="text-align: center;">→</p> <p>The manual gives a short description of the principles for waste handling</p>	<p>Describes where and how waste is handled at the facility</p>	<ul style="list-style-type: none"> → Handling of liquid waste at dept. X → Handling of solid waste at dept. X → Waste storage at dept. X → Waste storage at dept. Y → Waste treatment → Waste transfer notes 	<p>Quantities type of waste</p>

Procedure/Instructions		
<ul style="list-style-type: none"> * Objective * Responsibility * Authority 	<ul style="list-style-type: none"> * Signature * Date 	<p>Direction to the next level in the hierarchy</p>

SOP no.: EMS-4.4.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.5 (2)

Procedures Index

Subject	Procedure no.	Issue Date

SOP no.: EMS-4.4.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.5 (4)

Document Retention Time

Document Description	Retention Time	Location	Responsibility

300.30-14

Operation Control

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Operation Control		SOP no.: EMS-4.4.6
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for operational control in accordance with Clause 4.4.6 of ISO 14001:2004 standard and local regulatory requirements.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. The ISO 14001:2004 system coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure

1. Implementation has been accomplished through the establishment and maintenance of operational procedures and controls to

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Operation Control		SOP no.: EMS-4.4.6
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

ensure that the organizations environmental policy, objectives, and targets can be met.

2. The organization has considered the different operations and activities contributing to its significant environmental impacts when developing or modifying operational controls and procedures. Such operations and activities include
 - Research and development design and engineering
 - Purchasing
 - Contracting
 - Handling and storage of raw materials
 - Production and maintenance processes
 - Laboratories
 - Storage of products
 - Transportation
 - Marketing and advertising
 - Customer service
 - Acquisition, construction, or modification of property and facilities
3. Activities are divided into three categories:
 - Activities to prevent pollution and conserve resources in new capital projects, process changes and resources management, property (acquisitions, divestitures, and property management), and new products and packaging

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Operation Control		SOP no.: EMS-4.4.6
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

- Daily management activities to assure conformance to internal and external organizational requirements and to ensure their efficiency and effectiveness
- Strategic management activities to anticipate and respond to changing environmental requirements

Documentation

1. Operational control list, refer to Attachment no. EMS-4.4.7

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.4.6

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.6 (1)

Operational Control

From: Concerned Manager

Operation	Procedure Available		Aspect		Impact	Remarks
			S	IS		
• Research and development	Yes	No				
• Designing and engineering	Yes	No				
• Purchasing	Yes	No				
• Contracting	Yes	No				
• Handling and storage of raw materials	Yes	No				
• Production and material process	Yes	No				
• Laboratories	Yes	No				
• Storage of product	Yes	No				
• Transportation	Yes	No				
• Marketing and advertising	Yes	No				
• Customer service	Yes	No				
• Acquisition	Yes	No				
• Construction	Yes	No				
• Modification	Yes	No				
– Property						
– Facilities						
• Contractors	Yes	No				

Note: S—Significant; IS—Insignificant

Reviewed by:

(EMS Coordinator)

Signature

Date

300.30-15

Emergency Preparedness and Response

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Emergency Preparedness and Response		SOP no.: EMS-4.4.7
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for developing emergency preparedness and response in accordance with clause 4.4.7 of ISO 14001:2004 standard and local regulatory requirements.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. The ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Emergency Preparedness and Response		SOP no.: EMS-4.4.7
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Procedure

1. Emergency plans and procedures have been established to ensure that there will be an appropriate response to unexpected or accidental incidents.
2. The organization has defined and maintained procedures for dealing with environmental incidents and potential emergency situations. The operating procedures and controls include, where appropriate, consideration of
 - Accidental emissions to the atmosphere
 - Accidental discharges to water and land
 - Specific environment and ecosystem effects from accidental release
3. The procedure have taken into account incidents arising, or likely to arise, as a consequence of
 - Abnormal operating conditions
 - Accidents and potential emergency situations
4. Emergency plans include
 - Emergency organizations and responsibilities
 - A list of key personnel
 - Details of emergency services (e.g., fire department, spill clean-up services)
 - Internal and external communication plans
 - Actions taken in the event of different types of emergencies

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Emergency Preparedness and Response		SOP no.: EMS-4.4.7
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

- Information on hazardous materials, including each materials potential impact on the environment, and measures to be taken in the event of accidental release
- Training plans and testing for effectiveness

Documentation

1. Emergency preparedness and resources, refer to Attachment no. 4.4.7 (1)
2. Emergency plan, refer to Attachment no. 4.4.7 (2)

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.4.7

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.7 (1)

Emergency Preparedness and Resources

To: All Concerned Managers

Task no.:	Date:	Prepared by: Concerned Manager
1. Historical review of incidents		Remarks
<ul style="list-style-type: none"> • Air pollution • Water pollution • Land pollution • Noise pollution • Nature of hazard • Pollution time • Transmissible • May occur under extreme condition • Lack of attention • May occur under normal condition • Nuisance potential <ul style="list-style-type: none"> - People - Business - Historical - Nature 		
2. Key personnel responsible		
3. Emergency organization and responsibilities		
4. Emergency-handling procedure		
5. Material safety data sheet		
6. Training material and program		
7. Emergency drills (testing of effectiveness)		

Reviewed by:

(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.4.7

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.7 (2)

Emergency Plan

To: All Concerned Managers

Emergency Type	Location	Responsibility	Reference Procedure	External Help	Key Telephone Number
ACTIVITY 1) 2) 3) 4) 5) 6)					
PRODUCT 1) 2) 3) 4) 5) 6)					
SERVICES 1) 2) 3) 4) 5) 6)					

Reviewed by:

(EMS Coordinator)

Signature

Date

300.30-16

Checking and Corrective Action

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Checking and Corrective Action		SOP no.: EMS-4.5
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for checking and corrective action in accordance with clause 4.5 of ISO 14001:2004 standard and local regulatory requirements.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. The ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure

1. In the event of noncompliance, the effective, corrective, and preventative action are established and documented.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Checking and Corrective Action		SOP no.: EMS-4.5
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

2. The noncompliance detected is extended for investigation and corrective action (as relevant)
 - Within the process
 - Within work operation/instructions
 - Via service reports
 - Via customer complaints
3. The major, minor, and critical defectives are identified and checked, which may adversely effect the environmental quality.
4. Measures are taken to prevent reoccurrence and documented.
5. All corrective action causes and resolutions are documented.
6. The corrective actions taken are recorded (as appropriate).
 - Documented evidence of individual occurrence
 - Minutes of management meetings
 - Changes to procedures (Reason for revision)
7. The records of product and system defects are analyzed to identify potential areas of non-conformance.
8. To eliminate potentate, nonconformance programs are developed and followed.
9. The changes to procedures and the results of preventive action are presented at management review meetings.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Checking and Corrective Action		SOP no.: EMS-4.5
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX



Documentation

1. Checking and corrective action, refer to Attachment no. 4.5 (1)
2. Minutes of management reviews, refer to EMS procedure 4.6
3. Change control records, refer to Attachment no. 4.5 (2)



Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5 (1)

Checking and Corrective Action

To: Concerned Manager

From: Responsible

1. Source	Details of Noncompliance
Activities Product Process Operational work Instructions Service report Customer complaint	<input type="checkbox"/> Major <input type="checkbox"/> Minor <input type="checkbox"/> Critical
2. In-process control	
3. Preventive measure	
4. Corrective action program	
5. Change control approval	
Concerned Manager	EMS Coordinator By: _____ <input type="checkbox"/> Yes <input type="checkbox"/> No
Remarks:	

Reviewed by:
(EMS Coordinator)

_____ Signature

_____ Date

SOP no.: EMS-4.5
Issue date: mm/dd/yyyy
Revision no.: New

Attachment no. 4.5 (2)

Change Control

To: Concerned Manager

From:

Date:

Element	Aspect		Proposed		Remarks
	Current Practice	Impact	Practice	Impact	
Activity					
Products					
Services					

Requires policy revision: _____

Requires objective revision: _____

Requires target revision: _____

Requires changes in program: _____

Reviewed by: _____
(EMS Coordinator) **Signature** **Date**

300.30-17

Monitoring and Measurement

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Monitoring and Measurement		SOP no.: EMS-4.5.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for monitoring and measurement in accordance with clause 4.5.1 of ISO 14001:2004 standard and local regulatory requirements.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. The ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Monitoring and Measurement		SOP no.: EMS-4.5.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Procedure

It is ensured to measure, monitor, and evaluate the environmental performance.

1. The organization has established, implemented, and maintained procedure(s) to monitor and measure key characteristics of operations of significant environmental impact (procedures shall include documentation of information to monitor performance; applicable operational controls and conformance to objectives and targets of the organization).
2. The system is in place for measuring and monitoring actual performance against the organizations environmental objectives and targets in the areas of management systems and operational processes. This includes evaluation of compliance with relevant environmental legislation and regulations. The results are analyzed and used to determine areas of success and to identify activities requiring corrective action and improvement.
3. The reliability of data is ensured by using calibrated instruments, test equipment, and software and hardware sampling and records are maintained.
4. Appropriate environmental performance indicators are identified for the organization as an ongoing process.
5. Such indicators are objective, verifiable, and reproducible.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Monitoring and Measurement		SOP no.: EMS-4.5.1
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

6. They are relevant to the organizations activities, consistent with its environmental policy, practical, cost effective, and technologically feasible.
7. Key factors considered in measuring and monitoring are the following:
 - a. Regular monitoring of environmental performance
 - b. Establishment of specific environmental performance indicators to relate to the organizations objectives
 - c. Establish procedures to regularly calibrate the sample measuring and monitoring equipment and systems
 - d. Process to periodically evaluate compliance with relevant legal and other compliances

Documentation

1. Monitoring and measurement, refer to Attachment no. 4.5.1

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.5.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5.1 (1)

Monitoring and Measurement

To: Concerned Manager

From: Concerned Responsible

Aspect	Monitoring Frequency	Procedure no.	Indicator	Limit	Results	Remarks
Activity <ul style="list-style-type: none"> • Regulatory requests • Significant aspects • Waste and scrap • Use of energies • Use of water • Use of chemicals • Emergency situation • Emission to air • Emission to water • Noise level • Soil pollution • Dust level • Recycling • Progress of program 						
Product <ul style="list-style-type: none"> • Regulatory requests • Significant aspects • Waste and scrap • Use of energies • Use of water • Use of chemicals • Emergency situation • Emission to air • Emission to water • Noise level • Soil pollution • Dust level • Recycling • Progress of program 						

Aspect	Monitoring Frequency	Procedure no.	Indicator	Limit	Results	Remarks
<p>Service</p> <ul style="list-style-type: none"> • Regulatory requests • Significant aspects • Waste and scrap • Use of energies • Use of water • Use of chemicals • Emergency situation • Emission to air • Emission to water • Noise level • Soil pollution • Dust level • Recycling • Progress of program 						

Reviewed by:

(EMS Coordinator)

Signature

Date

300.30-18

Evaluation of Compliance

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Evaluation of Compliance		SOP no.: EMS-4.5.2
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for evaluation of compliance documentation in accordance with clause 4.5.2 of ISO 14001:2004 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. The ISO 14001:2004 systems coordinator (environmental management system coordinator) is responsible for SOP compliance.

Procedure

Note: The departmental managers are responsible for the evaluation of compliance.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Evaluation of Compliance		SOP no.: EMS-4.5.2
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

1. The company has established, maintained, and implemented procedures for monthly evaluation of compliance with applicable legal requirements.
2. The organization keeps records of the results of the periodic evaluations.
3. The organization evaluates compliance with other requirements to which it subscribes. The organization shall keep records of the results of the periodic evaluations.

Documentation

1. Critical documentation index, refer to Attachment no. 4.5.2 (1)
2. Evaluation records

Reasons for Revision

mm/dd/yyyy (1) First time issued for (Your Company Name).

SOP no.: EMS-4.5.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5.2 (1)

Critical Documents Index

Key Procedures	Responsibility (Departmental Manager)
<ul style="list-style-type: none">• Environmental policy• Identifying environmental aspects• Setting environmental objectives• Description of the scope of the EMS• Environmental programs• Retention of training records• Internal and external communication• Processing instructions• Emergency control• Regulatory compliance• Monitoring• Nonconform investigation• Change control• Corrective action and preventive measures• Calibration• Environmental monitoring records• Auditing• Management review• Complaints• Interested parties	

Reviewed by:
(EMS Coordinator)

Signature

Date

300.30-19

Nonconformity, Corrective Action, and Preventive Action

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Nonconformity, Corrective Action, and Preventive Action		SOP no.: EMS-4.5.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for nonconformity, corrective action, and preventive action in accordance with clause 4.5.2 of ISO 14001:2004 standard and local regulatory requirements.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. The ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Nonconformity, Corrective Action, and Preventive Action		SOP no.: EMS-4.5.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Procedure

1. The findings, conclusions, and recommendations reached as a result of measuring, monitoring, audits, and other reviews of the environmental management system are documented, and the necessary corrective and preventive actions are identified. The management ensures that these corrective and preventive actions have been implemented and that there is a systematic follow-up to ensure their effectiveness.
2. The organization has established, implemented, and maintained procedure(s) for dealing with actual and potential nonconformity(ies) and for taking corrective action and preventive action. The procedure(s) define requirements for
 - a. Identifying and correcting nonconformity(ies) and taking action(s) to mitigate their environmental impacts
 - b. Investigating nonconformity(ies), determining their cause(s), and taking actions in order to avoid their recurrence
 - c. Evaluating the need for action(s) to prevent nonconformity(ies) and implementing appropriate actions designed to avoid their occurrence
 - d. Recording the results of corrective action(s) and preventive action(s) taken
 - e. Reviewing the effectiveness of corrective action(s) and preventive action(s) taken

Actions taken are appropriate to the magnitude of the problems and the environmental impacts encountered.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Nonconformity, Corrective Action, and Preventive Action		SOP no.: EMS-4.5.3
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

The organization ensures that any necessary changes made to the environmental management system are documented.

Documentation

1. Nonconformance and corrective action report, refer to Attachment no. 4.5.3 (1)

Reasons for Revision

mm/dd/yyyy (1) First time issued for (Your Company Name).

SOP no.: EMS-4.5.3

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5.3 (1)

Nonconformance and Corrective Action Report

To: _____

From: _____

Department: _____ Name: _____
Deviation: Sent to: _____ Date: _____
Corrective action: Date: _____ Name: _____
Follow-up: Date: _____ Name: _____

Reviewed by:
(EMS Coordinator)

_____ Signature

_____ Date

300.30-20

Control of Records

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Control of Records		SOP no.: EMS-4.5.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for control of records in accordance with clause 4.5.4 of ISO 14001:2004 standard and local regulatory requirements.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. The ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Control of Records		SOP no.: EMS-4.5.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Procedure

1. Records are evidences of the ongoing operation of the EMS and cover, for example, the need for records is required only where to demonstrate conformity with requirements of EMS and of the standard.
 - Legislative and regulatory requirements
 - Permits
 - Environmental aspects and their associated impacts
 - Environmental training activity
 - Inspection, calibration and maintenance activity
 - Monitoring data
 - Details of nonconformance: incidents, complaints, and follow-up action
 - Product identification composition and properly data
 - Supplier and contractor information
 - Environmental audits and management reviews
2. The management of documents includes means of identification, collection, indexing, filing, storage, protection, maintenance, retrieval, retention, and disposition of pertinent EMS documentation and records.
3. Following are the key elements of EMS records and information management:

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Control of Records		SOP no.: EMS-4.5.4
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

- a. What environmental information does the organization need to manage effectively
 - b. What capability does the organization have to identify and track key indicators of performance and other data necessary to achieve its objectives
 - c. How does the organizations record/information management system make information available to the employees who need it when they need it?
4. It is ensured that in the event of accident, the environmental records are retrievable. The copy of all records are kept by concerned responsible at a separate location.

Documentation

1. EMS record, refer to Attachment no. 4.5.4 (1)

Reasons for Revision

- mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.5.4

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5.4 (1)

EMS Record

Prepared by:

To: Concerned Responsible

Source	Records	Shelf-life	Responsibility	Location
Activity	Regulatory Legislation Permits Training Aspects/Impact Program Monitoring data Nonconformity(ies) Emergencies Manufacturing Customer Feedback EMS audit Management review			
Product	Regulatory Legislation Permits Training Aspects/Impact Program Monitoring data Nonconformity(ies) Emergencies Manufacturing Customer Feedback EMS audit Management review			

Source	Records	Shelf-life	Responsibility	Location
Services	Regulatory Legislation Permits Training Aspects/Impact Program Monitoring data Nonconformity(ies) Emergencies Manufacturing Customer Feedback EMS audit Management review			

Reviewed by:

(EMS Coordinator)

Signature

Date

300.30-21

Internal Audit

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Internal Audit		SOP no.: EMS-4.5.5
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for internal audit in accordance with clause 4.5.5 of ISO 14001:2004 standard and local regulatory requirements.

Responsibility

The responsibility of all departmental managers or supervisors is to understand and implement general requirements described in the procedure. The ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

Procedure

1. Audits of the EMS are conducted on a periodic basis (every three months) to determine whether the system conforms to planned arrangements and has been properly implemented and maintained.
2. Audits of the EMS are carried out by organization personnel, and/or by external parties selected by the organization. In any case, the person(s) conducting the audit is(are) in a position to do so objectively and impartially and should be properly trained.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Internal Audit		SOP no.: EMS-4.5.5
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

3. The frequency of audits is guided by the nature of the operation in terms of its environmental aspects and potential impacts. Also, the results of previous audits are considered in determining frequency.
4. The EMS audit report is submitted in accordance with the audit plan.
5. The audits are conducted to determine
 - a) Conformance to planned arrangements for environmental management including the requirements of this International Standard.
 - b) EMS has been properly implemented and is maintained.
 - c) Provide information on the results of audits to management.

Documentation

1. General audit check list, refer to Attachment no. 4.5.5 (1)
2. Revision form (SOPs), refer to Attachment no. 4.5.5 (2)
3. Audit checklists prepared based on the SOPs (prepare the list based on your own documents)
4. EMS system audit program, refer to Attachments no. 4.5.5 (3)
5. General audit checklist based on 2nd edition ISO 14001:2004 requirement to perform gap analysis 4.5.5 (4)

Reasons for Revision

mm/dd/yyyy 1. First time issued for (Your Company Name).

SOP no.: EMS-4.4.5
 Issue date: mm/dd/yyyy
 Revision no.: New

Attachment no. 4.4.5 (1)

Environmental Management System Audit Check List (General)

4.2 Policy	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Is there an environmental policy defining appropriateness; continual improvement, and public awareness on significant aspects affecting the environment.					
2. Is there a system for policy review based on <ul style="list-style-type: none"> • Documentation • Implementation • Maintenance, and • Communication 					
3. Is the policy statement signed off by the management responsible.					
4.3.1 Aspects/Impacts/Effects	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Environmental objectives are set on the basis of aspects/ impacts/effects analysis?					
2. Is there a procedure describing aspects/ impacts/ effects analysis?					
3. The aspects/ impacts/ effects analysis carried out is documented.					
4. Procedures used to identify environmental aspects/ impacts are maintained updated.					

continued

4.3.2 Legal and Other Requirements	Reference SOPs	Reference Documents	Reference Records	Remarks/Observations	Completion Date
1. Is there a procedure describing access to the legal and other requirements applicable to the environmental aspects of the company's <ul style="list-style-type: none"> • Activities • Products • Services 					
4.3.3 Objectives and Targets	Reference SOPs	Reference Documents	Reference Records	Remarks/Observations	Completion Date
1. Are the objectives and targets consistent with environmental policy?					
2. Are the objectives and targets consistent with commitment to prevention of pollution?					
3. The communication (both internal and external) regarding environmental policy is <ul style="list-style-type: none"> • Maintained • Documented 					
4.3.4 Environmental Management Program	Reference SOPs	Reference Documents	Reference Records	Remarks/Observations	Completion Date
1. Is there an established documented environmental program?					
2. Is there a manual stating environmental policy, objectives, and targets?					
3. Is the control and distribution of the environmental management program satisfactory?					
4. Are resources, responsibilities and designations stated in the environmental management program?					
5. Is there a time frame described in the environmental management program to achieve objectives and targets?					

4.4.2 Training Awareness, Competency, and Communication	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Is there a procedure identifying training needs applicable to the functions of significant impacts within the company?					
2. Are personnel adequately trained for the functions that they perform?					
3. Is there an in-house training program?					
4. Is there an external course attendance program?					
5. Are training needs effectively identified?					
6. Are records of training maintained for each employee?					
7. Are required levels of qualifications and experience defined for environmental activities?					
8. Are the internal and external communications regarding environmental policy maintained and documented?					
4.4.6 Operational Control	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Is there a procedure to identify and document the operations and procedures related to suppliers and contractors as they impact environmental policy?					
2. Is there a procedure to ensure that the contractors are aware of company's EMS requirement?					
3. Is there an established documented purchasing system?					
4. Are these procedures ensuring that purchased product conforms to the specified environmental standard?					
5. Is there a system for evaluation of suppliers and subcontractors?					

continued

6. Is there a documented procedure for the audit of suppliers and subcontractors?					
7. Is there an approved list of suppliers effecting the environmental policy?					
8. Are purchased materials listed by some class or grade?					
9. Is there a system to check purchased products against purchase order?					
10. Does order identify number and quality of material?					
11. Is there a procedure for verification of sub contractors products for environmental compliance?					
4.4.7 Emergency Preparedness and Response	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Do the work instructions/ procedure explain safety precautions during the specific activity?					
2. Are the employees trained to follow safety precautions at work?					
3. Are the emergency-handling procedures reviewed, revised, and updated?					
4. Are the emergency procedures tested (where practical) by simulation?					
5. Is there an emergency/ accident reporting system?					
6. Is there a procedure to identify aspects and impacts in case of emergency?					
7. Is the facility well equipped to manage crisis?					
8. Are the employees able to handle emergency situations?					

4.5.1 Monitoring and Measurement	Reference SOPs	Reference Documents	Reference Records	Remarks/Observations	Completion Date
1. Are there the procedures to identify the key operations impacting environment?					
2. Are the evaluation procedures described to ensure compliance with legislation and regulations?					
3. Are the evaluation records maintained?					
4.5.2 Nonconformance, Corrective, and Preventive Actions	Reference SOPs	Reference Documents	Reference Records	Remarks/Observations	Completion Date
1. Is there a procedure to define responsibility to handle nonconformance followed by corrective action and preventive measures?					
2. Does the system make provision for the identification and segregation of non conforming items pending disposition?					
3. Is there a procedure of raising non conformance reports and notifying relevant personnel customers in a timely manner?					
4. Is there a procedure for promptly implementing the agreed remedial action?					
5. Is a provision made for review and approval of documents applicable to rework on non conforming products?					
6. Does the system ensure retainment of records of corrective actions taken?					
7. Does the system allow notifications to legislative authorities?					
8. Is there a procedure to describe corrective actions and preventive measures?					

continued

4.5.2 Nonconformance, Corrective, and Preventive Actions	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
9. Does the system allow investigation and correction of noncompliance detected <ul style="list-style-type: none"> • Within the process • Product • Services • Within work operations/ Instructions • Customer complaints 					
10. Are CA Causes and resolutions recorded?					
11. Are findings on nonconformance prescribed for management review?					
4.5.4 EMS Audit	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Is there a procedure describing EMS audit <ul style="list-style-type: none"> • Frequency • Based on identified activities 					
2. Does the procedure ensure determining conformity, implementation, and maintenance of the EMS.					
3. Does the procedure indicate to inform the results to the management?					
4. Does the procedure describe the appropriate experience and qualification of the external auditors?					
4.6 Management Review	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Does the procedure exist and describe periodical review of EMS?					
2. Does the procedure ensure to determine effectiveness and adequacy of the EMS.					
3. Does the procedure ensure changes in the existing EMS based on the changes?					

SOP no.: EMS-4.4.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5.5 (2)

Revision Form

DEPARTMENT:		PROCEDURE NO.:	
FROM:		TO:	
TITLE:		CC:	
DATE:			
Internal	External Audit	Customer complaint	Supplier
<i>(1) Statement of the problem:</i>			
<i>(2) Root cause of the problem:</i>			
<i>(3) Solution:</i>			
<i>(4) Solution implementation of the action plan:</i>			
<i>(5) Monitor dates/actions required by others:</i>			
Date:		Signature:	

Please attach additional pages if necessary

SOP no.: EMS-4.4.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5.5 (3)

EMS System Audit Program

Copy to: Concerned Manager

Scope	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Departments	Auditor
General and policy	X													
Aspects, legal, program		X												
Structure, responsibility			X											
Communication				X										
Documentation, document control					X									
Operational control, emergencies						X								
Monitoring							X							
Corrective actions, records								X						
Audit, review									X					

Prepared by: _____
Signature Date

Reviewed by: _____
 (EMS Coordinator) Signature Date

SOP no.: EMS-4.4.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5.5 (4)

Checklist ISO 14001:2004

(November 2004)

Overall Documentation Requirements	Reference SOPs	Reference Document	Reference Record	Remarks/ Observations	Completion Date
Perform documentation review and ensure that the following documents are available as required specifically by the standard: (a) Documented information on environmental aspects and impacts evaluation (b) Records of identified applicable environmental legal requirements and document(s) showing applicability to its environmental aspects (c) Documented policy, objectives, and targets and programs (d) Documented roles, responsibilities and authorities (e) Records on competence and performed training of own employees and of relevant personnel working on its behalf, for example contractors. Records of emergency preparedness training and tests (if applicable) (f) Documented communications from and with external interested parties, at least complaint records (g) Documented procedures for operations and activities that may cause significant environmental impacts					

continued

<p>(h) Documenting of information to monitor performance, applicable operational controls, and conformity with objectives and targets. Records to track calibration and maintenance of monitoring and measurement equipment</p> <p>(i) Documented changes resulting from corrective and preventive action (including incident reports)</p> <p>(j) Documenting evaluation of compliance with environmental legal requirements and other applicable environmental requirements to which your organization subscribes</p> <p>(k) Documented internal audit programs and records from audits</p> <p>(l) Records from management review</p>					
Changes (referred to clause in standard):					
Overall Documentation Requirements	Reference SOPs	Reference Document	Reference Record	Remarks/ Observations	Completion Date
<p>3. Definitions Seven new terms are included, primarily for harmonization and compatibility with ISO 9001:2000 (these are audit, document, procedure, record, nonconformity corrective action, and preventive action).</p>					
<p>4.1 General Requirements More explicit on</p> <ol style="list-style-type: none"> The need to demonstrate continual improvement of the EMS. The need for the organizations to clearly define the scope of the EMS. 					
<p>4.2 Environmental Policy More explicit regarding communication of policy to persons working on its behalf, not only to employees as in 1996 edition. (Communication to "external" persons need also be seen in conjunction with requirements in clauses 4.4.2 and 4.4.6c)</p>					

<p>4.3.1 Environmental Aspects More explicit on</p> <ol style="list-style-type: none"> 1. Inclusion of planned or new developments and new or modified activities, products, and services within the aspects process (this was formerly under clause 4.3.4). 2. Clear requirement for the information from the aspect process to be documented. 3. Significant aspects shall be considered when establishing and maintaining/developing the EMS in general and as a basis to set the environmental objectives. 					
<p>4.3.2 Legal and Other Requirements More explicit on</p> <ol style="list-style-type: none"> 1. Determining the applicability of legal/other requirements to an organization's environmental aspects. 2. Ensuring that environmental, legal, and other environmental requirements to which the organization subscribes are considered in developing, implementing, and maintaining the EMS. 					
<p>4.3.3 Objectives, Targets, and Program(s) Changes are</p> <ol style="list-style-type: none"> 1. More explicit to address that objectives and targets shall be consistent with commitment to continual improvement (also for environmental performance). 2. Text under former clause 4.3.4 on programs has been merged into this clause. 					
<p>4.4.2 Competence, Training, and Awareness The new version is more explicit, requiring procedure for awareness "training" also for relevant persons working on behalf of the organization, which could include contractors, temporary staff, etc., and not only own employees or members as specified in the 1996 version. (Communication of environmental policy (ref. 4.2) to</p>					

continued

<p>“external” persons can, as stated in Annex A2 in the standard, be in alternative forms to the policy statement itself, such as rules, directives, and procedures covering pertinent sections of the policy)</p>					
<p>4.4.3 Communication The new version states that the organization shall establish (a) method(s) for external communication about its significant aspects if it is decided to communicate</p>					
<p>4.4.4 Documentation The new version is more detailed in defining the documentation needed to be included in an EMS. The scope of the EMS shall be described in the system documentation</p>					
<p>4.4.5 Control of Documents Changes are 1. Closer alignment to ISO 9001:2000 in terms of content and clausal structure 2. More explicit requirement to control documents of external origin 3. The term “document” is now clearly defined and is the same as for ISO 9001:2000</p>					
<p>4.5.1 Monitoring and Measurements The new version no longer requires a “documented procedure,” but note that the clause requires procedure(s) that includes the documenting of information required to monitor performance, applicable operational controls, and conformity with objectives and targets.</p>					
<p>4.5.2 Evaluation of Compliance New clause partly covered by 4.5.1 in 1996-edition. Requires evaluation of compliance for both legal environmental requirements and other requirements to which an organization subscribes. There is no requirement for a documented procedure, but it is required to keep records of the evaluation(s)</p>					

<p>The changes made imply that this issue has been given more emphasis</p>					
<p>4.5.3 Nonconformity, Corrective Action, and Preventive Action This clause has been reworded for clarity. A new version more clearly requires</p> <ul style="list-style-type: none"> • Investigation and determination of causes related to actual non conformities to avoid their recurrence, • Procedure for evaluating need for action(s) to prevent occurrence of potential nonconformities, • Records of the results of corrective and/or preventive actions taken, and • Review of the effectiveness of the actions taken. 					
<p>4.5.4 Control of Records The new version also makes a more general requirement for the establishment and maintenance of any records required “to demonstrate conformity to the requirements of its EMS and of this International Standard”.</p>					
<p>4.5.5 Internal Audit This clause has been reworded for clarity, but also note that Annex A refers to the standard ISO 19011:2002 for guidance.</p>					
<p>4.6 Management Review The new version has been harmonized with ISO 9001:2000, with a more detailed list of agenda/content for management review. The input to the management review shall include</p> <ol style="list-style-type: none"> a) Results of internal audits and evaluations of compliance with legal requirements and with other requirements to which the organization subscribes; b) Communication(s) from external interested parties, including complaints; c) The environmental performance of the organization; 					

continued

d) The extent to which objectives and targets have been met; e) Status of corrective and preventive actions; f) Follow-up actions from previous management reviews; g) Changing circumstances including developments in legal and other requirements related to its environmental aspects; and h) Recommendations for improvement.					
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300.30-22

Management Review

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Management Review		SOP no.: EMS-4.6
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Purpose

To describe the procedure for management review in accordance with clause 4.6 of ISO 14001 standard.

Responsibility

This is the responsibility of all departmental managers or supervisors to understand and implement general requirements described in the procedure. The ISO 14001:2004 systems coordinator (environmental management system controller) is responsible for SOP compliance.

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Management Review		SOP no.: EMS-4.6
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

Procedure

1. A continual improvement process is applied to an environmental management system to achieve overall improvement in environmental performance.
2. The organizations management at appropriate intervals (6 months) conducts a review of the EMS to ensure its continuing suitability and effectiveness.
3. The review of the EMS is broad enough in scope to address the environmental dimensions of all activities, products, or services of the organization, including their impact on financial performance and possibly competitive position.
4. The review of the EMS includes, but not limited to,
 - a) Results of internal audits and evaluations of compliance legal requirements and with other requirements to which the organization subscribes
 - b) Communication(s) from external interested parties, including complaints
 - c) The environmental performance of the organization
 - d) The extent to which objectives and targets have been met
 - e) Status of corrective and preventive actions
 - f) Follow-up actions from previous management reviews
 - g) Changing circumstances, including developments in legal and other requirements related to its environmental aspects
 - h) Recommendations for improvement

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Management Review		SOP no.: EMS-4.6
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

5. The outputs from management review includes any decisions and actions related to possible changes to environmental policy, objectives, targets, and other elements of the environmental management system, consistent with the commitment to continual improvement.
6. Key documents considered in the review of EMS
 - a. Periodical review of EMS
 - b. Appropriate involvement of employees in the review of the EMS and follow-up
 - c. Incorporation of interested parties views into the EMS review
7. The concept of continual improvement is embodied in the EMS. It is achieved by continually evaluating the environmental performance of the EMS against its environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.
8. The continual improvement process is extended to
 - Identify areas of opportunity for improvement of the environmental management system, which lead to improved environmental performance
 - Determine the root cause or causes of nonconformances or deficiencies
 - Develop and implement (a) plan(s) of corrective and preventive action to address root cause(s)
 - Verify the effectiveness of the corrective and preventive actions
 - Document any changes in procedures resulting from process improvement
 - Make comparisons with objectives and targets

**STANDARD OPERATING PROCEDURE
YOUR COMPANY NAME HERE**

SUBJECT: Management Review		SOP no.: EMS-4.6
Distributed to:	Based on: EN ISO 14001:2004	Revision no.: New
Written by:	Checked by:	Approved by:
Date supersedes: mm/dd/yyyy	Date issued: mm/dd/yyyy	Page: XXX

9. Key elements considered in corrective and preventive action and continual improvement are the following:

- a. Identification of the process for corrective and preventive action and improvement
- b. Verification by the organization that corrective and preventive actions and improvements are effective and timely

Documentation

1. Management review minutes, refer to Attachment no. 4.6 (1)

Reasons for Revision

mm/dd/yyyy (1) First time issued for (Your Company Name)

SOP no.: EMS-4.6

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.6 (1)

Management Review Form

PARTICIPANTS: _____

DATE: _____

A. Inputs to the review could include the following:

- Audit summaries
- Changes in viewpoints and opinions of interested parties
- Results of any performance improvement projects
- Monitoring summaries showing compliance results
- Summary of communications regarding performance
- Summary of reports to regulators
- Proposals for new or changed objectives

B. The review should aim to answer these questions:

- Is the EMS satisfactory? If not, what needs to be done?
- Is it meeting company needs?
- Do we meet our objectives? If not, why not?
- Did we achieve regulatory compliance? If not, why not?
- What changes do we need to make?
- Do our objectives need to be broader? Narrower? More ambitious? Less ambitious?
- What should our objectives be for the coming period?
- Have there been any regulatory or other changes that need to be considered?
- Is our policy still appropriate?
- Others.

Remarks by: _____

Reviewed by:

(EMS Coordinator)

Signature

Date

300.40-1

Examples of Environmental Policy Statements

This section is exclusively written to provide examples of EMS programs which can be directly applied by any process-related industry or by an organization for the successful implementation and development of environmental management systems and programs. The examples include policy statement, objective, targets, and the actions required. The examples quoted can be modified according to the individual company's requirements.

The management has defined the organization environmental policy and has ensured that it includes a commitment to continuous improvement and prevention of pollution is appropriate to the nature, scale, and environmental impacts of its activities, products, or services. Includes a commitment to comply with relevant environmental legislation and regulations, and with other requirements to which the organization is associated, which provides the framework for setting and reviewing environmental objectives and targets.

The Environmental Management System (EMS) is documented, implemented, maintained, and communicated to all employees and is available to the public for information.

The environmental policy recognizes all activities, products, or services causing impacts on the environment. The (Your Company Name) is committed to:

Environmental Policy

The Environmental Management System (EMS) is documented, implemented, maintained, and communicated to all employees and is available to the public for information.

The environmental policy recognizes all activities, products, or services causing impacts on the environment.

1. Minimize any significant adverse environmental impact of new developments through the use of the integrated environmental management procedures and planning.

2. Development of environmental performance evaluation procedures and associated indicators.
3. Embody life cycle thinking.
4. Design products in such a way to minimize their environmental impacts in production, use, and disposal.
5. Sharing environmental experience.
6. Work toward sustainable development.
7. Encourage the use of EMS by suppliers and contractors.
8. Comply with and follow up on the requirements of relevant laws and standards for environmental protection.
9. Choose raw materials, materials and processes with small negative environmental impact, to economize with resources and to decrease emissions and waste amounts.
10. Perform environmental assessments when a process is changed.
11. Have an open dialogue on environmental issues with our staff, customers, suppliers, and other stakeholders.
12. Follow up on and set new targets for our environmental work on a regular basis to ensure a continuous decrease in environmental impacts.
13. Will develop manufacturing processes with minimum environmental impact, particularly the production.
14. Will educate, train, and motivate our employees to carry out their tasks in an environmentally responsible manner.
15. Will periodically conduct environmental audits in order to continually improve our environmental performance.
16. Will establish environmental management system to keep us informed about the impact of all our operations, allowing us to achieve the most effective and cost-efficient improvements in performance.
17. We are committed to publishing targets for continual improvement in performance, and will work toward these with annual action plans.
18. Will reduce the impact of our transport operations by maximizing the efficiency of our routes and vehicles, reviewing our selection of fuels and vehicles, and thinking flexible about delivery methods.
19. Will consider the environmental impacts of our suppliers, alongside quality and cost. We will set environmental standards for our suppliers, and work with them to achieve these standards.

20. Will reduce the amount of waste resulted from our operations. We will minimize use of materials, design, and modify operations to minimize waste production, use materials longer where practicable.
21. Conserve natural resources of water where technically and practically possible.
22. Will reduce the amount of waste and will always investigate recycling opportunities for used materials.
23. Will seek to reduce the consumption of ozone-depleting substances (ODSs) where possible.
24. Will adopt means and ways to manage the disposal of hazardous substances and minimize their consumption where possible.
25. Will seek to reduce electrical consumption and improve energy efficiency where possible.

The legal responsibility for the environmental impact of the operations lies with the managing director, directors, each departmental manager, and staff are responsible with his/her scope of operation for the implementation of the environmental system.

Approved by: _____
Managing Director

300.50-1

Examples of Objectives, Targets, and EMS Programs

Policy no. 1A

Environmental Management System Program

POLICY No. 1A	:	Minimize any significant adverse environmental impact of new developments through the use of integrated environmental management procedures and planning
OBJECTIVE	:	Review, develop, and implement ISO 14001:2004 Environmental Management System
TARGET	:	Achieve certification by December 2000
PROGRAM	:	Pollution prevention and continuous improvement

Actions

Recommendation

- Seek approval from the Managing Director to initiate the work on ISO 14001:2004 EMS.
- Identify key persons.
- Identify Environmental Management System (EMS) coordinator.
- Resource workshop on ISO 14001:2004.
- Conduct staff training on elements of ISO 14001:2004 standard and implementation.
- Follow Management Review/Review Local Legislation.
- Identify aspects of significant impacts on environment.
- Refer enclosed schedule.
- Achieve Certification.

Responsibility: _____

Signature/Date: _____

Policy no. 2A

Environmental Management System Program

POLICY No. 2A	:	Development of environmental performance evaluation procedures and associated indicators
OBJECTIVE	:	Establish the aspects of immediate and significant environmental concern and establish procedures for monitoring
TARGET	:	Write system procedures and implement them by July 2000
PROGRAM	:	The Environmental Management System Documentation Development

Actions

- Write Environmental Management System (EMS) manual.
- Write procedures based on ISO 14001 standard.
- Identify environmental performance indicator to monitor the progress.

Responsibility: _____

Signature/Date: _____

Policy no. 3A

Environmental Management System Program

POLICY No. 3A : Embody life cycle thinking
OBJECTIVE : Achieve recycling approach 100% of the present level by year 2004
TARGET : Optimize use of recycle products
 25% in year 2001
 25% in year 2002
 25% in year 2003
 25% in year 2004
PROGRAM : Recycling

Action

- Rubbish collected for recycling can be taken to a municipality recycling center. Cardboard, paper, plastic bags/bottles/cups, glass, and aluminum cans can be recycled.

Responsibility: _____

Signature/Date: _____

Policy no. 4A

Environmental Management System Program

POLICY No. 4A	:	Design products in such a way to minimize their environmental impacts in production, use, and disposal
OBJECTIVE	:	Pollution prevention where possible
TARGET	:	Continuous basis effective July 2000 and onwards
PROGRAM	:	New Product Development and Associated Activities

Actions

- Ensure materials segregation.
- Provide instruction for materials and equipment handling.
- Use closed equipment for processing.
- Provide adequate extraction (ventilation) system in rooms.
- Provide staff adequate protective clothing.
- Develop cleaning procedure.
- Maintain calibration program.
- Introduce cleaning in place system in production.
- Maintain pressure inside the rooms as per procedures.
- Regulate waste disposal as per company's procedures.
- Resource material safety data sheets.
- Training staff on environmental awareness.
- Conduct emergency handling workshops.

Responsibility: _____

Signature/Date: _____

Policy no. 5A

Environmental Management System Program

POLICY No. 5A	:	Sharing environmental experience
OBJECTIVE	:	To induce pollution prevention, learn best technology available, practical commercially feasible
TARGET	:	Effective July 2000 on continuous basis. Embody life cycle thinking in new projects. Share experience at least once in a year from the year 2001
PROGRAM	:	Continuing Education

Actions

- Attend IRCA or EARA registered courses.
- Join professional organizations.
- Subscribe to journals or obtain information through Internet.
- Publish articles in journals.
- Communicate to interested parties.
- Give presentations in conferences and forums.

Responsibility: _____

Signature/Date: _____

Policy no. 6A

Environmental Management System Program

POLICY No. 6A : Work toward sustainable development
OBJECTIVE : Pollution Prevention and Counts Improvement
TARGET : Effective July 2000
PROGRAM : Life Cycle Thinking

Actions

- Educate and train employees.
- Communicate with interested parties.
- Adopt best technology available to prevent pollution where possible.
- Review product life cycle.

Responsibility: _____

Signature/Date: _____

Policy no. 7A

Environmental Management System Program

POLICY No. 7A	:	Encourage the use of EMS by suppliers and contractors
OBJECTIVE	:	To induce and optimize environmental compliance and pollution prevention globally among our suppliers
TARGET	:	Prevent Environmental pollution 10% in year 2000 (vendors) 20% in year 2001 (vendors) 30% in year 2002 (vendors) 40% in year 2003 (vendors)
PROGRAM	:	Suppliers Awareness Program

Actions

Recommendations

- Create a company environmental policy and request suppliers/contractors and others to comply with the requirements of this policy.
- Create a questionnaire for the supplier to motivate environmental compliance thinking.

Responsibility: _____

Signature/Date: _____

Policy no. 7B

Environmental Management System Program

POLICY No. 7B	:	Encourage the use of EMS by suppliers and contractors
OBJECTIVE	:	To induce and optimize environmental compliance and pollution prevention globally among our suppliers
TARGET	:	Prevent Environmental pollution 10% in year 2000 (vendors) 20% in year 2001 (vendors) 30% in year 2002 (vendors) 40% in year 2003 (vendors)
PROGRAM	:	Suppliers Awareness Program

Action

Follow-up with suppliers to provide material safety data sheet for each material considered to be significant environmental impact.

Responsibility: _____

Signature/Date: _____

Policy no. 8A

Environmental Management System Program

POLICY No. 8A	:	Comply with and follow-up on the requirements of relevant laws and standards for environmental protection
OBJECTIVE	:	To be in compliance with local environmental legislation
TARGET	:	Develop and implement the program effective July 2000 and work on continuous basis. Achieve compliance to local legislation by year 2005
PROGRAM	:	Legislation Compliance

Actions

- Obtain local legislation applicable, if any.
- Obtain legislation applicable in other states.
- Develop standard for the company.

Responsibility: _____

Signature/Date: _____

Policy no. 9A

Environmental Management System Program

POLICY No. 9A	:	Choose raw materials, materials and processes with small negative environmental impact, to economize with resources and to decrease emissions and waste amount
OBJECTIVE	:	To prevent the environmental pollution by managing our processes associated activities and services
TARGET	:	Evaluate the process, activities, and services associated risk by year 2001 and initiate corrective action by year 2003
PROGRAM	:	Products/Activities and Services Optimization

Actions

- Review process flow for each dosage form and evaluate the risks involved.
- Initiate corrective actions both short term and long term wherever necessary.

Responsibility: _____

Signature/Date: _____

Policy no. 9B

Environmental Management System Program

POLICY No. 9B : Choose raw materials, materials and processes with small negative environmental impact, to economize with resources and to decrease emissions and waste amounts

OBJECTIVE : Pollution Prevention

TARGET : Effective July 2000 and on continuous basis

PROGRAM : Induce Life Cycle Thinking

Action

- Resource materials from the environmental-friendly sources where possible.

Responsibility: _____

Signature/Date: _____

Policy no. 10A

Environmental Management System Program

POLICY No. 10A	:	Perform environmental assessments when a process is changed
OBJECTIVE	:	Pollution Prevention
TARGET	:	Effective July 2000, the projects commencing from year 2001 shall be reviewed for environmental compliance
PROGRAM	:	Continuous Improvement

Actions

- Review if the process changes are made with a particulate reference to the environment.
- Review processes introduced for the first time.
- Make necessary change in process change SOP.

Responsibility: _____

Signature/Date: _____

Policy no. 11A

Environmental Management System Program

POLICY No. 11A	:	Have an open dialogue on environmental issues with our staff, customers, suppliers, and other stockholders
OBJECTIVE	:	Encourage use of EMS
TARGET	:	Publish at least one report per year, effective year 2001
PROGRAM	:	Pollution Prevention

Action

- Publish environmental trend reports for information.

Responsibility: _____

Signature/Date: _____

Policy no. 12A

Environmental Management System Program

POLICY No. 12A	:	Follow-up on and set new targets for our environmental work on a regular basis to ensure a continuous decrease in environmental impacts
OBJECTIVE	:	To continuously reduce the amount of waste resulted from our operations
TARGET	:	Reduce waste generation 25% in year 2001 (Maintenance) 25% in year 2003 (Maintenance) 50% in year 2003 (Wash Rooms)
PROGRAM	:	Miscellaneous Waste Management

Action

Recommendation

- Environmental-friendly batteries that do not contain heavy metals such as mercury, cadmium, or lead (which cause air pollution when burned in a refuse incinerator) are widely available.

Responsibility: _____

Signature/Date: _____

Policy no. 12B

Environmental Management System Program

POLICY No. 12B	:	Follow-up on and set new targets for our environmental work on a regular basis to ensure a continuous decrease in environmental impacts
OBJECTIVE	:	Work toward sustainable development
TARGET	:	Conduct four Management Reviews per year
PROGRAM	:	Life Cycle Thinking

Action

- Conduct management review on a quarterly basis.

Responsibility: _____

Signature/Date: _____

Policy no. 13A

Environmental Management System Program

POLICY No. 13A	:	Will develop manufacturing processes with minimum environmental impact, particularly the production
OBJECTIVE	:	Prevent environmental pollution through process optimization
TARGET	:	All processes review for environmental compliance
		10%—2001
		20%—2002
		30%—2003
		50%—2004
		75%—2005
		100%—2006
		All new processes to be reviewed effective from October 2000
PROGRAM	:	Process Review

Actions

- Prepare a checklist to avoid or minimize the environmental pollution through manufacturing processes.
- Review all processes.
- Review new processes before implementation.

Responsibility: _____

Signature/Date: _____

Policy no. 14A

Environmental Management System Program

POLICY No. 14A	:	Company will educate, train, and motivate its employees to carry out their tasks in an environmentally responsible manner
OBJECTIVE	:	To economize with resource and to decrease emissions and waste amounts
TARGET	:	Do not purchase new files, but relabel old files 25% in year 2001 50% in year 2002 100% in year 2003
PROGRAM	:	Stationery and Office Supplies Optimization

Actions

Environmental issues for paper are numerous and include:

- Loss of natural habitats to environmentally damaging intensive tree farming
- Pollution during manufacture (e.g., bleaching agents, effluent, optical brightening agents (OBA), etc.)
- Energy usage
- Waste disposal: landfill and incineration

Recommendations

- Most stationery retailers stock a range of products labeled “environmentally friendly.” However, it is important to establish the criteria for this label, as some supplier’s labeling systems are misleading. If purchasing “environmentally friendly” items, company should obtain accurate, detailed information.

Responsibility: _____

Signature/Date: _____

Policy no. 14B

Environmental Management System Program

POLICY No. 14B	:	Company will educate, train, and motivate its employees to carry out their tasks in an environmentally responsible manner
OBJECTIVE	:	To economize with resource and to decrease emissions and waste amounts
TARGET	:	Do not purchase new files, made from nonrecycled materials 100% in year 2002
PROGRAM	:	Stationery and Office Supplies Optimization

Action

- Most stationery companies will source specific products on your behalf if they do not already stock them.

Responsibility: _____

Signature/Date: _____

Policy no. 14C

Environmental Management System Program

POLICY No. 14C	:	Company will educate, train, and motivate its employees to carry out their tasks in an environmentally responsible manner
OBJECTIVE	:	To economize with resource and to decrease emissions and waste amounts
TARGET	:	Purchase stationery from environmental-friendly source 50% in year 2001 50% in year 2002
PROGRAM	:	Stationery and Office Supplies Optimization

Action

- Use specialist suppliers where possible.

Responsibility: _____

Signature/Date: _____

Policy no. 14D

Environmental Management System Program

POLICY No. 14D	:	Company will educate, train, and motivate its employees to carry out their tasks in an environmentally responsible manner
OBJECTIVE	:	To economize with resource and to decrease emissions and waste amounts
TARGET	:	Induce computer-based communication technical and nontechnical 50% in year 2002 (Technical) 50% in year 2003 (Nontechnical)
PROGRAM	:	Stationery and Office Supplies Optimization

Action

- An IT-based requisition procedure could be used to save time and paperwork. Links with stationery suppliers are becoming increasingly sophisticated with technological developments and there are a number of systems used [electronic data interchange (EDI), for example]. Organizations could have a direct computer link with the supplier. Suppliers can also give you detailed printouts for improved control.

Responsibility: _____

Signature/Date: _____

Policy no. 14E

Environmental Management System Program

POLICY No. 14E	:	Company will educate, train, and motivate its employees to carry out their tasks in an environmentally responsible manner
OBJECTIVE	:	To economize with resource and to decrease emissions and waste amounts
TARGET	:	Purchase recycled secondary packaging materials 100% in year 2004
PROGRAM	:	Secondary packaging material optimization 10% in year 2001 20% in year 2002 20% in year 2003 20% in year 2004 30% in year 2004

Action

- Filing products made from recycled products and board include: ring binders, dividers, lever arch files, suspension files, box files, record cards, folders, memo pads, post-its, and shorthand pads.

Responsibility: _____

Signature/Date: _____

Policy no. 14F

Environmental Management System Program

POLICY No. 14F	:	Company will educate, train, and motivate our employees to carry out their tasks in an environmentally responsible manner
OBJECTIVE	:	To maintain a beautiful environment within the company premises and the surrounding without detrimental effects on the environment
TARGET	:	Introduce housekeeping inspection effective July 2000. Two audits per year
PROGRAM	:	Housekeeping Program

Action

- A beautiful environment is not an essential part of organizational activities. Water (and chemical) use should be monitored, and ultimately reduced without any detrimental effects on the attractiveness of the company's environment.

Recommendations

- If not already doing so, consider the use of recycled waste water for watering trees and plants around the grounds (see the above section on the reuse of waste water for further details).
- The use of chemical fertilizers should be monitored. Leaching of nitrates and phosphates into ground water systems or even directly into surface water bodies should be avoided as pollutants are liable to spread gradually through it.
- Protection of the groundwater is of critical importance for three reasons:
 - If it becomes polluted, it is very difficult to rehabilitate.
 - Aquifers (unconfined, confined, or perched) act as natural low-cost storage systems for large volumes of potable water which require relatively little treatment before use.
 - Groundwater provides the base flow of many surface water systems that may be of amenity value.

- The use of chemicals over an extended period of time will gradually reduce the fertility of the ground and therefore its ability to survive without external interference. Less/nonharmful (nonchemical) fertilizers could be used as a substitute that would not impact on the integrity of the ground, the water systems, or the diversity of flora and fauna.
- Consider producing your own compost from vegetable wastes/ grass clipping, and so on. To be used on plants and flower beds instead of buying fertilizers.
- Avoid wherever possible the use of pesticides (especially the act of “insurance spraying”). A small number of fat-soluble persistent pesticides (e.g., DDT, and aldrin and dieldrin) are broken down so slowly that they have time to spread and affect populations of nontarget species outside the areas of application and can cause immense damage along the animal/bird food chain.
- It is often better to choose native plants and flowers that are able to withstand hot conditions and possible drought.

Responsibility: _____

Signature/Date: _____

Policy no. 14G

Environmental Management System Program

POLICY No. 14G	:	Company will educate, train, and motivate our employees to carry out their tasks in an environmentally responsible manner
OBJECTIVE	:	Pollution Prevention
TARGET	:	Effective July 2001, at least one training session per year
PROGRAM	:	Environmental Awareness

Actions

- Arrange workshop.
- Distribute articles for reading.
- Conduct lectures.
- Distribute reading material.
- Use sign boards.
- Display slogans on the notice boards.
- Introduce motivational award.

Responsibility: _____

Signature/Date: _____

Policy no. 15A

Environmental Management System Program

POLICY No. 15A	:	Company will periodically conduct environmental audits in order to continually improve our environmental performance
OBJECTIVE	:	Pollution prevention and initiate corrective actions where applicable
TARGET	:	Conduct at least one audit per year effective 2001
PROGRAM	:	Continuous Improvement

Actions

- Write auditing procedure.
- Define frequency.
- Conduct audit.
- Initiate corrective program.

Responsibility: _____

Signature/Date: _____

Policy no. 16A

Environmental Management System Program

POLICY No. 16A	:	We will establish environmental management system to keep us informed about the impact of all our operations, allowing us to achieve the most effective and cost-efficient improvements in performance
OBJECTIVE	:	Efficient improvements in performance
TARGET	:	Effective July 2001, at least two reports per year
PROGRAM	:	Cost efficiency

Actions

- Establish environmental indicators based on cost.
- Monitor the impact as cost.
- Report to the higher management the benefits.

Responsibility: _____

Signature/Date: _____

Policy no. 17A

Environmental Management System Program

POLICY No. 17A	:	Company is committed to publishing targets for continuous improvement in performance, and will work toward these with annual action plans
OBJECTIVE	:	Pollution Prevention
TARGET	:	Effective year 2001, publish at least two reports indicating targets to be achieved
PROGRAM	:	Continuous Improvement

Actions

- Refer to management review.
- Refer to agreement and impacts.
- Define targets.
- Establish program.
- Assign responsibility.
- Publish reports on targets twice a year.

Responsibility: _____

Signature/Date: _____

Policy no. 18A

Environmental Management System Program

POLICY No. 18A	:	Company will reduce the impact of its transport operations by maximizing the efficiency of routes and vehicles, selection of fuels and vehicles, and thinking flexible about delivery methods
OBJECTIVE	:	Reduce consumption of fuel due to transportation by 50% by year 2002, using 1999 standard
TARGET	:	Reduce consumption of fuel 25% in year 2001 (Staff transportation) 25% in year 2002 (Heavy duty trailer)
PROGRAM	:	Transport (if appropriate) management

Actions

What needs to be considered when selecting vehicles for the company fleet?

- Fuel efficiency of the vehicle
- Purchase cost of the vehicle
- Cost and type of fuel
- Maintenance requirements
- Range between tank refills
- Likely distances of trips to be travelled by the vehicle
- Overall performance
- Environmental/public health considerations
- Automatic transmission vs. manual transmission (a vehicle with automatic transmission uses up to 10% more fuel than a similar model with manual transmission)

Responsibility: _____

Signature/Date: _____

Policy no. 18B

Environmental Management System Program

POLICY No. 18B	:	Company will reduce the impact of its transport operations by maximizing the efficiency of routes and vehicles, selection of fuels and vehicles, and thinking flexible about delivery methods
OBJECTIVE	:	Reduce emission of lead due to transportation by 50% of the present level by year 2003, using 1999 standard
TARGET	:	Reduce emission of lead 25% in year 2002 (Staff transportation) 25% in year 2003 (Heavy duty trailer)
PROGRAM	:	Transport (if appropriate) management

Action

- The use of lead-free petrol is encouraging as it is significantly less harmful to our health and also the health of the environment. Virtually all vehicles produced over the past ten years are designed specifically to use unleaded fuel, without the need of a catalytic converter.

Responsibility: _____

Signature/Date: _____

Policy no. 18C

Environmental Management System Program

POLICY No. 18C	:	Company will reduce the impact of its transport operations by maximizing the efficiency of routes and vehicles, selection of fuels and vehicles, and thinking flexible about delivery methods
OBJECTIVE	:	Reduce emission of particulates due to transportation by 5% of the present level by year 2003, using 1999 standard
TARGET	:	Reduce emission of particulates 2% in year 2002 (Staff transportation) 3% in year 2003 (Heavy duty trailer)
PROGRAM	:	Transport (if appropriate) management

Action

- Vehicles using diesel emit more particulate (smoke) emissions and nitrogen oxides than petrol-run cars that have catalytic converters, but ultra-low sulfur diesel that reduces smoke emission is available.

Responsibility: _____

Signature/Date: _____

Policy no. 18D

Environmental Management System Program

POLICY No. 18D	:	Company will reduce the impact of its transport operations by maximizing the efficiency of routes and vehicles, selection of fuels and vehicles, and thinking flexible about delivery methods
OBJECTIVE	:	Reduce emission and nitrogen oxides due to transportation by 100% of the present level by year 2002, using 1999 standard
TARGET	:	Reduce emission of lead 100% in year 2001 (Staff transportation) 100% in year 2002 (Heavy duty trailer)
PROGRAM	:	Transport (if appropriate) Management

Actions

- Servicing.
- Making sure company vehicles are regularly tuned and serviced (90% of inefficient vehicles can be re-tuned in just 15 min) can save money and reduce exhaust emissions.
- Daily service: quick visual check of body, tyres (a 2 psi drop in tyre pressure increases fuel consumption by 3%, and tyres under-inflated by 7 psi waste half a gallon of fuel per tank), lights, wind-screens, and mirrors.
- Weekly service: check brakes, screen-wash levels, oil and water under the bonnet.
- Monthly service: physical check of tyre pressure (over-inflated tyres have a shorter life and can be dangerous), full check of all under-bonnet levels, check for exhaust leaks, check that steering is "true" (i.e., not pulling to one side), check for service requirement against time and/or mileage.
- Keeping company vehicles serviced can account for up to 18% of total fuel saving, and will reduce the possibility of unexpected breakdowns.

Responsibility: _____

Signature/Date: _____

Policy no. 18E

Environmental Management System Program

POLICY No. 18E	:	Company will reduce the impact of its transport operations by maximizing the efficiency of routes and vehicles, selection of fuels and vehicles, and flexible thinking of delivery methods
OBJECTIVE	:	Reduce consumption of fuel due to transportation by 15% of the present level by year 2002, using 1999 standard
TARGET	:	Reduce consumption of fuel 5% in year 2001 (Staff transportation) 10% in year 2002 (Heavy duty trailer)
PROGRAM	:	Transport (if appropriate) management

Actions

- Training and driving style.
- Driving training can account for up to 11% of total fuel saving. Train all drivers in economical driving techniques, including:
 - Drive smoothly, avoiding harsh acceleration and heavy braking.
 - Use the gearbox efficiently to maintain revolutions in the mid-range (1500–2500 r.p.m.).
 - Research in The Netherlands by Novem (Netherlands Agency for Energy and the Environment 1996) has found that correct use of gears can reduce nitrogen oxide emissions by over 20% while reducing fuel consumption by an average of 15%.
 - Avoid “pumping” the accelerator or reviving the engine unnecessarily—this wastes fuel.
 - Plan all trips in advance.
 - Use of air-conditioning can increase fuel consumption by around 15%—do you use it unnecessarily?
 - Use of roof racks, open windows/ sunroofs, and others increases aerodynamic drag and so contributes to increased fuel use. Remove unnecessary roof racks.

Responsibility: _____

Signature/Date: _____

Policy no. 18F

Environmental Management System Program

POLICY No. 18F	:	Company will reduce the impact of our transport operations by maximizing the efficiency of routes and vehicles, selection of fuels and vehicles, and thinking flexible about delivery methods
OBJECTIVE	:	Optimize emission of lead and nitrogen oxides due to transportation by 50%
TARGET	:	Reduce emission of lead and nitrogen oxides 25% in year 2001 (Staff transportation) 25% in year 2002 (Heavy duty trailer)
PROGRAM	:	Transport (if appropriate) management

Actions

- Vehicle use.
- Reduce the need to travel (telesales, telecommunications, etc.).
- Plan and schedule journeys appropriately.
- Maintain the vehicle in good condition.

Responsibility: _____

Signature/Date: _____

Policy no. 19A

Environmental Management System Program

POLICY No. 19A	:	Will consider the environmental impacts of our suppliers, alongside quality and cost. We will set environmental standards for our suppliers, and work with them to achieve these standards.
OBJECTIVE	:	Pollution Prevention
TARGET	:	Develop questionnaire for suppliers by 2001 and send information to the supplier in phases 25% in year 2001 50% in year 2002 75% in year 2003 100% in year 2004 Send copies of environmental policy to all the suppliers 25% in year 2001 50% in year 2002 75% in year 2003 100% in year 2004
PROGRAM	:	Continuous Education and Training

Actions

- Prepare questionnaire for suppliers to inculcate importance of the environment.
- Share our programs with the supplier to optimize pollution prevention.

Responsibility: _____

Signature/Date: _____

Policy no. 20A

Environmental Management System Program

POLICY No. 20A	:	Company will reduce the amount of waste we create: We will minimize our use of materials, design, and modify our operations to minimize waste production, use materials longer where practicable, and always investigate recycling opportunities for used materials.
OBJECTIVE	:	Prevent pollution by reducing waste generation by 7% of the present level by year 2007, using 1999 standard
TARGET	:	Reduce waste generation 1% in year 2001 (Quality Control) 1% in year 2002 (Quality Control) 1% in year 2003 (Production) 1% in year 2004 (Packaging) 1% in year 2005 (Stores) 1% in year 2006 (Maintenance) 1% in year 2007 (Administration)
PROGRAM	:	Waste Management

Actions

“Clean Up the World Campaign” aims at making individuals, companies, and communities more aware of local environment issues, particularly the importance of reducing waste, recycling, and waste management.

Waste reduction initiatives

- Find out what waste is produced at your site.
- Ask if any of this waste can be reduced, and by whom.
- Make someone responsible for reducing waste.
- Establish waste collection points for recyclable items.
- Provide separate collection bins for each category of waste.
- Join a local waste minimization club or start one with companies on neighboring sites.
- Encourage employees to reduce waste, for example, by donating a percentage of any savings raised to a local charity.
- Use the minimum packaging needed.

- Return product packaging to suppliers—agree reduced packaging with customers/suppliers.
- Minimize or reuse your own product packaging (if appropriate).
- Reuse cardboard cartons and plastic bags.
- Compact nonrecyclable by-products to make disposal more manageable.

Responsibility: _____

Signature/Date: _____

Policy no. 20B

Environmental Management System Program

POLICY No. 20B	:	Company will reduce the amount of waste resulted from our operations. We will minimize our use of materials, design, and modify our operations to minimize waste production, use materials longer where practicable, and always investigate recycling opportunities for used materials.
OBJECTIVE	:	Prevent pollution by reducing waste of water by 5% of the present level by year 2002, using 1999 standard where possible
TARGET	:	Reduce waste generation 2% in year 2001 3% in year 2002
PROGRAM	:	Waste Management

Actions

- The basis of an effective waste minimization plan is a detailed waste water audit study. Such a plan will dramatically reduce water costs as well as the costs of treatment and disposal.
- Find out water is wasted at site and can be saved.
- A waste water minimization plan should consider:
 - Means of avoiding excessive water use/waste water generation
 - Means of reducing the strength of contaminant entering the waste stream
 - Means of water reuse/recycling
 - Unexplained water use outside "production" hours

Responsibility: _____

Signature/Date: _____

Policy no. 20C

Environmental Management System Program

POLICY No. 20C	:	Company will reduce the amount of waste resulted from our operations. We will minimize our use of materials, design, and modify our operations to minimize waste production, use materials longer where practicable, and always investigate recycling opportunities for used materials.
OBJECTIVE	:	Prevent pollution by 100% safe disposal of chemical waste by 2007
TARGET	:	Induce safe disposal of waste 5% in year 2001 5% in year 2002 10% in year 2003 10% in year 2004 20% in year 2005 25% in year 2006 25% in year 2007
PROGRAM	:	Waste Management

Actions

Recommendations/Guidelines

Permits

- Where appropriate, ensure that a permit is held for the discharge of all waste, to the sewer, land or the marine environment, are obtained from the local bodies. It would be useful to keep these on file for at least two years. Check that all waste contractors are licensed to take the waste (if appropriate).
- A condition of this permit is the periodic monitoring and reporting of the quantity and quality of this waste. If the quality of the waste exceeds prescribed standards, it may need to be disposed of as hazardous waste.

Responsibility: _____

Signature/Date: _____

Policy no. 21A

Environmental Management System Program

POLICY No. 21A	:	Conserve natural resources of water where technically and practically possible
OBJECTIVE	:	Minimize water use wherever technically and commercially practical
TARGET	:	Reduce water consumption at selected sites by 15% of the present levels within one year 5% in year 2001 (Gardening) 10% in year 2002 (Water Fall)
PROGRAM	:	Water Recycling

Actions

Install equipment to recycle water used for rinsing in process A for reuse in process B.

If the following policies are properly implemented, and expenditure over a similar time span is monitored, then the savings made can be calculated. Research shows that the average company could save 15% of its water and effluent bill by minimizing water use.

Recommendations/Guidelines

Measure and monitor consumption (cheap meters can be bought if need be), concentrating on the main areas of use.

Inside Buildings

- Encourage male staff to use the urinals provided for urinating and not the toilet cubicles, as is often the case. It is unnecessarily wasteful of water to flush away one person's urine. If, as is likely, many people are following this practice, an enormous amount of water is wasted over a period of one year. Cleaning time would also be reduced.
- The use of the Biomat system in the men's urinal toilets is a very useful and cost-effective system. The Biomat is an antiseptic,

scented mat that is placed in the urinal. It kills odors, maintains hygiene levels, and does not require the use of water for flushing. The urinal is cleaned and washed out at appropriate intervals.

- Passive infra-red (PIR) sensors are also a cost-effective way to save water for urinals. Research shows that companies using the older raised cistern (flush tank) for urinals can reduce water use by up to 70%. The PIR sensors typically use long-life batteries lasting three through four years (PIR sensors can be extended to control lighting and fans as well as water supplies).
- Fit “Hippos” (or even a plastic water bottle filled with water or sand) in toilet cisterns to reduce flush volumes. If flushing is subsequently ineffective then the levels of water/sand can be adjusted. Toilets plumbed after 1993 will probably have a 7.5 liter cistern. Through fitting “Hippos” in toilet cisterns, approximately 30% of the water will be saved with each flush regardless of the size of the cistern. 190,080 gallons (864,000 L) of water a year can be saved from 40 flush toilets (not including urinals).
- Test for leaking toilets by adding food coloring to the tank. If any color appears in the bowl after 30 min, then the toilet is leaking. A leaking toilet can waste up to 200 gallons of water per day.
- To reduce water wastage from sink taps (and shower heads), consider fitting spring-loaded return valves, in-line flow restrictors or spray taps, or timer/sensor controlled taps that work just as effectively as normal taps and only dispense water when required by operatives. (Low flow, high velocity showers use water efficiently. Typical water use for a shower is 35 liters, with power showers using substantially more.) Research shows the companies can reduce water use by up to 50% using flow restrictors from sink taps alone.
- Water wastage in food service areas is notoriously large—do not wash hands or kitchen equipment under running water.
- Ensure that dripping or leaking taps are quickly repaired—*(a tap that drips twice per second wastes 1200 gallons over a year)*. Leaks and burst pipes can be extremely costly, as the following data show:
 - A 1/2 inch water pipe loses 50 gallons per minute (gpm)
 - A 3/4 inch pipe loses 110 gpm
 - A 1 inch pipe loses 210 gpm
 - A 2 inch pipe loses 850 gpm

- A 3 inch pipe loses 1900 gpm
- A 4 inch pipe loses 3400 gpm
- If possible, check the water meter while no water is being used. If the dials are moving then there is a leak in the system.
- Report faults immediately.
- Where possible, collect the water from the air-conditioners in a rain barrel to use for outside watering (if appropriate).
- Ensure that hot water is stored at 60°C (approx. 145°F). Storing water below this temperature increases the risk of *Legionella*. Storing water above this temperature is unnecessary and wastes energy—reset the immersion heater thermostat if necessary.
- Pipe-work should be lagged as this ensures that hot water pipes provide hot water and cold water pipes provide cold water (especially important in summer).

Outside Buildings—Guidelines for the Reuse of Waste Water for Horticultural Purposes

The conservation of water is of such importance that recycling techniques have to be developed for every type of usage of water. Treating waste water for reuse is a specialist task and an explanation of the full range of possible separation technologies is beyond the scope of this report. A brief set of guidelines are included.

The use of treated waste water for irrigation, while bringing many benefits, has associated public health risks. Recycled water and sludge may spread diseases due to bacteria, worm eggs, and virus particulates present in the treated water or sludge, or due to bacteria that grow in the irrigation system. Warm, nutrient rich water is an ideal media for promoting the growth of organisms such as *Legionella*, and the correct treatment is therefore essential.

- For unrestricted irrigation (Class A waters): all sewage effluents must be treated to secondary standard, sand filtered and chlorinated. The maximum *E. coli* level in the final effluent shall be less than 1/100 mL.
- For restricted irrigation (Class B waters): the effluent shall be treated to secondary standard and *E. coli* level must be reduced to 1000/100 mL.

Irrigation Method	Permissible Water Class
Drip irrigation on to trees and bushes	A or B
Low mist hand spray	A or B
Spray irrigation in parks and green spaces that are closed to the public or after the hours of use, subject to a 2-h break before public use begins	A or B
Unlimited spray irrigation of public areas with precautions to reduce mist formation	A only

- Ensure that company meets the above standard or the treatment system must be upgraded within 6 months.
- Waste water irrigation points shall be regularly tested for bacteria including *Legionella*, especially where spray irrigation is practiced. Any branch of the network where *Legionella* is detected or where bacterial levels are elevated must be isolated and treated.
- Chlorine dioxide (or any other material of equivalent effectiveness) must be used to disinfect for *Legionella* and slime-borne organisms. Chlorination is not adequate for this purpose.
- The irrigation of recycled water shall be timed to avoid periods of public use.
- Drip irrigation applies water slowly to exactly the areas where it is needed with minimal wastage.
- If possible, irrigation of the grounds should take place at the coolest part of the day to minimize water lost to evaporation. Water administered during hot parts of the day (as has been observed) will either not be able to infiltrate far enough into the ground to reach plant roots (which will slowly turn toward the surface and eventually die) or required much larger volumes of water to do the same job. Furthermore, the likelihood of the plants being scorched is increased.
- All areas where recycled water is used shall be sign-posted to alert staff not to drink the water.
- Staff involved in the application of recycled water shall be subject to regular health evaluation.
- Irrigation waters shall be monitored at the point of application by taking the first water flushed from the line and collecting this in a 1 L sterile bottle. The point(s) chosen should provide statistical coverage of the irrigation area.

- Staff collecting irrigation waters should avoid all contact with the water and wear a high efficiency particle and mist face shield. Staff should wash their hands thoroughly after sampling.
- Water used in the decorative fountains at the entrance must also undergo the above safety checks to negate potential dangers to human health.

Responsibility: _____

Signature/Date: _____

Policy no. 22A

Environmental Management System Program

POLICY No. 22A	:	Company will reduce the amount of waste and will always investigate recycling opportunities for used materials. Embody life cycle thinking.
OBJECTIVE	:	Achieve recycling approach 50% of the present level by year 2005
TARGET	:	Optimize use of recycle products 25% in year 2003 (Stationery) 25% in year 2005 (Stationery)
PROGRAM	:	Recycling of office waste paper

Actions

Close the Recycling Loop—Collecting materials for recycling is only the beginning of the chain. *If you are not buying recycled, you are not recycling.*

Recommendations

Before considering recycling, there are other issues that need to be addressed. Ask yourself, “can I reduce my use of this item?” and “can I reuse this item before throwing it away?” First REDUCE, then REUSE, and only then RECYCLE.

- Paper is a natural resource that is reusable and *can be recycled up to five times*. Large amounts of the office waste paper could be collected in a separate container and taken away for recycling instead of thrown away with the general rubbish.
- Recycled stationery paper can be more expensive unless a lower grade of whiteness is accepted, though most general stationery items are used in-house and there is little justification to use products made from virgin materials where recycled alternatives exist.
- Paper could also be reused as most paper sent to waste has only been used on one side. Faxes and internal memos, for example,

could be sent on paper that has only been used on one side. Paper documents that require circulation could be enclosed in reusable envelopes, and so on.

Responsibility: _____

Signature/Date: _____

Policy no. 22B

Environmental Management System Program

POLICY No. 22B	:	Company will reduce the amount of waste and will always investigate recycling opportunities for used materials. Embody life cycle thinking.
OBJECTIVE	:	Achieve recycling approach 50% of the present level by year 2005
TARGET	:	Optimize use of recycle products 25% in year 2001 (Stationery) 25% in year 2002 (Stationery)
PROGRAM	:	Recycling of laser printer cartridges

Action

- Laser printer toner cartridges can be refilled or remanufactured (although not all cartridge types are recyclable). Also, check that the printer warranty is not affected and the supplier will guarantee to cover the cost of repair due to cartridge failure. The cost of recycling and using remanufactured toner cartridges can be very cost-effective, saving around 20% against new cartridges.

Responsibility: _____

Signature/Date: _____

Policy no. 22C

Environmental Management System Program

POLICY No. 22C	:	Company will reduce the amount of waste and will always investigate recycling opportunities for used materials. Embody life cycle thinking.
OBJECTIVE	:	Achieve recycling approach 50% of the present level by year 2005
TARGET	:	Optimize use of recycle products 25% in year 2003 (Stationery) 25% in year 2005 (Stationery)
PROGRAM	:	Recycling of desk-jet cartridges

Action

- Desk-jet cartridges can be refilled, which reduces waste and represents a considerable saving compared to buying a new product—an average of 50%. Ensure that the supplier handles these refills.

Responsibility: _____

Signature/Date: _____

Policy no. 22D

Environmental Management System Program

POLICY No. 22D	:	Company will reduce the amount of waste and will always investigate recycling opportunities for used materials. Embody life cycle thinking.
OBJECTIVE	:	Achieve recycling approach 50% of the present level by year 2005
TARGET	:	Optimize use of recycle products 25% in year 2003 (Stationery) 25% in year 2005 (Stationery)
PROGRAM	:	Procurement recyclable cartridges for laser and desk-jet printers

Action

- Consider the recyclability of cartridges when purchasing new printers.

Responsibility: _____

Signature/Date: _____

Policy no. 22E

Environmental Management System Program

POLICY No. 22E	:	Company will reduce the amount of waste and will always investigate recycling opportunities for used materials. Embody life cycle thinking.
OBJECTIVE	:	Achieve recycling approach 50% of the present level by year 2005
TARGET	:	Optimize use of recycle products 25% in year 2003 25% in year 2005
PROGRAM	:	Recycling of plastic waste from the company

Action

- Plastic vending cups used for drinking water could be kept, reused a second or third time by staff instead of them being thrown away after the first use. Permanent pottery mugs/cups or recyclable paper cups could be better alternatives. 250,000 plastic cups used over a period of a year equates to one tonne of waste! Reusing and recycling cups will reduce the amount spent on purchasing them and also reduce the amount of waste sent to landfill.

Responsibility: _____

Signature/Date: _____

Policy no. 22F

Environmental Management System Program

POLICY No. 22F	:	Company will reduce the amount of waste and will always investigate recycling opportunities for used materials. Embody life cycle thinking.
OBJECTIVE	:	Achieve recycling approach 50% of the present level by year 2005
TARGET	:	Optimize use of recycle products 25% in year 2003 25% in year 2005
PROGRAM	:	Procurement of recycled toilet paper

Action

- Recycled toilet paper is available at little or no extra cost with an acceptable level of quality.

Responsibility: _____

Signature/Date: _____

Policy no. 22G

Environmental Management System Program

POLICY No. 22G	:	Company will reduce the amount of waste and will always investigate recycling opportunities for used materials. Embody life cycle thinking.
OBJECTIVE	:	Achieve recycling approach 50% of the present level by year 2005
TARGET	:	Optimize use of recycle products 25% in year 2003 25% in year 2005
PROGRAM	:	Recycling

Action

- Rubbish could be collected in recycled refuse sacks.

Responsibility: _____

Signature/Date: _____

Policy no. 23A

Environmental Management System Program

POLICY No. 23A	:	Company will seek to reduce the consumption ozone-depleting substances (ODSs) where possible
OBJECTIVE	:	Reduce ozone-depleting substances consumption by 100% of the present level by year 2006, using 1999 standard
TARGET	:	Reduce ozone-depleting substances consumption 5% in year 2001 5% in year 2002 10% in year 2003 10% in year 2004 20% in year 2005 50% in year 2006
PROGRAM	:	Ozone-Depleting Substances Identifying in the Company Operation

Actions

Guidelines/Recommendations

The “controlled substances” (that must cease to be produced in, or imported by 2006, according to international legislation of the Montreal Protocol) shall include:

- CFC-11—Trichlorofluoromethane
- CFC-12—Dichlorodifluoromethane
- CFC-111—Trichloroethane (a.k.a. Methyl Chloroform)
- CFC-113—Trichlorotrifluoromethane
- CFC-114—Dichlorotetrafluoromethane
- CFC-115—Chloropentafluoromethane
- R-500—Dichlorodifluoro/Difluoromethane
- R-502—Chlorodifluoro/Chloropentafluoromethane
- Halon 1211—Bromochlorodifluoromethane
- Halon 1301—Bromotrifluoromethane
- Halon 2402—Dibromotetrafluoromethane

CCl₄—Carbon tetrachloride

CH₃CCl₃—Methyl chloroform

CH₃Br—Methyl bromide

HBFC—Hydrobromofluorocarbons

Responsibility: _____

Signature/Date: _____

Policy no. 23B

Environmental Management System Program

POLICY No. 23B	:	Company will seek to reduce the consumption of ozone-depleting substances (ODSs) where possible
OBJECTIVE	:	Reduce ozone-depleting substances consumption by 100% of the present level by year 2006, using 1999 standard
TARGET	:	Reduce ozone-depleting substances consumption 5% in year 2001 5% in year 2002 10% in year 2003 10% in year 2004 20% in year 2005 50% in year 2006
PROGRAM	:	Ozone-Depleting Substances reduction in Refrigeration and Air Conditioning System

Actions

- Refrigeration and air conditioning.
- Ensure that old fridges are properly disposed of so that CFCs are removed (refrigerant gases, of course, only affect the environment when released).
- New equipment should be specified to contain R134a (HFC) or, ideally, a hydrocarbon gas (Calor). R134a is generally the preferred substitute but, although it does not affect the ozone layer, this does have a severe global warming effect, raising some concerns. Other preferable substitutes include R125, R143a, and R22 that have low ozone depletion potential and are available on the market. R22, however, is a class II ozone-depleting substance and its use will eventually be phased out under the Montreal Protocol. Ammonia is sometimes used in primary circuits but can cause safety problems. It is recommended that future options are monitored and all measures taken to ensure minimal leakage of gases through regular maintenance. Losses (i.e., amounts needed to top-up systems during servicing) should be tracked.

- New equipment must not contain CFC's 11, 12, 113, 114, 115 (see above), and other halogenated CFCs.
- All existing air conditioning and refrigeration equipment utilizing the aforementioned controlled substances must be:
 1. Maintained leak-free
 2. Supplied with gases from existing supplies or recycled sources
 3. Converted to use approved alternative refrigerants
- The venting of controlled refrigerants during equipment maintenance is not permitted.
- Recovery, recycle, and reuse of refrigerants shall be practiced during repair and maintenance.

Responsibility: _____

Signature/Date: _____

Policy no. 23C

Environmental Management System Program

POLICY No. 23C	:	Company will seek to reduce the consumption of ozone-depleting substances (ODSs) where possible
OBJECTIVE	:	Reduce ozone-depleting substances consumption by 100% of the present level by year 2006, using 1999 standard
TARGET	:	Reduce ozone-depleting substances consumption 5% in year 2001 5% in year 2002 10% in year 2003 10% in year 2004 20% in year 2005 50% in year 2006
PROGRAM	:	Ozone-Depleting Substances reduction using cleaning products without CFCs

Actions

- Dry cleaning (if appropriate).
- All products containing CFC-113 and 111-Trichloroethane (also known as methyl chloroform) which are ozone-depleting substances shall not be used in new equipment.
- Owners of existing equipment shall investigate alternatives and shall inform the EPA within two years of the selected alternative and the deadline for decommissioning all equipment utilizing controlled substances.
- Alternative substances that have low ozone-depleting potential including, but not limited to, trichloroethane, perchloroethylene, and methylene chloride shall be used in dry cleaning activities.
- Company could examine whether there is a need to clean items at all and whether water-based caustic systems can be used before considering vapor and solvent degreasing systems.

Responsibility: _____

Signature/Date: _____

Policy no. 23D

Environmental Management System Program

POLICY No. 23D	:	Company will seek to reduce the consumption ozone-depleting substances (ODSs) where possible
OBJECTIVE	:	Reduce ozone-depleting substances consumption by 100% of the present level by year 2006, using 1999 standard
TARGET	:	Reduce ozone-depleting substances consumption 5% in year 2001 5% in year 2002 10% in year 2003 10% in year 2004 20% in year 2005 50% in year 2006
PROGRAM	:	Ozone-Depleting Substances reduction through selection of Fire Protection Materials free from ODSs

Actions

- Fire protection systems
 - Halons 1211, 1301, and 2402 shall not be used in any new fire protection system from January 1, 1996. Alternative fire suppressant substances already available shall be used in newly built fire protection systems.
 - The venting of Halons during repair and maintenance of existing fire protection systems is not allowed. Existing large premises shall install equipment to recover, recycle, and reuse Halon.
 - All Halon-filled cartridges or cylinders for fire extinguishers shall be regularly maintained and periodically serviced only to qualified premises with Halon recovery equipment to minimize leakages.
 - Keep a regular maintenance schedule for fire protection systems.

Responsibility: _____

Signature/Date: _____

Policy no. 23E

Environmental Management System Program

POLICY No. 23E	:	Company will seek to reduce the consumption of ozone-depleting substances (ODSs) where possible
OBJECTIVE	:	Reduce ODS consumption by 100% of the present level by year 2003, using 1999 standard
TARGET	:	Reduce CFCs consumption 10% in year 2001 (Carpentry Shop) 40% in year 2002 50% in year 2003
PROGRAM	:	Reduction of ODS through selection of organism solvent-free adhesive used for the repairs of Office Equipment—Fixtures and Fittings procurement

Action

- Avoid solvent-based wood preservatives (often organic volatile chemicals) and lacquers (which contain approx. 15% solvents).

Responsibility: _____

Signature/Date: _____

Policy no. 23F

Environmental Management System Program

POLICY No. 23F	:	Company will seek to reduce the consumption of ozone-depleting substances (ODSs) where possible
OBJECTIVE	:	Reduce ODS consumption by 100% of the present level by year 2003, using 1999 standard
TARGET	:	Reduce CFCs consumption 10% in year 2001 (Carpentry Shop) 40% in year 2002 50% in year 2003
PROGRAM	:	Reduction of ODS through selection of organism solvent-free adhesive used for the repairs of Office Equipment—Fixtures and Fittings procurement

Action

- Avoid solvent-based wood preservatives (often organic volatile chemicals) and lacquers (which contain approx. 15% solvents).

Responsibility: _____

Signature/Date: _____

Policy no. 23G

Environmental Management System Program

POLICY No. 23G	:	Company will seek to reduce the consumption of ozone-depleting substances (ODSs) where possible
OBJECTIVE	:	Reduce ODS consumption by 100% of the present level by year 2003, using 1999 standard
TARGET	:	Reduce CFCs consumption 10% in year 2001 (Carpentry Shop) 40% in year 2002 50% in year 2003
PROGRAMME	:	Recycling based Office Equipment—Fixtures and Fittings procurement

Action

- Investigate packaging—recyclable content, recyclability, and retrieval.

Responsibility: _____

Signature/Date: _____

Policy no. 23H

Environmental Management System Program

POLICY No. 23H	:	Company will reduce the amount of waste and will always investigate recycling opportunities for used materials
OBJECTIVE	:	Reduce tropical hardwood consumption by 100% of the present level by year 2004, using 1999 standard
TARGET	:	Reduce tropical hardwood consumption 25% in year 2001 (Carpentry Shop) 25% in year 2002 25% in year 2003 25% in year 2004
PROGRAM	:	Procurement of nontropical wood for office Equipment— Fixtures and Fittings manufacturing in house

Action

Recommendation

- Avoid tropical hardwoods and check the sources of raw materials—furniture and other fittings may contain timber from unmanaged forests. Sustainably managed and grown temperate hard and softwoods from North America, Europe, and Russia are preferable. Consider wood substitutes.

Responsibility: _____

Signature/Date: _____

Policy no. 23I

Environmental Management System Program

POLICY No. 23I	:	Company will seek to reduce the consumption of ozone-depleting substances (ODSs) where possible
OBJECTIVE	:	Reduce ODS consumption by 100% of the present level by year 2003, using 1999 standard
TARGET	:	Reduce CFCs consumption 10% in year 2001 (Carpentry Shop) 40% in year 2002 50% in year 2003
PROGRAM	:	Environmental-friendly Office Equipment—Fixtures and Fittings procurement

Action

- Avoid products where CFCs (ODS) are used as a blowing agent.

Responsibility: _____

Signature/Date: _____

300.60-1

Practical Help

Virtual Pharmaceutical Industries

The intention of Chapter 300.60.1 is to provide the end users with the practical help, how to walk through ISO 14001:2004 Environmental Management System development using the ready use attachments provided at the end of the standard operating procedures. The attachments are filled based on the following assumption; however, the individual user should identify and build requirements specific to their operations, that is, products and services.

The similarity in the contents of the hypothetically filled attached forms may be incidental and does not provide any guarantee to the end users concerning the specific needs and the legislations applicable from one country to another.

Assumption

Virtual Pharmaceutical Industries is located in (Address) the United States. It is involved in finished pharmaceuticals manufacturing of the following dosage forms and supporting operations.

- Tablets processing
- Capsule processing
- Powder processing
- Semisolid processing
- Liquid processing
- Sterile processing
- Sterile powder filling

- Plastic dosing cups manufacturing plant
- Aluminum caps manufacturing plant

Following is the list of sources of aspects identified jointly by the key departmental manager in coordination with the EMS coordinator.

1. Waste treatment plant
2. Steam generation/boilers (light diesel oil)
3. Burning diesel (electricity generator)
4. HVAC system CFCs
5. Plastic dosing cups manufacturing plant
6. Aluminum caps manufacturing plant
7. Transportation
8. Laundry
9. Kitchen
10. Civil work and maintenance
11. Tablets processing
12. Capsule processing
13. Powder processing
14. Semisolid processing
15. Liquid processing
16. Sterile processing
17. Sterile powder filling
18. QC & PDL laboratory
19. Stores
20. Administration
21. Civil work and construction

On the basis of the above-mentioned information, the company decided to establish the ISO 1400:2004 Environmental Management System. The attachments provided in the Practical Help section are provided as a guideline or are filled as an example for the end users. The contents filled in the examples do not guarantee the end users to follow the same concerning their operational environment (see [Table 1](#)).

Table 2 provides Virtual Pharmaceutical Industries Environmental Aspects Significance Evaluation Matrix.

In Table 3, the local municipality environmental protection and safety technical guidelines are listed. Table 4 provides information about the action programs and the concerned department. The operational control procedures of the Virtual Pharmaceutical Industries are listed in Table 5. The environmental policy of the Virtual Pharmaceutical Industries is described in Table 6. The attachments are listed under Section 300.60.1. However, the specific attached number is identified by its number within parentheses at the end of the section, such as 300.60.1.4.1(1).

List of Referenced SOPs with Filled Attachments

TABLE 1

Section	Subject	SOP no.	Template	Comments
1	General requirements	EMS-4.1	EMS-4.1(1)	Example
			EMS-4.1(2)	Example
			EMS-4.1(3)	Example
			EMS-4.1(4)	Example
			EMS-4.1(5)	Example
			EMS-4.1(6)	Guide
			EMS-4.1(7)	Guide
			EMS-4.1(8)	Guide
			EMS-4.1(9)	Guide
			EMS-4.1(10)	Guide
			EMS-4.1(11)	Example
			EMS-4.1(12)	Example
			EMS-4.1(13)	Example
			EMS-4.1(14)	Example
2	Environmental policy	EMS-4.2	EMS-4.2(1)	Guide
			EMS-4.2(2)	Example
			EMS-4.2(3)	Example
3	Planning	EMS-4.3	EMS-4.3(1)	Example
			EMS-4.3(2)	Guide
			EMS-4.3(3)	Guide
3.1	Environmental aspects	EMS-4.3.1	EMS-4.3.1(1) A to U	Example
			EMS-4.3.1(2) A to I	Example
			EMS-4.3.1(3) A to K	Example
			EMS-4.3.1(4) A to B	Example
			EMS-4.3.1(5) A to C	Example
3.2	Legal and other requirements	EMS-4.3.2	EMS-4.3.2(1)	Example
			EMS-4.3.2(2)	Guide
			EMS-4.3.2(3)	Guide
			EMS-4.3.2(4)	Guide
			EMS-4.3.2(5)	Guide
			EMS-4.3.2(6)	Guide
3.3	Objectives and targets	EMS-4.3.3	EMS-4.3.3(1) A to M	Example
			EMS-4.3.3(2)	Example
			EMS-4.3.3(3)	Example
3.4	Environmental management program(s)	EMS-4.3.4	EMS-4.3.4(1)	Guide

TABLE 1 (continued)

Section	Subject	SOP no.	Template	Comments
4	Implementation and operation	EMS-4.4	EMS-4.4(1)	Guide
			EMS-4.4(2)	Guide
			EMS-4.4(3)	Example
			EMS-4.4(4)	Guide
			EMS-4.4(5)	Guide
4.1	Resources, roles, responsibility, and authority	EMS-4.4.1	EMS-4.4.1(1)	Example
			EMS-4.4.1(2)	Guide
4.2	Competence, awareness, and training	EMS-4.4.2	EMS-4.4.2(1)	Guide
			EMS-4.4.2(2)	Guide
			EMS-4.4.2(3)	Example
4.3	Communication	EMS-4.4.3	EMS-4.4.3(1)	Guide
4.4	Documentation	EMS-4.4.4	EMS-4.4.4(1)	Guide
4.5	Control of document	EMS-4.4.5	EMS-4.4.5(1)	Guide
			EMS-4.4.5(2)	Example
			EMS-4.4.5(3)	Example
			EMS-4.4.5(4)	Example
4.6	Operational control	EMS-4.4.6	EMS-4.4.6(1)	Example
4.7	Emergency preparedness and response	EMS-4.4.7	EMS-4.4.7(1)	Example
			EMS-4.4.7(2)	Example
5	Checking and corrective action	EMS-4.5	EMS-4.5(1)	Guide
			EMS-4.5(2)	Guide
5.1	Monitoring and measurement	EMS-4.5.1	EMS-4.5.1(1)	Guide
5.2	Evaluation of compliance	EMS-4.5.2	EMS-4.5.2(1)	Example
5.3	Nonconformity, corrective action, and preventive action	EMS-4.5.3	EMS-4.5.3(1)	Guide
5.4	Control of records	EMS-4.5.4	EMS-4.5.4(1)	Guide
5.5	Internal audit	EMS-4.5.5	EMS-4.5.5(1)	Guide
			EMS-4.5.5(2)	Guide
			EMS-4.5.5(3)	Guide
6	Management review	EMS-4.6	EMS-4.6(1)	Guide

Note: NR = Not required.

TABLE 2

Environmental Aspect Significance Evaluation Matrix

No.	Source	Activity	Date	Product	Services	Location	Area
A.1	Waste water treatment	Recycling	mm/dd/yyyy	N/A	N/A	Waste water treatment	Utilities
A.2	Steam generation/ Boilers (light diesel oil)	Steam generation	mm/dd/yyyy	N/A	Steam generation	Boiler plant	Boiler room
A.3	Burning of diesel (electricity generation)	Power generation	mm/dd/yyyy	N/A	Electricity generation	Generator plant	Plant I, II, III, & administration, housing
A.4	HVAC systems CFCs	Cooling	mm/dd/yyyy	N/A	Air conditioning	Technical floor plant I, II, III, & administration	Plant I, II, III, & administration offices
A.5	Plastics	Manufacturing	mm/dd/yyyy	Plastic dosing cups	Plastic dosing cups manufacturing	Near admin. block	Plastic dosing cups Mfg. plant
A.6	Aluminum	Manufacturing	mm/dd/yyyy	Aluminum caps	Aluminum caps manufacturing	Near admin.	Aluminium caps Mfg. plant
A.7	Transportation	Shipping	mm/dd/yyyy	All products	N/A	Ras-Al-Khaimah	Inside & outside UAE
A.8	Laundry	Washing	mm/dd/yyyy	Washing of Lab. coats and uniforms	Steam generation	Washing room	Laundry
A.9	Kitchen	Cooking	mm/dd/yyyy	N/A	Catering	Administration	Administration
A.10	Civil works and maintenance	—	mm/dd/yyyy	N/A	Carpentry/ Fabrication/ Construction/ Cement manufacturing	Maintenance	Workshop & cement mixing plant

A.11	Tablets processing	Tabletting	mm/dd/yyyy	All tablet products	N/A	Plant I	Mfg. & Pkg. solids
A.12	Capsules processing	Capsulation	mm/dd/yyyy	All capsules	N/A	Plant II	Mfg. & Pkg.
A.13	Powders processing	PPS manufacturing	mm/dd/yyyy	PPS	N/A	Plant II	Mfg. & Pkg.
A.14	Semisolids processing	Semisolid manufacturing	mm/dd/yyyy	All creams, ointments, and suppositories	N/A	Plant III	Mfg. & Pkg.
A.15	Liquids processing	Liquid products manufacturing	mm/dd/yyyy	All syrups, suspensions, and drops	N/A	Plant III	Mfg. & Pkg.
A.16	Sterile processing	Sterile manufacturing	mm/dd/yyyy	All terminally and aseptically sterilized products, ready-to-use syringes, and lyophilized products	N/A	Plant III	—
A.17	QC lab and PDL lab	Testing formulation	mm/dd/yyyy	N/A	N/A	Plant I, II, & III	Admin. Bldg.
A.18	Stores	Storage	mm/dd/yyyy	N/A	N/A	Plant I, II, & III	Inside & outside the factory
A.19	Administration	Routine operations	mm/dd/yyyy	N/A	N/A	Offices	Plant I, II, III Admin. Bldgs.
A.20	Civil works and maintenance	—	mm/dd/yyyy	N/A	Carpentry/ Fabrication/ Construction/ Cement manufacturing	Maintenance	Workshop & cement mixing plant

TABLE 3**Local Municipality Environmental Protection & Safety Technical Guidelines**

Number 1	Application for Waste Discharge Permits to Sewer, Land, and Marine Environment
Number 2	Guidelines for Waste Audit Reports
Number 3	Guidelines for Safety Audit Reports
Number 4	Guidelines for Preparation of Environmental Impact Statements for New Industrial Premises
Number 5	Oil Spill Response and Preparedness
Number 6	Industrial Compressed Gas Cylinders
Number 7	Heat Stress at Work
Number 8	Entry into Confined Spaces
Number 9	Electrical Safety at Work
Number 10	Guarding of Dangerous Machinery
Number 11	Approval of Swimming Pool Plans
Number 12	Requirement for Waste Water Separators
Number 13	Industrial Waste Water Disposal
Number 14	Personal Protective Equipment—Head Protection
Number 15	Personal Protective Equipment—Eye and Face Protection
Number 16	Personal Protective Equipment—Hearing Protection
Number 17	Personal Protective Equipment—Protective Clothing
Number 18	Personal Protective Equipment—Hand Protection
Number 19	Personal Protective Equipment—Foot Protection
Number 20	Personal Protective Equipment—Fall Protection/Safety Lines
Number 21	Personal Protective Equipment—Respiratory Protection
Number 22	Safe Use of Industrial Organic Solvents
Number 23	Procedures for Testing the Leaching Characteristics of Hazardous Wastes
Number 24	Sampling of Hazardous Wastes
Number 25	First-Aid Requirements
Number 26	Application for Approval to Dispose of Hazardous Wastes
Number 27	Annual Approvals for Hazardous Waste Disposal
Number 28	Minimization of Industrial Waste Water
Number 29	Requirements for the Discharge of Waste Gases, Fumes, and Dusts to the Atmosphere
Number 30	Paint Spray Booths
Number 31	Safety in Vehicle Repair and Servicing Shops
Number 32	Acetylene Generators
Number 33	Disposal of Outdated Pharmaceuticals and Medicines
Number 34	Requirements for the Use of Waste Oil in Boilers and Furnaces
Number 35	Guidelines of Sampling, Preservation, and Analysis of Water and Waste Water Samples

TABLE 3 (continued)**Local Municipality Environmental Protection & Safety Technical Guidelines**

Number 36	Guidelines for Service Station Waste Disposal
Number 37	Transport of Nonhazardous Liquid Wastes by Tank Vehicles
Number 38	Health & Safety in Kitchens & Food Preparation Areas
Number 39	Septic Tank/Soak Away Design
Number 40	Examination and Certification of Boilers and Pressure Vessels
Number 41	Examination and Certification of Cranes, Hoists, Lifts, and Other Lifting Appliances
Number 42	Requirements for Concrete Batching Plants
Number 43	Placarding of Vehicles Carrying Dangerous Goods
Number 44	Requirements for the Reduction of Construction/ Demolition Noise
Number 45	Requirements for the Control of Entertainment Noise
Number 46	Clearance of Dangerous Goods
Number 47	Guidelines for the Disposal of Used Chemical Containers
Number 48	Safety in Handling Asbestos
Number 49	Hazardous Waste Exemption Policy
Number 50	Requirements for the Transport of Hazardous Waste
Number 51	Sampling and Preservation of Water Borne Oils
Number 52	Metal Finishing Industries
Number 53	Environmental Impact Assessment Procedures
Number 54	Clean-up of Contaminated Land
Number 55	Replacement of CFCs in Degreasing and Cleaning
Number 56	Establishment of Environmental Management Systems—Implementation of ISO-14001
Number 57	Bundling of Storage Tanks and Transfer Facilities
Number 58	Policy on the Control of Ozone-Depleting Substances
Number 59	Management of Medical Wastes from Clinics and Laboratories
Number 60	Approval of Environmental Auditors
Number 61	Development of Emergency Response Procedures for Accidents Involving Dangerous Goods
Number 62	The Reuse and Irrigation of Waste Water and Sludge
Number 63	Environmental Guidelines for Tourists and Leisure Travel within the Country
Number 64	Safety, Health & Environment Requirements for Laundry Operations
Number 65	Liquefied Petroleum Gas Cylinders

TABLE 4

Department	Action Plan/Program
Utilities (Maintenance) Waste Water Treatment Plant Action Plan/Program Review Update up to mm/dd/yyyy	AP1
Utilities (Maintenance)	AP1
Utilities (Maintenance)	AP2
Steam Generation (Boilers) Action Plan/Program Review Update up to mm/dd/yyyy	
Electrical & Electronics	AP3
Action Plan/ Program Review Update up to mm/dd/yyyy	
HVAC (Maintenance)	AP4
Action Plan/Program Review Update up to mm/dd/yyyy	
Plastic Dosing Cup Plant	AP5
Action Plan/Program Review Update up to mm/dd/yyyy	
P.P. Cap Plant	AP6
Action Plan/Program Review Update up to mm/dd/yyyy	
Administration	AP7
Action Plan/Program Review Update up to mm/dd/yyyy	
Utilities/ Laundry	AP8
Action Plan/Program Review Update up to mm/dd/yyyy	
Cafeteria	AP9
Action Plan/Program Review Update up to mm/dd/yyyy	
Maintenance	AP10
Action Plan/Program Review Update up to mm/dd/yyyy	
All Departments	AP11
Action Plan/Program Review Update up to mm/dd/yyyy	
QC & PDL	AP12
Action Plan/Program Review Update up to mm/dd/yyyy	
Stores	AP13
Action Plan/Program Review Update up to mm/dd/yyyy	
Administration	AP14
Action Plan/Program Review Update up to mm/dd/yyyy	

TABLE 5
Operational Controls/Procedures & Record Required

EMS-008	Waste Water
EMS-009	Waste
EMS-010	Measurement & Monitoring Recycled Water Produced and Used for Irrigation Utilities (Maintenance)
EMS-011	Measurement & Monitoring Waste Water Treatment Plant Waste Sludge Produced and Safely Disposed Utilities (Maintenance)
EMS-012	Measurement & Monitoring Waste Treatment Plant Utilities (Maintenance)
EMS-113	Boilers
EMS-114	Measurement & Monitoring Fuel Consumption Electrical Department (Generator)
EMS-115	Measurement & Monitoring Oil Consumption Electrical Department (Generator)
EMS-116	HVAC System Optimization & Energy
EMS-117	Stand-Alone Fridges and Freezers
EMS-118	Ozone-Depleting Substances
EMS-119	Measurement & Monitoring HVAC System Consumption of CFC's
EMS-120	Measurement & Monitoring HVAC System Consumption of R22
EMS-121	Measurement & Monitoring HVAC System Consumption of R11
EMS-122	Measurement & Monitoring Plastic Pallets Consumptions Plastic Dosing Cups Manufacturing Plant
EMS-123	Measurement & Monitoring Aluminum Sheet Consumption Aluminum Caps Manufacturing Plant
EMS-124	Transport
EMS-125	Dry Cleaning
EMS-126	Laundry
EMS-127	Kitchen
EMS-128	Dishwashers
EMS-129	Catering

continued

TABLE 5 (continued)

Operational Controls/Procedures & Record Required

EMS-130	Hazardous Substances
EMS-131	Electrical Equipment and Machinery
EMS-132	Waste Reduction/Minimization Initiatives
EMS-133	Fire Protection Systems
EMS-134	Stationary & Office Supplies
EMS-135	Photocopy Machines
EMS-136	Office Equipment & Fixtures & Fittings
EMS-137	Recycling
EMS-138	Measurement & Monitoring Volatile Organic Solvents (VOSs) Quality Control Dept. and Product Development Lab
EMS-139	Measurement & Monitoring Chlorinated Solvents (ODS) Quality Control Dept. and Product Development Lab

TABLE 6

Environmental Policy

Virtual Pharmaceutical Industries (VPI) commit itself to conduct our operations in compliance with relevant local environmental legislation and regulations applicable, with other requirements to which the organization is associated, which provides the framework for setting and reviewing environmental objectives and targets. In the absence of governmental regulation, we operate in an environmental responsible manner.

The VPI are committed to the following:

AP1: VPI will conserve the natural resources of water through recycling and optimization of consumption where technically and practically possible.

AP2: To comply with the legislation of local environmental requirements for the discharge of controlled and uncontrolled emission to atmosphere due to company's operations, activities, and services.

AP3: VPI recognizes the interrelation between energy and the environment, and will promote the efficient use of energy throughout our system.

AP4: VPI will seek measures to reduce the consumption of ozone-depleting substances (ODSs) through effective maintenance of its HVAC system.

AP5: VPI will encourage the recycling of plastic waste through continuous awareness programs for the staff and the customers.

AP6: VPI will reduce and encourage the safe disposal and recycling of aluminum waste through continuous customer awareness programs.

AP7: VPI will reduce the impact of its transport operations by maximizing the efficiency of routes and optimization of vehicles maintenance and awareness programs for the drivers.

AP8: VPI will adopt means and ways to manage the disposal of hazardous substances and minimize their consumption where possible.

AP9: VPI will educate, train, and motivate employees to carry out their tasks in an environmental responsible manner.

AP10: VPI will reduce the amount of waste resulted from its operations. We will minimize use of materials, design, and modify operations to minimize waste generation where possible.

AP11: VPI will periodically conduct environmental system audits based on ISO 14001 to continually improve our environmental performance.

AP12: Work toward sustainable development of the Environmental Management System (EMS) for its pharmaceutical manufacturing, packaging process, and associated support functions.

AP13: Encourage the use of EMS by bulk pharmaceutical manufacturers and packaging materials suppliers.

Directors, each departmental manager, and staff are responsible with his/her scope of operation for the implementation of the environmental system under the guidance of the EMS coordinator.

**General Manager
Virtual Pharmaceutical Industries**

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (1)

Activities/Products and Services

Aspect	Prepared by (Concerned Manager)	Aspect	Impact	Annual Quantities	Annual Value
Activities Steam generation Boilers operation	Utilities manager	Light diesel oil	<ul style="list-style-type: none"> • Pollution • Global warming • CO₂ and CO emission • Air pollution 	XYZ	XYZ
Products Tablets processing	Production manager	Dust generation	Air pollution	300 kg	600 US\$
Services Shipping	Transportation	Light diesel oil	Ozone depletion	50,000 L	10,000 US\$

Reviewed by:

(EMS Coordinator)

 Signature

 Date

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (2)

Significant Aspects (List)

Aspects	Prepared by (Concerned Manager)	Technique Used	Significant, Impact on Environment
Activities 1) Steam generator 2) 3) 4) 5) 6) 7) 8)	Utilities manager	<ul style="list-style-type: none"> • Questioner ✓ • Interview • Checklist • Direct inspections measurements • Record review • Benchmarking 	Emission of CO and CO ₂
Products 1) Tablet processing 2) 3) 4) 5) 6) 7)	Production manager	<ul style="list-style-type: none"> • Questioner ✓ • Interview • Checklist • Direct inspections measurements • Record review • Benchmarking 	Air pollution
Services 1) Transportation 2) 3) 4) 5) 6) 7)	Shipping manager	<ul style="list-style-type: none"> • Questioner ✓ • Interview • Checklist • Direct inspections measurements • Record review • Benchmarking 	Ozone depletion

Reviewed by:

(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (3)

Internal and External Legal Requirements Review

Aspects	Reviewed by (Concerned Manager)	Current Practice	Internal Requirement	External Legal Requirements	Remarks
Activities 1) 2) 3) 4) 5) 6) 7) 8)	Utilities	Refer to Attachment 4.3.1 (B)	Yes	Local regulations	Review required
Products 1) 2) 3) 4) 5) 6) 7) 8)	Production manager	Refer to Attachment 4.3.1 (K)	Yes	Local regulations	Review required
Services 1) 2) 3) 4) 5) 6) 7) 8)	Transportation	Refer to Attachment 4.3.1 (G)	Yes	Local regulations	Review required

Reviewed by: _____ **Signature** _____ **Date** _____
 (EMS Coordinator)

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (5)

Customers Feedback

Aspects	Customer Concerned	Remarks (Concerned Manager)
Activities 1) Steam generator 2) 3) 4) 5)	Local regulation	Monitoring required
Products 1) Tablets 2) 3) 4) 5)	Employees	Dust to be controlled and monitored
Services 1) Transportation 2) 3) 4) 5)	<ul style="list-style-type: none"> • Local population • Health 	Monitoring and control required

Reviewed by:

(EMS Coordinator)

 Signature

 Date

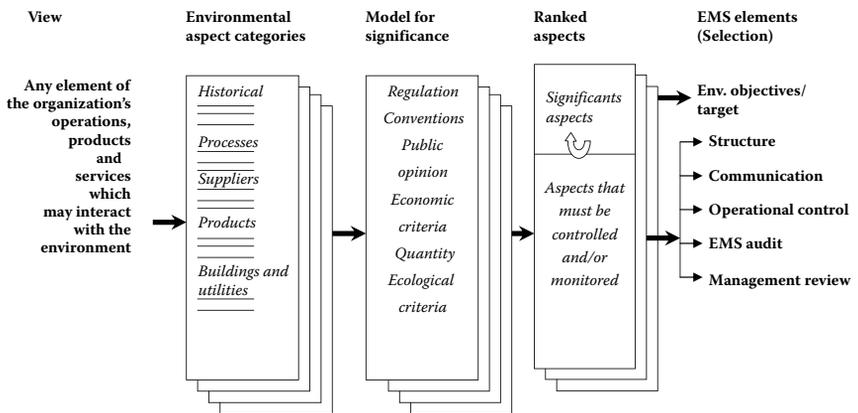
SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (6)

General Overview of the Aspects Identification Process



SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (7)

Examples of Legal Requirements List

Regulation	Application	Procedure
Air		
Environmental Protection Act 1990	Solvents to atmosphere	xxx
Environmental Protection Regulation 1991	Solvents to atmosphere	xxx
Environmental Protection Regulation 1993	Solvents to atmosphere	
Water		
Surface Waters Regulations	Discharge to water course	xyz
Water Resource Act	Discharge to cooling water to sewer	yyy
Control of Pollution Act	Discharge to cooling water to sewer	
Waste		
Environmental Protection Act	Waste management	zzz, xy, yz

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (8)

Examples of Product Aspects

Product	Aspect	Amount	Comment
Motors	Energy loss	Moderate	Small improvement in energy efficiency gives large change in lifetime impact
	Recyclability	High	
	Maintenance materials	Solvents needed	
	Noise	High	
Gas turbines	Energy loss	Low	Small improvement in energy efficiency gives large change in lifetime impact
	Recyclability	High	
	Maintenance chemical	Solvents needed	
Filters for yyy duty	Resource content	High	Filter is special waste at end of life due to contamination
	Recyclability	Nil	
	Eco-toxicity	High	
Rail vehicles, aluminum bodyshell	Resource content	High	Many other aspects known. Full LCA to be integrated into design process
	Energy content	High	
	Energy consumption	High	
	Recyclability	85%	
	Noise production	Moderate	
	Cd contamination from conductor wire	Low	
Rail vehicles, composite bodyshell	Resource content	Moderate	Many other aspects known. Full LCA to be integrated into design process
	Energy content	Low	
	Energy consumption	Low	
	Recyclability	Nil	
	Noise production	Moderate	
	Cd contamination from conductor wire	Low	

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (9)

Example of a Supplier Aspects List

Supplier	Materials	Aspects	Notes
A company	Molded plastic components	Discharge of VOCs to atmosphere. Consumption of nonrenewable resource	Emissions likely to have significant odour
B company	Plastic-insulated power cables	Discharge of VOCs to atmosphere	Low emissions
C company	Steel forgings	Consumption of large quantities of water for steel manufacture	Looking at recycle
D company	Chromium-plated metal parts	Discharge of chromium waste to watercourse	Prosecuted twice May go out of business We need alternative
E company	Solvent-based paints	Discharge of large quantities of VOCs to atmosphere	Looking to reduce emissions
F company	Hardwood flooring	Consumption of tropical hardwoods from nonmanaged forests	Supplies from managed sources now available. We will switch at end of contract
G company	Oils and lubricants	Consumption of nonrenewable resource. Sulphur dioxide emissions	Recently prosecuted for environmental damage to protected estuary
H company	Steel castings	Dust emissions to atmosphere, energy consumption, carbon dioxide emissions	Local pressure due to dust emissions
I company	Painted bodyshells	VOC emissions to atmosphere	Largest single source of VOCs in region. Abatement plan to be considered

SOP no.: EMS-4.1

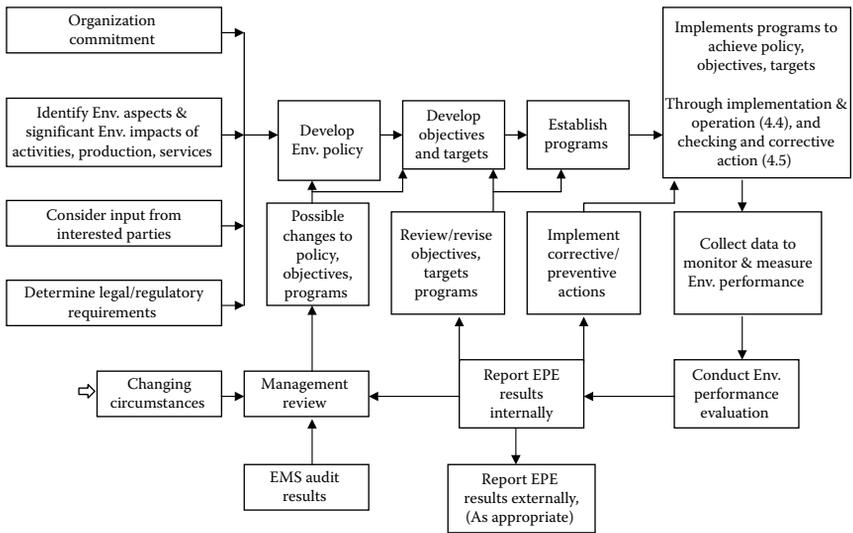
Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (10)

Inter-Relation of ISO 14001 Clauses

The flow chart below shows the elements of an EMS and how they relate to each other.



SOP no.: EMS-4.1
Issue date: mm/dd/yyyy
Revision no.: New

Attachment no. 4.1 (11)

Initial Internal Review

Prepared by: Concerned Manager

ENVIRONMENTAL ASPECT	Reference Plan		Emit Noise		Monitored		Legal Requirements		Responsible for Monitoring		Objective Set		Target Set		Procedure Monitoring and Control		Staff Trained		Audits Conducted		Qualification		EMS Programs		Management Reviews		Remarks
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	
NOISE POLLUTION																											
AIR POLLUTION • Emissions	✓		✓		✓		Local legislation		Mr. David		OT2A OT2B OT2C		OT2A		EMS-111 EMS-112 EMS-113		Mr. David		EMS coordinator		Certified boiler operator		AP2		EMS coordinator & team		To be reviewed
SOIL AND GROUND WATER PROTECTION • Hazardous materials • Storage areas • Tanks • Ground water • Spills • Integrity testing (Tanks) • Contractors																											

<p>SOLID AND HAZARDOUS WASTE</p> <ul style="list-style-type: none"> • Solid • Hazardous waste • Special waste • Clinical waste • Waste disposal on site • Hold waste management • Waste is disposed by contractor • Underground storage tanks • Nonhazardous waste • Toxic substances • Transportation • Nuclear materials • Other: (Please list) 																				Satisfactory
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--------------

Reviewed by:
(EMS Coordinator)

Signature

Date

Attachment no. 4.1 (12)

Initial Internal Review

Prepared by: Concerned Manager

ENVIRONMENTAL ASPECT	Reference Plan		Emit Noise		Monitored		Legal Requirements		Responsible for Monitoring		Objective Set		Target Set		Procedure Monitoring and Control		Staff Trained		Audits Conducted		Qualification		EMS Programs		Management Reviews		Remarks
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	
• Major accidents		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Not Applicable
• Hazards regulations		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Not Applicable
• Ozone-depleting substances		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Not Applicable
• Poly-chlorinated biphenyls		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Not Applicable
• Special process requirements		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Not Applicable
• Products controlling growth of natural		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Not Applicable
– Flora		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Not Applicable
– Fauna		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Not Applicable
– Promote wildlife		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Not Applicable
– Recreational facilities		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Not Applicable
– Parks		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Not Applicable

Y = Yes

N = No

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.1
 Issue date: mm/dd/yyyy
 Revision no.: New

Attachment no. 4.1 (13)

Initial Internal Review

Prepared by: Concerned Manager

RESOURCE MANAGEMENT ASPECT	Reference Plan		Emit Noise		Monitored		Legal Requirements		Responsible for Monitoring		Objective Set		Target Set		Procedure Monitoring and Control		Staff Trained		Audits Conducted		Qualification		EMS Programs		Management Reviews		Remarks
	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	
• Water consumption	✓			✓	✓			✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Satisfactory
• Fuel	✓			✓	✓					✓		✓		✓		✓		✓		✓		✓		✓		✓	Satisfactory
• Electricity	✓			✓	✓			✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Satisfactory
• Recycling activities	✓																										
– Products		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Satisfactory
– Materials	✓	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Satisfactory
– Process		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Refer plan required
• Use of land				✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Satisfactory
• Activities leading to	✓					✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
– Odor		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Satisfactory
– Dust		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Satisfactory
– Vibrations		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Satisfactory
– Visual impact		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	Satisfactory

Reviewed by:
 (EMS Coordinator)

 Signature

 Date

SOP no.: EMS-4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.1 (14)

Final Management System Assessment Review (Internal)

Prepared by: Concerned Manager

Management System	Yes	No	Date	Remarks
• Environmental aspects identified of activities, products, or services	✓		mm/dd/yyyy	Satisfactory (or if any)
• Aspects of significance impact on environment determined	✓		mm/dd/yyyy	Satisfactory (or if any)
• The top 5 impacts determined	✓		mm/dd/yyyy	Satisfactory (or if any)
• Objectives and targets made	✓		mm/dd/yyyy	Satisfactory (or if any)
• Policy documented authorized	✓		mm/dd/yyyy	Satisfactory (or if any)
• Policy made available to public	✓		mm/dd/yyyy	Satisfactory (or if any)
• EMS integrated with				
– Quality system	✓		mm/dd/yyyy	Satisfactory (or if any)
– Health and safety	✓		mm/dd/yyyy	Satisfactory (or if any)
– None	✓		mm/dd/yyyy	Satisfactory (or if any)
• Regulatory requirements listed	✓		mm/dd/yyyy	Satisfactory (or if any)
• Program made for EMS	✓		mm/dd/yyyy	Satisfactory (or if any)
• EMS responsibilities defined	✓		mm/dd/yyyy	Satisfactory (or if any)
• EMS coordinator appropriated	✓		mm/dd/yyyy	Satisfactory (or if any)
• Training provide on				
– Communication	✓		mm/dd/yyyy	Satisfactory (or if any)
– Documentation	✓		mm/dd/yyyy	Satisfactory (or if any)
– Document control	✓		mm/dd/yyyy	Satisfactory (or if any)
• Conditions considered				
– Normal	✓		mm/dd/yyyy	Satisfactory (or if any)
– Abnormal	✓		mm/dd/yyyy	Satisfactory (or if any)
– Accidents/emergencies	✓		mm/dd/yyyy	Satisfactory (or if any)

Reviewed by: _____
 (EMS Coordinator) **Signature** **Date**

Approved by: _____
 (General Manager) **Signature** **Date**

SOP no.: EMS-4.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.2 (1)

Responsibilities

Copy To: All Concerned

Environmental Responsibilities	Typical Person(s) Responsible
Establish overall direction	General manager, chief executive officer (CEO), board of directors
Develop environmental policy	President, Environmental Management System (EMS) coordinator
Develop environmental objectives, targets, and programs	Relevant managers
Monitor overall EMS performance	Chief environmental manager
Assure regulatory compliance	Senior operating manager
Ensure continual improvement	All managers
Identify customers expectations	Sales and marketing staff
Identify suppliers expectations	Purchasers and buyers
Develop and maintain accounting procedures	Finance/accounting managers
Comply with defined procedures	All staff

Note: In the case of small industrial units the person responsible can be the owner.

Reviewed by:

(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.2 (2)

Policy Audit Checklist

To: Concerned Manager

Policy No.: _____

1. Policy Statement	YES	NO	Remarks
COMMENTS			
1. Policy statement was made prior to identification of environmental aspects	YES	NO	NO
2. No modification to the policy statement were made	YES	NO	YES
3. Policy statement links to aspects	YES	NO	YES
4. The policy statement is supported with objectives and targets	YES	NO	YES
5. The employees at all levels of the organization are aware of the policy statement (understand and implemented)	YES	NO	YES
6. The policy was made aware by report/display	YES	NO	Display/ Report
7. The policy statement ensures that as a minimum, regulatory and legislation compliance will be achieved (if there is any) as part of objectives and targets	YES	NO	YES
8. The interested parties' requirements are respected	YES	NO	YES
9. The compliance to the policy has resulted in the continual improvement in overall performance and is measurable	YES	NO	YES
10. The policy has resulted in the prevention of pollution by the use of processes/practices/materials or products/reduce or control pollution, which may include recycling, treatment, process changes control mechanisms, efficient use of resources, and materials substitution	YES	NO	YES
11. The policy compliance refers to best available technology where economically viable, cost effective, and judged appropriately	YES	NO	YES
12. Management systems	YES	NO	YES
• Improved definition of responsibilities, management structure, and interfaces	YES	NO	YES
• Better control and dissemination of documentation/information	YES	NO	YES

1. Policy Statement	YES	NO	Remarks
• Process parameters better defined and formalized	YES	NO	YES
• Defined management and operational practices	YES	NO	YES
• Efficiency of corrective/preventive action systems	YES	NO	YES
• Quality of monitoring and measurement information	YES	NO	YES
• Effectiveness of audit and review cycle	YES	NO	YES
13. Training/Communication	YES	NO	YES
• Staff, suppliers, contractors/subcontractors, and customer and public environmental awareness programs	YES	NO	YES
14. Products	YES	NO	YES
• Reduction of material input	YES	NO	YES
• Selection of alternative materials with less significant environmental impacts	YES	NO	YES
• Improved recyclability of products	YES	NO	YES
• The use of less/alternative packaging	YES	NO	YES
• Increased efficiency in distribution/transport	YES	NO	YES
• The design of products to minimize their environmental impacts during production, use, and disposal	YES	NO	YES
15. Processes	YES	NO	YES
• The use of cleaner technologies that are more efficient in resource and material consumption	YES	NO	YES
• The recovery and reuse of materials	YES	NO	YES
• Recyclability waste products	YES	NO	YES
• Reduction of wastes	YES	NO	YES
• Reduction and elimination of polluting releases to the environment	YES	NO	YES
• Prevention of environmental accidents, mitigation of their environmental impacts, and contingency planning	YES	NO	YES
16. Natural resources	YES	NO	YES
• Minimization of resource usage	YES	NO	YES
• Use of renewable energy sources	YES	NO	YES
• Minimization of energy consumption	YES	NO	YES
• Recovery and reuse of energy	YES	NO	YES
17. Raw materials and bought-in goods	YES	NO	YES
• Use renewable materials	YES	NO	YES
• Use recyclable materials	YES	NO	YES
• Pressure suppliers improvement in the manufacture of raw materials	YES	NO	YES
• Preventative measures in transport, storage, and handling	YES	NO	YES

Remarks (if any): _____ Satisfactory _____

Reviewed by: _____
 (EMS Coordinator) Signature Date

cc: General Manager

SOP no.: EMS-4.3

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.3 (1)

Environmental Management System Plan

Copy to: Concerned Responsible

S. No.	TASKS	RESPONSIBILITY	MONTH												REMARKS		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
1	Review of Aspects • Activities • Product • Services		X														Completed
2	Identification of significant aspects		X	X													Completed
3	Development of objectives and targets				X	X											Completed
4	Propose policy							X									Completed
5	Approval of policy							X									Completed
6	EMS Program							X									Completed
7	Evaluation of performance								X								Completed
8	Internal Audit									X							Completed
9	Management Review										X						Completed
10	Preinspection											X					Completed
11	Certification												X				Completed
12	Surveillance Visit													X			Completed

Reviewed by :
(EMS Coordinator)

XYZ
Signature

mm/dd/yyyy
Date

SOP no.: EMS-4.3

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.3 (2)

EMS Certification Plan

Goal No.	Target date	Result Paths								Codes: X = Executes work D = Takes decision solely d = Take decision jointly R = Responsible for progress C = Must be consulted I = Must be informed A = Available to advise	Team Responsibilities								
		Planning	Aspects	Documentation	Metrics	Training	Auditing, checking	Start up	Certification		Team leader	Team member 1	Team member 2	Team member 3	Site manager	Quality manager	All managers	All employees	
1		●								When management support has been obtained, and resources and deliverables agreed	X	I							
2		●								When an initial review of the business has been completed					I	A	I		
3		●								When a milestone plan for the EMS project has been agreed by the project team	d	d	d	d	I	A			
4			●							When the company's environmental aspects have been agreed	d	d	d	d		A			
5			●							When the legal requirements and other constraints have been identified	R								
6			●							When site policy, objectives and targets have been agreed	X	X	X	X	D		I	I	
7				●						When system procedures, work instructions, and controls have been designed and issued	X	X	X	X	C	I			
8					●					When metrics/feedbacks on environmental performance are in place	X	X	X	X	I				
9						●				When the key staff have been trained and all staff are aware of the company's program	R							I	
10							●			When audit program is running	R	I	I	I		I			
11								●		When first management review has taken place	R	I	I	I	X	X	I		
12									●	When the EMS has been checked against the standard	R	I	I	I					
13									●	When the EMS has been checked against the significant aspects	R	I	I	I					
14									●	When the EMS has been checked for loop closure	R	I	I	I					
15									●	When the initial visit by the certifier has taken place	R	I	I	I	I	I			
16									●	When the audit visit has taken place	R	I	I	I	I	I	I		
17									●	When certification has been obtained	R	I	I	I	I	I	I		

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.3

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.3 (3)

Example of Approach to Achieving a Certified EMS

Note: Modify the approach for your company

1. When management support has been obtained and resources agreed	Top management agreement and active support. Resources needed include money, time, and people
2. When the Legal Requirements have been identified	Constrains, including regulatory, insurance, contractual, business requirements, public perceptions, views of other interested parties, etc.
3. When an Initial Review of the business has been completed and when the company's Environmental Aspects have been identified	Rate and rank environmental aspects to identify the most significant. Include potential liabilities from the initial review
4. When a milestone plan for the EMS project has been agreed	Plan project and agree project responsibilities. Identify and obtain support of the project team
5. When Policy, Objectives, and Targets have been agreed	Agree policy, objectives, and targets. Must be relevant to the significant aspects
6. When the Environmental Program has been agreed	Design and agree program. Agree responsibilities. Needs to be simple and easily understood
7. When System Procedures, Work Instructions , and controls have been designed and issued	Design, draft, agree, implement. Documentation should be so clear, easily understood, and as short as possible. Involve employees in writing work instructions. Try to use flow diagrams, not text
8. When metrics/feedbacks on Environmental Performance are in place	Design, implement. Relating metrics to turnover or output will allow benchmarking against other companies
9. When the key staff have been Trained and all staff are Aware of the company's program	Train key staff. Incorporate into existing staff a training program, if appropriate. Implement program of staff briefings to ensure awareness of company staff
10. When the Audit program is running	Design audit protocols and program. Implement. Auditors and audit program must be credible.
11. When the first Management Review has taken place	Implement. Needs to be at least one management review to obtain certification

continued

12. When the EMS has been checked against the standard	Fill in the clause trace table. Fill any missing or incomplete areas
13. When the EMS has been checked against significant aspects	Confirm all significant effects managed
14. When the EMS has been checked for loop closure	Check whether all loops closed, e.g., corrective actions, nonconformances, and communications
15. When the Initial Visit by the certifier has taken place	Incorporate any changes required
16. When the Audit Visit has taken place	Close out any nonconformances
17. When Certification has been obtained	Success

SOP no.: EMS-4.3.1
 Issue date: mm/dd/yyyy
 Revision no.: New

Attachment no: 4.3.1 (1) A

Register of Environmental Impacts

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A1. Waste Water Treatment	ACTIVITY: Recycling	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: N/A		
LOCATION: Waste Water Treatment Plant		AREA Utilities				
ENVIRONMENTAL ASPECT		OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
B1. Controlled and uncontrolled emissions to atmosphere		<ul style="list-style-type: none"> Waste treatment plant design is based on biological degradation, natural principle No controlled and uncontrolled emission are emitted Total amount of waste water treated in year 2000 = 92037 M³ The capacity of WTP can still accommodate 25% more 		—	<ul style="list-style-type: none"> Pollution prevention 	PI-001

SOURCE: A1. Waste Water Treatment	ACTIVITY: Recycling	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: N/A	
LOCATION: Waste Water Treatment Plant		AREA Utilities			
ENVIRONMENTAL ASPECT	OTHER INFORMATION	IMPACT -VE	IMPACT +VE	IMPACT CODE	
C1. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> The distribution of water after treatment is controlled and used only for irrigation The water quality is suitable for irrigation Capacity 500 m³/day At present the plant is working at 70% of its capacity and can accommodated 25% more 	—	<ul style="list-style-type: none"> Marine water conservation Marine flora and fauna conservation 	PI-002 PI-003	
D1. Contamination of land	<ul style="list-style-type: none"> The waste water treatment process does not involve land contamination 	—	<ul style="list-style-type: none"> Marine water preservation Natural flora and fauna conservation Preservation of land 	PI-002 PI-004 PI-005	
E1. Solid Waste	<p>The following solid waste results from process:</p> <ul style="list-style-type: none"> Carton boxes, insignificant Sludge is handed over to local municipality for safe disposal—50,000 gallons/year 	—	<ul style="list-style-type: none"> Health & safety Pollution prevention 	PI-006 PI-001	
F1. Use of raw materials and other natural resources	<ul style="list-style-type: none"> Catalyst is used for biological degradation and the quantities are insignificant 	—	<ul style="list-style-type: none"> No impact 	PI-007	
G1. Use of energy	<ul style="list-style-type: none"> Energy is resourced from RAK electricity department Electrical energy consumption is insignificant and the system is operated only if sufficient effluent is to be treated 	<ul style="list-style-type: none"> Natural resource utilization 	<ul style="list-style-type: none"> No impact 	PI-007	
H1. Use of water	<ul style="list-style-type: none"> The waste water is 90% recycled for irrigation water 	—	<ul style="list-style-type: none"> Good housekeeping, irrigation around the plant 	PI-008	
I1. Noise, odour, dusts, vibration and visual impact	<ul style="list-style-type: none"> The process is controlled No significant odour is produced It is an open space operation 	—	<ul style="list-style-type: none"> No impact Pollution prevention 	PI-007 PI-001	
J1. Effects on ecosystems	<ul style="list-style-type: none"> The overall system is satisfactory (under control) and does lead to major or minor impact on ecosystem 	—	<ul style="list-style-type: none"> Preservation of natural flora and fauna 	PI-110	

K1. Upstream effects—energy, water, and raw materials	<ul style="list-style-type: none"> The plantation helps in maintaining the ecosystem 	—	<ul style="list-style-type: none"> Promotes flora and fauna Good housekeeping Helps promote wildlife preservations and birds 	PI-110 PI-008 PI-111
L1. Downstream effects	<ul style="list-style-type: none"> Irrigation 	—	—	—
M1. Past effects	<ul style="list-style-type: none"> Discharge of waste water to municipality drainage system 	<ul style="list-style-type: none"> Marine water contamination 	—	NI-001
N1. Future effects	<ul style="list-style-type: none"> Maintain ecosystem 	—	<ul style="list-style-type: none"> Marine water conservation Pollution prevention 	PI-002 PI-001
O1. Selection test	<ul style="list-style-type: none"> N/A 	—	—	—
P1. Environmental impact evaluation	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	—	—
Q1. Identification of level of significance	<ul style="list-style-type: none"> As follows 	<ul style="list-style-type: none"> As follows 	—	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects Under Normal Operation Conditions														
Elements	Conditions / Score						Weighting Factor			Remarks				
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total		
Legislation	Existing Local legislation No. 16 Personal protection equipment Local information bulletin, Appendix 1, 1.1 Regulation on the re-use and land disposal of water and sludge. 1.2 Regulation on the disposal of waste water into marine environment. Local official information Appendix 1 1.3 Regulation on air pollution control from stationary sources 1.4 Occupational health & safety regulation 1.5 Protected areas regulations	3	Impending			3	None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental		No detrimental None	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Local legislation	3	Moderate interest		Little interest		No interest	0	3×	2	6	<i>c</i>		
Quantity	High		Medium		Low		Nil None	0	0×	3	0	<i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	12		

B: Ranking of Environmental Effect Under Other Operating Conditions														
Elements	Conditions / Score									Total		Remarks		
	Condition	12	Condition	6	Condition	3	Condition	0						
Abnormal operations	—		Increased environmental impact —		No Change • Not known	3	Reduced environmental impact		3	a				
Accident / emergency			Increased environmental impact • Accidental overflow of holding tank	6	No change		Reduced environmental impact		6	b				
Past activities	Evident/requires action —		Possible damage/difficult to evaluate • Drained in sewage system • Marine pollution	6	—		No damage	0	6	c				
Planned activities			Increased environmental impact		No change		Reduced environmental impact • Maintenance of waste water treatment plant.	0	0	d				
Other Operating Conditions Total Score = (a + b + c + d)									Total B		15			
C: Cost Factor Ranking of Environmental Effects														
Elements	Very high	4	High	3	Medium	2	Low	1	None	0	Total	Remarks		
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0			
Estimated	N/A		N/A		N/A		N/A		N/A		0			
Cost Factor Total C											0			
FINAL SCORE: = A + B + C											Identification Level of Significance		27	

Reviewed by:
(EMS Coordinator)

Signature

Date

EMS no.: 4.3.1
 Issue date: mm/dd/yyyy
 Revision no.: New
 Initiator signature

Attachment no. 4.3.1 (1) B

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A2. Steam Generation/ Boilers (Light Diesel Oil)	ACTIVITY: Steam Generation	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: Steam Generation		
LOCATION: Boiler Plant	AREA: Boiler Room					
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE	
B2. Controlled and uncontrolled emissions to atmosphere	<ul style="list-style-type: none"> • Currently, four boilers are in operation; load is 5 ts/h • Two boilers are used for plant I steam generations operations and they meet the EU standard for environmental compliance • Two old boilers purchased in 1982 are old and have high expenses in fuel bills. These two boilers will be replaced by a new one of EU environmental compliance to reduce emissions • Light diesel oil boilers are used; capacity is 5 t steam/h • The emissions are controlled, and monitoring of CO₂, CO, and temperature is carried out 		<ul style="list-style-type: none"> • Global warming • CO₂ and CO emissions • Air pollution/soot 	—	<ul style="list-style-type: none"> • NI-002 • NI-003 • NI-004 	

	<ul style="list-style-type: none"> • Light diesel oil is used, which is of good quality • Approximate consumption is 10,000 gallons/month • The boilers are of compact type • CO₂ and CO are produced in insignificant quantities • The process does not involve compression so nitrogenous compounds are not emitted. 			
C2. Controlled and uncontrolled discharges to water	—	—	• Marine water preservation	PI-002
D2. Contamination of land	• Light diesel storage tanks are bunded	—	• Preservation of land	PI-005
E2. Solid waste	• Solid waste is oil used in pumps, handed over to service stations for safe disposal	—	• Pollution prevention	PI-001
F2. Use of raw materials and other natural resources	• Light diesel oil	<ul style="list-style-type: none"> • Global warming • Consumption of natural resources 	—	NI-002 NI-005
G2. Use of energy	• Electrical consumption is insignificant	Natural resource utilization	• No impact	PI-007
H2. Use of water	• 90% of water used is recovered through condensation, only 10% is the loss, which is insignificant.	—	• No impact	PI-007
I2. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> • The overall process is self-contained. No dust is produced. • The noise due to boilers operations is slightly high; staff is provided with ear protection • Boiler operation generates smoke (dust) that is monitored and controlled by boiler tuning and maintenance, insignificant impact 	—	• No impact	PI-007
J2. Effects on ecosystems	• The overall system is satisfactory (under control) and does not lead direct threat to the ecosystem	• Global warming	—	NI-002
K2. Upstream effects—energy, water, and raw materials	• Reduced emission of CO ₂ and CO level, through adequate monitoring	—	• Pollution prevention	PI-001
L2. Downstream effects	• Reduced emission of CO ₂ and CO	—	• Reduced global warming	PI-111

SOURCE: A2. Steam Generation/ Boilers (Light Diesel Oil)	ACTIVITY: Steam Generation	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: Steam Generation		
LOCATION: Boiler Plant	AREA: Boiler Room					
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE	
M2. Past effects	• Increased emission of CO ₂ and CO		• Air pollution	—	NI-004	
N2. Future effects	• Reduced emission of CO ₂ and CO		—	• Pollution prevention	PI-001	
O2. Selection test	• N/A		• N/A	—	—	
P2. Environmental impact evaluation	• As above		• As above	—	—	
Q2. Identification of level of significance	• As follows		• As follows	—	—	

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects Under Normal Operation Conditions														
Elements	Conditions/Score						Weighting Factor			Remarks				
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total		
Legislation	Existing Local official legislation No. 16: Personal protection equipment No. 40: Examination and certification of boilers and pressure vessels. No. 57: Bunding of storage tanks and transfer facilities Local official information bulletin, Appendix 1, 1.2 Regulation on air pollution control from stationary sources 1.2 Occupational health & safety regulation		Impending				None	3	3	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental • Temporary increase of CO ₂ and CO level	2	Limited detrimental		No detrimental	0	2x	3	6	<i>b</i>		
Interested parties	Considerable interest local municipality	3	Moderate interest		Little interest		No interest None	0	3x	2	6	<i>c</i>		
Quantity	High 10,000 gallons/month	3	Medium		Low	1 1	Nil		3x	3	9	<i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	27		

B: Ranking of Environmental Effect Under Other Operating Conditions											
Elements	Conditions/Score									Remarks	
	Condition	12	Condition	6	Condition	3	Condition	0	Total		
Abnormal operations	—		Increased environmental impact • No monitoring and control of CO ₂ and CO	6	No change		Reduced environmental impact	3	6	<i>a</i>	
Accident / emergency			Increased environmental impact		No change • Only possible if storage vessel leaks due to natural disaster, e.g., earthquake	3	Reduced environmental impact	3	3	<i>b</i>	
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate —	6	—		No damage	0	6	<i>c</i>	
Planned activities			Increased environmental impact		No change	3	Reduced environmental impact • Planned activity reduces environmental impact	3	3	<i>d</i>	
Other Operating Conditions Total Score = (a + b + c + d)								Total B		18	

C: Cost Factor Ranking of Environmental Effects													
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0		
Estimated	N/A 1.5 million US\$		N/A		N/A		N/A		N/A		0		
Cost Factor	Total C										0		
FINAL SCORE: = A + B + C											Identification Level of Significance	45	

Remarks: Action program required for the replacement of old boilers to control emissions

Reviewed by:
(EMS Coordinator)

Signature

Date

EMS no.: 4.3.1
 Issue date: mm/dd/yyyy
 Revision no.: New
 Initiator signature

Attachment no. 4.3.1 (1) C

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A3. Burning of Diesel (Electricity Generation)	ACTIVITY: Power Generation	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: Electricity Generation		
LOCATION: Generator Plant	AREA: Plant I, II, III, & Administration, Housing					
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE	
B3. Controlled and uncontrolled emissions to atmosphere	<ul style="list-style-type: none"> • There are six standby generators • Only used when power fails • Industrial quality diesel is used • Operational hours variable • The emission are controlled by efficient maintenance, which is insignificant • Annual competition of diesel \cong 600 gallons • Uncontrolled emissions are CO₂, CO, and nitrogen compounds • Not monitored 		<ul style="list-style-type: none"> • Health & safety • Global warming • Smog 	—	<ul style="list-style-type: none"> • NI-006 • NI-002 • NI-006 	

C3. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> • Mobile oil discarded is handed over to the local municipality for safe disposal 	—	<ul style="list-style-type: none"> • Marine water conservation 	PI-002
D3. Contamination of land	<ul style="list-style-type: none"> • 1800 L mobile oil is drained and transferred to local municipality for disposal at the time of maintenance every year 	—	<ul style="list-style-type: none"> • Preservation of land 	PI-005
E3. Solid waste	<ul style="list-style-type: none"> • Air filters, insignificant quantity sold to contractors 	—	<ul style="list-style-type: none"> • No impact 	PI-007
F3. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Diesel is stored in closed tanks banded 	—	<ul style="list-style-type: none"> • Pollution prevention 	PI-001
G3. Use of energy	<ul style="list-style-type: none"> • Diesel is used to product energy 	<ul style="list-style-type: none"> • Global warning • Smog 	—	NI-002 NI-006
H3. Use of water	<ul style="list-style-type: none"> • Water is used in radiators, insignificant quantities 	—	<ul style="list-style-type: none"> • No impact 	PI-007
I3. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> • Creates noise; staff use ear protection, since it is away from the administration block, noise is insignificant • Vibration is localized; does not effect environment, insignificant • Smoke dust, insignificant 	—	<ul style="list-style-type: none"> • No impact • No impact • No impact 	PI-007 PI-007 PI-007
J3. Effects on ecosystems	<ul style="list-style-type: none"> • Generates CO₂, CO, and nitrogen compounds 	<ul style="list-style-type: none"> • Health & safety • Global warning 	—	NI-006 NI-002
K3. Upstream effects—energy, water, and raw materials	<ul style="list-style-type: none"> • Variable 	<ul style="list-style-type: none"> • Global warming • Health & safety 	—	NI-002 NI-006
L3. Downstream effects	<ul style="list-style-type: none"> • Variable 	<ul style="list-style-type: none"> • Global warming • Health & safety 	—	NI-002 NI-006
M3. Past effects	<ul style="list-style-type: none"> • Uncontrolled emissions 	<ul style="list-style-type: none"> • Global warming • Air pollution • Health & safety 	—	NI-002 NI-004 NI-006
N3. Future effects	<ul style="list-style-type: none"> • Insignificant 	—	<ul style="list-style-type: none"> • Pollution prevention • Health & safety 	PI-001 PI-113

SOURCE: A3. Burning of Diesel (Electricity Generation)	ACTIVITY: Power Generation	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: Electricity Generation		
LOCATION: Generator Plant	AREA: Plant I, II, III, & Administration, Housing					
ENVIRONMENTAL ASPECT	OTHER INFORMATION			IMPACT -VE	IMPACT +VE	IMPACT CODE
O3. Selection test	• N/A			• N/A	—	—
P3. Environmental impact evaluation	• As above			• As above	—	—
Q3. Identification of level of significance	• As follows			• As follows	—	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects Under Normal Operation Conditions													
Elements	Conditions/Score						Weighting Factor			Remarks			
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total	
Legislation	Existing Local official legislation No. 16 Personal protection equipment Local official information bulletin, Appendix 1 1.1 Regulation on air pollution control from stationary sources 1.2 Occupational health & safety regulation 1.3 Noise control regulation Local official legislation No. 5: Oil spill response No. 10: Guarding of dangerous machinery No. 29: Request for the discharge of waste gases, fumes, & dust to atmosphere	3	Impending				None		3x	2	6 <i>a</i>		
Environmental damage	Known detrimental • Global warming • Air pollution • Health & safety	3	Possible detrimental		Limited detrimental		No detrimental		3x	3	9 <i>b</i>		
Interested parties	Considerable interest Local municipality	3	Moderate interest		Little interest		No interest		3x	2	6 <i>c</i>		
Quantity	High		Medium		Low	1	Nil	0	1x	3	3 <i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	24	

B: Ranking of Environmental Effect Under Other Operating Conditions												
Elements	Conditions/Score								Total		Remarks	
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations			Increased environmental impact • No control over the emission	6	No change		Reduced environmental impact		6	<i>a</i>		
Accident/emergency			Increased environmental impact • Accidental fire in reserve diesel	6	No change		Reduced environmental impact		6	<i>b</i>		
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate	6	• Emission of toxic gases	3	No damage • No diverse events reports		3	<i>c</i>		
Planned activities			Increased environmental impact		No change	3	Reduced environmental impact • Reduced level of emission due to planned maintenance	0	0	<i>d</i>		
Other Operating Conditions Total Score = (a + b + c + d)									Total B	15		

C: Cost Factor Ranking of Environmental Effects														
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks		
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0			
Estimated	N/A		Applicable <1,00,000 US\$	3	N/A		N/A		N/A		3			
Cost Factor	Total C											3		
FINAL SCORE: = A + B + C										Identification Level of Significance			42	

Remarks: Action program required to procure equipment for the monitoring of emission due burning of diesel (monitoring of CO, CO₂, and nitrogen compounds injurious to health)

Reviewed by:
(EMS Coordinator)

Signature

Date

Attachment no. 4.3.1 (1) D

Environmental Aspect Significance Evaluation Matrix

Prepared By: Concerned Manager

SOURCE: A4. HVAC System CFCs	ACTIVITY: Cooling	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES ES: Air Conditioning			
LOCATION: Technical Floor Plant I, II, III, & Administration		AREA: Plant I, II, III, & Administration Offices					
ENVIRONMENTAL ASPECT	OTHER INFORMATION			IMPACT -VE	IMPACT +VE	IMPACT CODE	
B4. Controlled and uncontrolled emissions to atmosphere	<ul style="list-style-type: none"> The existing system is comprised of old and new refrigeration and air conditioning equipment As per company policy and local official legislation—after 1996 all new purchases are in compliance with the provisions of local legislation. As new imports after 1996 do not permit nonenvironmental-friendly gases in the cooling systems Only few old refrigerators are filled with CFCs Regular maintenance ensures that they are not leaked 			<ul style="list-style-type: none"> Health & safety Ozone depletion 	—	NI-006 NI-007	

	<ul style="list-style-type: none"> • New equipments purchased; it is ensured they do not contain CFCs 11, 12, 113, 114, 115, and halogenated CFCs • New equipments are free from R13a and mostly contain R11&R22 which is a better choice • New equipments are free from ammonia • Gas is refilled in-house through recycling procedure where possible • The venting of controlled refrigerant is not permitted during maintenance • The yearly purchase of gases is insignificant and amounts only to approximately in kilograms 			
C4. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> • At the time of HVAC system maintenance, the water is drained from the chillers but recycled through waste treatment plant The maintenance is once in a year 	—	<ul style="list-style-type: none"> • Irrigation 	PI-008
D4. Contamination of land	<ul style="list-style-type: none"> • Oil changed from the chillers at the time of maintenance is insignificant ≈ 50 gallons • Disposal of oil is managed by handing over to service stations for disposal through local municipality 	—	<ul style="list-style-type: none"> • Land preservation • Marine water preservation 	PI-005 PI-002
E4. Solid waste	<ul style="list-style-type: none"> • Old AC metal ductings are reused for small projects • AC filters are reused where possible or sold to recyclers • Oil from the chillers is handed over to service stations for disposal by local municipality 	—	<ul style="list-style-type: none"> • Pollution prevention 	PI-001
F4. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Gases R13a and R11 are used for refilling • Purchased quantities of gases are insignificant for the HVAC system 	—	<ul style="list-style-type: none"> • Reduction in ozone depletion 	PI-010
G4. Use of energy	<ul style="list-style-type: none"> • High energy consumption • An energy management system is installed to monitor energy consumption • Energy consumption is optimized by schedule maintenance and temperature control • Energy saving models to be installed to reduce energy consumption 	<ul style="list-style-type: none"> • High energy consumption 	—	NI-008

SOURCE: A4. HVAC System CFCs	ACTIVITY: Cooling	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES ES: Air Conditioning		
LOCATION: Technical Floor Plant I, II, III, & Administration		AREA: Plant I, II, III, & Administration Offices				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE	
H4. Use of water	<ul style="list-style-type: none"> Significant amount of water is used in a closed-loop system in chillers—28,000 gallons; however, at the time of maintenance it is recycled 		—	<ul style="list-style-type: none"> Water recycling Irrigation 	PI-009 PI-008	
I4. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> Vibration and noise insignificant. The equipment is installed in a separate area, called technical area 		—	<ul style="list-style-type: none"> No impact 	PI-007	
J4. Effects on ecosystems	<ul style="list-style-type: none"> The overall effect will be ozone reduction 		<ul style="list-style-type: none"> Ozone depletion Health & safety 	—	NI-007 NI-006	
K4. Upstream effects—energy, water, and raw materials	<ul style="list-style-type: none"> Reduction in use of CFCs 		—	<ul style="list-style-type: none"> Health & safety Ozone restoration 	PI-006 PI-112	
L4. Downstream effects	<ul style="list-style-type: none"> Operation control on CFCs 		—	<ul style="list-style-type: none"> Ozone restoration 	PI-112	
M4. Past effects	<ul style="list-style-type: none"> Excessive use of CFCs 		<ul style="list-style-type: none"> Ozone depletion 	—	NI-007	
N4. Future effects	<ul style="list-style-type: none"> Replacement of CFCs by using ozone-friendly gases 		—	<ul style="list-style-type: none"> Ozone conservation Health & safety 	PI-112 PI-113	
O4. Selection test	N/A		<ul style="list-style-type: none"> N/A 	—	—	
P4 Environmental impact evaluation	As above		<ul style="list-style-type: none"> N/A 	—	—	
Q4. Identification of level of significance	As follows		<ul style="list-style-type: none"> As follows 	—	—	

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects Under Normal Operation Conditions													
Elements	Conditions/Score							Weighting Factor			Remarks		
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply	Factor		Total	
Legislation	Existing Local legislation No. 16 Personal Protection Equipment Local information on Appendix 1 1.1 Regulation on air pollution control from stationary sources 1.2 Occupational health & safety regulation Environmental protection & safety Guidelines. No. 29: Requirements for the discharge of waste gases fumes and dust to the atmosphere. No. 20: Personal protective equipment No. 58: Policy on the control of ozone deleting substances.	3	Impending				None		3x	2	6 <i>a</i>		
Environmental damage	Known detrimental	1	Possible detrimental		Limited detrimental • Continuous use of CFCs may cause limited reduction of ozone layer	1	No detrimental		1x	3	3 <i>b</i>		
Interested parties	Considerable interest Local legislation	3	Moderate interest		Little interest		No interest		3x	2	6 <i>c</i>		
Quantity	High		Medium		Low • Very few old equipment • Release CFCs	1 1	Nil	0	1x	3	3 <i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	18	

B: Ranking of Environmental Effect Under Other Operating Conditions												
Elements	Conditions/Score								Total		Remarks	
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations	—		Increased environmental impact <ul style="list-style-type: none"> • Venting of CFCs at the time of maintenance 	6	No change	3	Reduced environmental impact	0	6	<i>a</i>		
Accident / emergency			Increased environmental impact <ul style="list-style-type: none"> • Only possible if there is a natural disaster, e.g., earthquake and gas kit leakage 	6	No change	3	Reduced environmental impact	0	6	<i>b</i>		
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate <ul style="list-style-type: none"> • Before 1996, the old systems were based on CFCs • Ozone depletion 	6	—		No damage	0	6	<i>c</i>		
Planned activities			Increased environmental impact		No change	3	Reduced environmental impact <ul style="list-style-type: none"> • Planned maintenance and programs will reduce the impact 	3	3	<i>d</i>		
Other Operating Conditions Total Score = (a + b + c + d)									Total B		21	

C: Cost Factor Ranking of Environmental Effects													
Elements	Very high	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost	<1,000,000 US\$		<1,00.000 US\$		<50,000 US\$		<10,000 US\$				0		
Estimated	N/A		<1,00.000	3			N/A		N/A		3		
Cost Factor	Total C										3		
FINAL SCORE: = A + B + C											Identification Level of Significance	42	

Remarks: Action program required to replace equipment with CFCs and ensure further decrease in emission of R11 and R12.

Reviewed by:
(EMS Coordinator)

Signature

Date

EMS no.: 4.3.1

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Initiator signature

Attachment no. 4.3.1 (1) E

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A5. Plastics Dosing Cups Manufacturing Plant	ACTIVITY: Manufacturing	DATE: mm/dd/yyyy	PRODUCT: Plastics Dosing Cups	SERVICES: Plastics Dosing Cups Manufacturing		
LOCATION: Near the Administration Block	AREA: Plastics Dosing Cups Manufacturing Plant					
ENVIRONMENTAL ASPECT	OTHER INFORMATION			IMPACT -VE	IMPACT +VE	IMPACT CODE
B5. Controlled and uncontrolled emissions to atmosphere	<ul style="list-style-type: none"> • Only accidental fire may happen • Plastic resin is purchased and stored in a secured store • The dosing cups are provided with syrups and suspensions • High-density polyethylene and low-density polyethylene are used as a raw material which is food grade nonharmful • Storage of material 			—	<ul style="list-style-type: none"> • No impact • Air pollution prevention 	PI-007 PI-001
C5. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> • N/A 			—	<ul style="list-style-type: none"> • Marine water prevention 	PI-002

D5. Contamination of land	<ul style="list-style-type: none"> • N/A 	—	<ul style="list-style-type: none"> • Land preservation 	PI-005
E5. Solid waste	<p>The following solid waste results from plastic dosing cups manufacturing process</p> <ul style="list-style-type: none"> • Discarded dosing cups, paper bag, and shrink-wrap plastic 	—	—	—
F5. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Materials used are converted into finished products • Process losses are NIL 	—	<ul style="list-style-type: none"> • Resource optimization 	PI-113
G5. Use of energy	<ul style="list-style-type: none"> • Energy is resourced from local electricity department, insignificant 	<ul style="list-style-type: none"> • Natural resource utilization 	<ul style="list-style-type: none"> • No impact 	PI-007
H5. Use of water	<ul style="list-style-type: none"> • N/A 	—	<ul style="list-style-type: none"> • No impact 	PI-007
I5. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> • The overall plastic dosing cups process is self-contained. No dust is produced • The packaging process is noisy but within 90 db., which is satisfactory 	—	—	—
J5. Effects on ecosystems	<ul style="list-style-type: none"> • The overall system is satisfactory (under control) and does not lead to major threats to the economic system 	—	<ul style="list-style-type: none"> • No impact 	PI-007
K5. Upstream effects—energy, water, and raw materials	<ul style="list-style-type: none"> • The dosing cups in circulation in public should dispose for recyclers 	<ul style="list-style-type: none"> • Waste generation 	—	NI-009
L5. Downstream effects	<ul style="list-style-type: none"> • The dosing cups in circulation in public should dispose for recyclers 	<ul style="list-style-type: none"> • Waste generation 	—	NI-009
M5. Past effects	<ul style="list-style-type: none"> • The dosing cups in circulation in public should dispose for recyclers 	<ul style="list-style-type: none"> • Waste generation 	—	NI-009
N5. Future effects	<ul style="list-style-type: none"> • The dosing cups in circulation in public should dispose for recyclers 	<ul style="list-style-type: none"> • Waste generation 	—	NI-009
O5. Selection test	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	—
P5. Environmental impact evaluation	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	—
Q5. Identification of level of significance	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects Under Normal Operation Conditions														
Elements	Conditions/Score						Weighting Factor			Remarks				
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total		
Legislation	Existing Local official legislation No. 16 Personal Protection Equipment Local official information on Appendix 1 1.1 Regulation on air pollution control from stationary sources 1.2 Occupational health & safety regulation 1.3 Noise control regulation		Impending				None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental • Waste generation dust • Air pollution • Metal sheet	1	No detrimental		1×	3	3	<i>b</i>		
Interested parties	Considerable interest • Staff awareness and safety • Local legislation	3	Moderate interest		Little interest		No interest		3×	2	6	<i>c</i>		
Quantity	High		Medium		Low	1	Nil Insignificant waste		×	3		<i>d</i>		
Normal operating conditions total = (a + b + c + d)											Total A	15		

B: Ranking of Environmental Effect under other Operating Conditions													
Elements	Conditions/Score									Total		Remarks	
	Condition	12	Condition	6	Condition	3	Condition	0					
Abnormal operations	—		Increased environmental impact • Not using mask may lead to health & safety after long exposure to metal dust		No Change	3	Reduced environmental impact	0	6	a			
Accident / emergency			Increased environmental impact • Accidental fire (resin) • Adequate fire fighting system available	6	No change	3	Reduced environmental impact	0	6	b			
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate -		—		No damage	0	0	c			
Planned activities			Increased environmental impact		No change		Reduced environmental impact • Planned activities reduce aluminum waste	0	0	d			
Other operating conditions total score = (a + b + c + d)									Total B		12		
C: Cost Factor Ranking of Environmental Effects													
Elements	Very high	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0		
Estimated	N/A		N/A		N/A		Applicable <10,000 US\$	1	N/A		1		
Cost Factor	Total C										1		
FINAL SCORE: = A + B + C										Identification Level of Significance		28	

Remarks: Action program required to increase public awareness to promote pollution preventive and encourage recycling

Reviewed by:
(EMS Coordinator)

Signature

Date

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 Initiator signature

Attachment no. 4.3.1 (1) F

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A6. Aluminum Caps Manufacturing Plant	ACTIVITY: Manufacturing	DATE: mm/dd/yyyy	PRODUCT: Aluminum Caps	SERVICES: Aluminum Caps Manufacturing		
LOCATION: Near the administration block	AREA: Aluminum caps manufacturing plant					
ENVIRONMENTAL ASPECT	OTHER INFORMATION			IMPACT -VE	IMPACT +VE	IMPACT CODE
B6. Controlled and uncontrolled emissions to atmosphere	• The process does not lead to controlled or uncontrolled emission to atmosphere			—	• No impact • Air pollution prevention	PI-007 PI-001
C6. Controlled and uncontrolled discharges to water	• None			—	• Marine water conservation	PI-002
D6. Contamination of land	• None			—	• Land conservation	PI-005

E6. Solid waste	<p>The following solid waste results from the process</p> <ul style="list-style-type: none"> • Rejected aluminum caps • Waste aluminum sheets • Aluminum dust <p>Above materials are sold to local buyers and contractors for recycling</p>	—	—	—
F6. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Materials used are converted into finished products • Losses are insignificant 	<ul style="list-style-type: none"> • Resources utilization 	—	NI-010
G6. Use of energy	<ul style="list-style-type: none"> • Energy is resourced from local electricity department, insignificant savings are achieved by planned activities 	<ul style="list-style-type: none"> • Natural resource utilization 	<ul style="list-style-type: none"> • Energy conservation 	PI-112
H6. Use of water	<ul style="list-style-type: none"> • N/A 	—	<ul style="list-style-type: none"> • No impact 	PI-007
I6. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> • The overall process is self-contained. No significant dust is produced • The process is noisy; staff use hearing protection & safety mask 	<ul style="list-style-type: none"> • Health & safety 	—	NI-006
J6. Effects on ecosystems	<ul style="list-style-type: none"> • The overall system is satisfactory (under control) and does not lead to major threats to the ecology 	<ul style="list-style-type: none"> • Consumption of natural resources 	—	NI-010
K6. Upstream effects—energy, water, and raw materials	<ul style="list-style-type: none"> • Aluminum shortage, consumption of reserves 	<ul style="list-style-type: none"> • Consumption of natural resources 	—	NI-010
L6. Downstream effects	<ul style="list-style-type: none"> • Aluminum waste generation 	—	<ul style="list-style-type: none"> • Increased recycling 	PI-009
M6. Past effects	<ul style="list-style-type: none"> • Aluminum waste generation 	—	—	—
N6. Future effects	<ul style="list-style-type: none"> • Aluminum waste generation 	—	—	—
O6. Selection test	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	—
P6. Environmental impact evaluation	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	—
Q6. Identification of level of significance	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score						Weighting Factor			Remarks				
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total		
Legislation	Existing Local legislation No. 16 Personal Protection Equipment Local official information on Appendix 1 1.1 Regulation on air pollution control from stationary sources 1.2 Occupational health & safety regulation 1.3 Noise control regulation Local Guidelines No. 52: Metal finishing industries		Impending				None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental		No detrimental None	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Personnel safety • Local legislation	3	Moderate interest		Little interest		No interest	0	3×	2	6	<i>c</i>		
Quantity	High		Medium		Low	1	Nil • Nonquantifiable	0	0×	3	0	<i>d</i>		
Normal operating conditions total = (a + b + c + d)											Total A		12	

B: Ranking of Environmental Effect under other Operating Conditions												
Elements	Conditions/Score									Total		Remarks
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations	—		Increased environmental impact —		No change • Not known	3	Reduced environmental impact		3		<i>a</i>	
Accident/emergency			Increased environmental impact • Accidental cuts due to unsafe handling health & safety	6	No change	3	Reduced environmental impact		6		<i>b</i>	
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate —		—		No damage • Not known	0	0		<i>c</i>	
Planned activities			Increased environmental impact		No change	3	Reduced environmental impact • Planned activities will reduce health & safety impact	0	0		<i>d</i>	
Other Operating Conditions Total Score = (a + b + c + d) Total B									9			
C: Cost Factor Ranking of Environmental Effects												
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks
Cost	<1,000,000 US\$		<1,000,000 US\$		<50,000 US\$		<10,000 US\$				0	
Estimated	N/A		N/A		N/A		Applicable <10,000 US\$	1	N/A		1	
Cost Factor Total C											1	
FINAL SCORE: = A + B + C Identification Level of Significance											22	

Remarks: Action program required to increase public awareness for safe disposal and encourage recycling

Reviewed by:
(EMS Coordinator)

Signature

Date

EMS no.: 4.3.1
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 Initiator signature

Attachment no. 4.3.1 (1) G

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A7. Transportation	ACTIVITY: Shipping	DATE: mm/dd/yyyy	PRODUCT: All Products	SERVICES: N/A	
LOCATION	AREA: Inside and Outside				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
B7. Controlled and uncontrolled Emissions to atmosphere	<ul style="list-style-type: none"> • Use of diesel in transportation trucks • Exhaust, emission, exhaust leaks • Particulate in air • Nitrogen oxides • The vehicles are subject to regular maintenance to achieve max. efficiency • All vehicles are inspected for exhaust emission yearly at the time of registration by local traffic police • Daily servicing checks are performed to reduce fuel consumption 		<ul style="list-style-type: none"> • Health & safety • Acid rain • Global warming • Smoke 	—	NI-006 NI-112 NI-002 NI-006

	<ul style="list-style-type: none"> • Training of drivers is conducted to ensure reduction in fuel consumption • Planning & organized vehicles movement inside and outside 			
C7. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> • The oil is only replaced at service station and disposed of through local municipality or concerned station 	—	<ul style="list-style-type: none"> • Marine water conservation 	PI-002
D7. Contamination of land	<ul style="list-style-type: none"> • The vehicles are inspected on continuous basis for leakages of oil which is insignificant 	—	<ul style="list-style-type: none"> • Conservation of natural flora and fauna • Preservation of land 	PI-004 PI-005
E7. Solid waste	<p>Following solid waste results from the vehicles</p> <ul style="list-style-type: none"> • Used batteries • Batteries are handed over to local municipality for safe disposal • Engine oil handed over to gas station 	—	<ul style="list-style-type: none"> • Pollution prevention • Health & safety 	PI-001 PI-006
F7. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Diesel, petrol, and engine oil 	<ul style="list-style-type: none"> • Resource utilization 	—	NI-111
G7. Use of energy	<ul style="list-style-type: none"> • Use of energy is insignificant 	<ul style="list-style-type: none"> • Natural resource utilization 	<ul style="list-style-type: none"> • Energy conservation 	PI-112
H7. Use of water	<ul style="list-style-type: none"> • Insignificant amount of water is used in radiators 	—	<ul style="list-style-type: none"> • No impact 	PI-007
I7. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> • The transportation process is noisy but insignificant • Odor is kept insignificant through servicing 	—	<ul style="list-style-type: none"> • Health & safety • Pollution prevention 	PI-113 PI-001
J7. Effects on ecosystems	<ul style="list-style-type: none"> • Inadequate organization may result in adverse effect 	<ul style="list-style-type: none"> • Deterioration of ecosystem 	—	NI-112

SOURCE: A7. Transportation	ACTIVITY: Shipping	DATE: mm/dd/yyyy	PRODUCT: All Products	SERVICES: N/A	
LOCATION	AREA: Inside and Outside				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
K7. Upstream effects—energy, water, raw materials	• Natural product utilization, unorganized upstream effects may result in -ve impacts		• Resources utilization • Threat to health & safety • Energy	—	NI-010 NI-006 NI-113
L7. Downstream effects	• Natural product utilization		• Health & safety	—	NI-005
M7. Past effects	• Lack of maintenance and services		• Health & safety	—	NI-006
N7. Future effects	• Reduce air pollution		—	• Health & safety • Pollution prevention	PI-113 PI-001
O7. Selection test	• N/A		• N/A	—	—
P7. Environmental impact evaluation	• As above		• As above	—	—
Q7. Identification of level of significance	• As follows		• As follows	—	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score							Weighting Factor			Remarks			
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply	Factor		Total		
Legislation	Existing Local legislation No. 16 Personal Protection Equipment Local official information bulletin. Appendix 1, 1.1 Regulation on air pollution control from stationary sources Local legislations No. 5: Oil spill response & preparation No. 29: Requirements for the discharge of waste gases, fumes and dust to atmosphere. 1.2 Noise control regulation	3	Impending				None		×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental • Ozone depletion • Air pollution • Health & safety		Limited detrimental		No detrimental None	0	2	3	6	<i>b</i>		
Interested parties	Considerable interest • Local legislation • Health & Safety	3	Moderate interest		Little interest		No interest		3×	2	6	<i>c</i>		
Quantity	High	3	Medium		Low	1 1	Nil Nil (not quantifiable)	0	0×	3	0	<i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	18		

B: Ranking of Environmental Effect under other Operating Conditions													
Elements	Conditions/Score										Total		Remarks
	Condition	12	Condition	6	Condition	3	Condition	0					
Abnormal operations	—		Increased environmental impact • No routine service	6	No Change		Reduced environmental impact		6	<i>a</i>			
Accident / emergency			Increased environmental impact • Accidental fire may lead to air pollution	6	No change		Reduced environmental impact		6	<i>b</i>			
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate		• Lack of service and planned operations	3	No damage		3	<i>c</i>			
Planned activities			Increased environmental impact		No change	3	Reduced environmental impact • Planned service & maintenance & organization	0	0	<i>d</i>			
Other Operating Conditions Total Score = (a + b + c + d) Total B									15				
C: Cost Factor Ranking of Environmental Effects													
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0		
Estimated	N/A		N/A		N/A		N/A		N/A		0		
Cost Factor Total C											0		
FINAL SCORE: = A + B + C Identification Level of Significance											33		

Remarks: Action program required to educate drivers and review records for the optimization of oil, fuel, and diesel consumption.

Reviewed by:
(EMS Coordinator)

Signature

Date

EMS no.: 4.3.1
 Issue date: mm/dd/yyyy
 Revision no.: New
 Initiator signature

Attachment no. 4.3.1 (1) H

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A8. Laundry	ACTIVITY:	DATE: mm/dd/yyyy	PRODUCT: Washing of Lab Coats and Uniforms	SERVICES: Steam Generation		
LOCATION: Washing Room		AREA: Laundry				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE	
B8. Controlled and uncontrolled Emissions to atmosphere	<ul style="list-style-type: none"> The laundry operations are used for washing of internal gowning of staff The equipment used is electrical two washes and one dryer There is no controlled or uncontrolled emission 		—	<ul style="list-style-type: none"> No impact Air pollution prevention 	PI-007 PI-001	
C8. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> At the end of washing, the water carrying chemical residues is collected in a separate tank and is hand over to Local Municipality tankers for disposal The water discharge is controlled 		—	<ul style="list-style-type: none"> Marine water conservation 	PI-002	

SOURCE: A8. Laundry	ACTIVITY:	DATE: mm/dd/yyyy	PRODUCT: Washing of Lab Coats and Uniforms	SERVICES: Steam Generation	
LOCATION: Washing Room	AREA: Laundry				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT –VE	IMPACT +VE	IMPACT CODE
D8. Contamination of land	<ul style="list-style-type: none"> The leftover water is not drained in the land 		—	<ul style="list-style-type: none"> Land conservation 	PI-005
E8. Solid waste	<ul style="list-style-type: none"> Solid water is in dissolved form in waste water 		—	<ul style="list-style-type: none"> No impact 	PI-007
F8. Use of raw materials and other natural resources	<ul style="list-style-type: none"> Following materials are used for washing which are environmental friendly Process losses are insignificant as quantities are standardized 		—	<ul style="list-style-type: none"> Health & safety Ozone preservation 	PI-113 PI-010
G8. Use of energy	<ul style="list-style-type: none"> Use of energy is insignificant 		<ul style="list-style-type: none"> Natural resource utilization 	<ul style="list-style-type: none"> No impact 	PI-007
H8. Use of water	<ul style="list-style-type: none"> Water consumption is according to the washing quantities 		—	<ul style="list-style-type: none"> Resource optimization 	PI-113
I8. Noise, odor, dust, vibration, and visual impact	<ul style="list-style-type: none"> The overall process is self contained. No dust is produced. The process is noisy but within 90 db which is satisfactory. 		—	<ul style="list-style-type: none"> No impact 	PI-007
J8. Effects on ecosystems	<ul style="list-style-type: none"> The overall system is satisfactory (under control) and does not lead to major threat to the economic system. 		—	<ul style="list-style-type: none"> No impact 	PI-007

K8. Upstream effects—energy, water, raw materials	<ul style="list-style-type: none"> • Energy and raw material consumption, insignificant 	—	<ul style="list-style-type: none"> • No impact 	PI-007
L8. Downstream effects	<ul style="list-style-type: none"> • Energy and raw material consumption, insignificant 	—	<ul style="list-style-type: none"> • No impact 	PI-007
M8. Past effects	<ul style="list-style-type: none"> • Use of bleaching agents 	<ul style="list-style-type: none"> • Ozone depletion 	—	NI-007
N8. Future effects	<ul style="list-style-type: none"> • Use of environmental-friendly cleaning agents 	—	<ul style="list-style-type: none"> • Ozone conservation 	NI-112
O8. Selection test	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	—
P8. Environmental impact evaluation	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	—
Q8. Identification of level of significance	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score						Weighting Factor			Remarks				
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total		
Legislation	Existing Local official legislation No. 16 Personal Protection Equipment Local official information bulletin. Appendix 1, 1.2 Regulation on the disposal of waste water into marine environment. Local information Appendix 1 1.4 Regulation on Occupational health & safety regulation 1.1 Noise control regulation Local legislation No. 64: Safety, health & environmental requirements for laundry operation	3	Impending				None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental		No detrimental None	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Local legislation • Health & safety	3	Moderate interest		Little interest		No interest None	0	3×	2	6	<i>c</i>		
Quantity	High		Medium		Low		Nil Nil	0	0×	3	0	<i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	12		

B: Ranking of Environmental Effect under other Operating Conditions													
Elements	Conditions/Score										Total		Remarks
	Condition	12	Condition	6	Condition	3	Condition	0					
Abnormal operations	—		Increased environmental impact • Using chlorinated bleaching agents for cleaning	6	No change		Reduced environmental impact		6	<i>a</i>			
Accident / emergency			Increased environmental impact • Overflow of holding tank	6	No change		Reduced environmental impact		6	<i>b</i>			
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate • Use of bleaches • Ozone depletion	6	—		No damage		6	<i>c</i>			
Planned activities			Increased environmental impact		No change	3	Reduced environmental impact • Safe disposal of waste water • Health & safety	3	3	<i>d</i>			
Other Operating Conditions Total Score = (a + b + c + d)									Total B		21		
C: Cost Factor Ranking of Environmental Effects													
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0		
Estimated	N/A		N/A		N/A		N/A		N/A		0		
Cost Factor Total C											0		
FINAL SCORE: = A + B + C											33		

Remarks: No action program required. Operational controls are adequate.

Reviewed by:
(EMS Coordinator)

Signature

Date

EMS no.: 4.3.1

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Revision no.: New

Initiator signature

Attachment no. 4.3.1(1) I

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A9. Kitchen	ACTIVITY: Cooking	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: Catering		
LOCATION: Cafeteria		AREA: Administration				
ENVIRONMENTAL ASPECT	OTHER INFORMATION			IMPACT -VE	IMPACT +VE	IMPACT CODE
B9. Controlled and uncontrolled Emissions to atmosphere	• Liquid petroleum gas is used for cooking, insignificant			—	• No impact	PI-007
C9. Controlled and uncontrolled discharges to water	• At the end of cooking, the equipments are washed with water carrying minimal food residues. The water is sent to treatment plant for recycling and used for gardening around the plant.			—	• Conservation of marine water • Recycling	PI-002 PI-009
D9. Contamination of land	• The leftover food is handed over to local municipality for disposal • The kitchen water also contains oil in washing, increasing load on waste treatment plant			—	• Health & safety • Land conservation	PI-113 PI-005

E9. Solid waste	<p>Following solid waste results from cooking process:</p> <ul style="list-style-type: none"> • Plastic bags • Cartons • Rejected kitchenware • Leftover food • Used oil (disposed by local municipality) <p>Above materials are sold to local buyers & contractor for recycling.</p>	—	<ul style="list-style-type: none"> • Health & safety • Pollution prevention 	<p>PI-113 PI-001</p>
F9. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Materials used are converted into ready-to-use food • Cooking losses are insignificant • Planned operations ensure optimization 	—	<ul style="list-style-type: none"> • Resource optimization 	PI-113
G9. Use of energy	<ul style="list-style-type: none"> • Both electrical energy & gas is used in cooking which is insignificant 	—	<ul style="list-style-type: none"> • No impact 	PI-007
H9. Use of water	<ul style="list-style-type: none"> • Water consumption is according to the quantities required for cooking or washing • The waste water is 100% recycled 	—	<ul style="list-style-type: none"> • Recycling • Good housekeeping, gardening around the plant. 	<p>PI-009 PI-008</p>
I9. Noise, odor, dusts, vibration and visual impact	<ul style="list-style-type: none"> • The overall cooking process is self-contained. No dust is produced • Adequate exhaust system removes odor 	—	<ul style="list-style-type: none"> • No impact 	PI-007
J9. Effects on ecosystems	<ul style="list-style-type: none"> • The overall system is satisfactory (under control) and does not lead to major threat to the ecosystem 	—	<ul style="list-style-type: none"> • No impact 	PI-007
K9. Upstream effects—energy, water, raw materials	<ul style="list-style-type: none"> • Not applicable 	—	—	—
L9. Downstream effects	<ul style="list-style-type: none"> • Insignificant, but staff training is required on health and safety and safe food processing 	—	<ul style="list-style-type: none"> • Health & safety 	NI-006
M9. Past effects	<ul style="list-style-type: none"> • Insignificant 	—	—	—
N9. Future effects	<ul style="list-style-type: none"> • Insignificant 	—	—	—
O9. Selection test	<ul style="list-style-type: none"> • Not applicable 	—	—	—
P9. Environmental impact evaluation	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	—
Q9. Identification of level of significance	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score							Weighting Factor			Remarks			
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply	Factor		Total		
Legislation	Existing Local legislation No. 16 Personal Protection Equipment Local legislation, Appendix 3 No. 65: Liquefied petroleum cylinders No. 38: Health & safety in kitchen & food preparation areas	3	Impending				None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental		No detrimental None	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Personnel health & safety • Legislation	3	Moderate interest		Little interest		No interest None		3×	2	6	<i>c</i>		
Quantity	High		Medium		Low Solid waste: Insignificant	1	Nil		1×	3	3	<i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A		15	

B: Ranking of Environmental Effect under other Operating Conditions												
Elements	Conditions/Score								Total		Remarks	
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations	—		Increased environmental impact • Unsafe disposal of leftover food	6	No Change		Reduced environmental impact	0	6	<i>a</i>		
Accident / emergency	• Food contamination may cause health & safety problem	12	Increased environmental impact		No change		Reduced environmental impact	0	12	<i>b</i>		
Past activities	Evident/Requires action —		Possible damage/difficult to evaluate —		—		No damage • No damage	0	0	<i>c</i>		
Planned activities			Increased environmental impact		No change		Reduced environmental impact • Maintenance of waste reduce impact	0	0	<i>d</i>		
Other Operating Conditions Total Score = (a + b + c + d)									Total B		18	

C: Cost Factor Ranking of Environmental Effects												
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0	
Estimated	N/A		N/A		N/A		N/A		N/A		0	
Cost Factor	Total C										0	
FINAL SCORE: = A + B + C Identification Level of Significance											33	

Remarks: The kitchen operations are satisfactory and require more operational control

Reviewed by:
(EMS Coordinator)

Signature

Date

EMS no.: 4.3.1
 Issue date: mm/dd/yyyy
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 Initiator signature

Attachment no. 4.3.1 (1) J

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A10. Civil Works & Maintenance	ACTIVITY: Construction	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: Carpentry/Fabrication/ Construction/Cement Manufacturing		
LOCATION: Maintenance	AREA: Workshop and Cement Mixing Plant					
ENVIRONMENTAL ASPECT	OTHER INFORMATION			IMPACT -VE	IMPACT +VE	IMPACT CODE
B10. Controlled and uncontrolled emissions to atmosphere	<ul style="list-style-type: none"> • Carpentry works • Wood • Adhesive glues, thinners are used in insignificant amounts • Maintenance workshops, all machines are used with safety precautions • Iron workshop, steel bars are cut for civil construction works • Cement mixing plant is used at the time of construction only • Adequate personnel protective equipments are used 			<ul style="list-style-type: none"> • Health & safety • Fire hazard • Ozone depletion 	<ul style="list-style-type: none"> • No impact 	NI-006 NI-114 NI-007

C10. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> • Not applicable 	—	<ul style="list-style-type: none"> • No impact 	PI-007
D10. Contamination of land	<ul style="list-style-type: none"> • Oil and fuel used for the civil work machinery /vehicles. The overall system is under control due to better maintenance of machines /vehicles and does not lead to major threat to the land contamination 	—	<ul style="list-style-type: none"> • No impact 	PI-007
E10. Solid waste	<ul style="list-style-type: none"> • Concrete • Damage blocks • Wooden scrap • Empty aluminum cans • Metal dust • Steel drums <p>Above materials are sold to local buyers & contractor for recycling</p>	—	<ul style="list-style-type: none"> • Resources utilization 	PI-113
F10. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Materials used are converted into finished products • Losses are insignificant 	—	<ul style="list-style-type: none"> • Resource optimization 	PI-113
G10. Use of energy	<ul style="list-style-type: none"> • Electrical energy consumption is insignificant 	—	<ul style="list-style-type: none"> • No impact 	PI-007
H10. Use of water	<ul style="list-style-type: none"> • Insignificant amount is used for cement mixing 	—	<ul style="list-style-type: none"> • No impact 	PI-007
I10. Noise, odor, dusts, vibration and visual impact	<ul style="list-style-type: none"> • Civil works are conducted in open space and noise is insignificant • Housekeeping is satisfactory 	—	<ul style="list-style-type: none"> • No impact 	PI-007
J10. Effects on ecosystems	<ul style="list-style-type: none"> • The overall system is under control and does not lead to major threat to the ecosystem 	—	<ul style="list-style-type: none"> • No impact 	PI-007
K10. Upstream effects—energy, water, raw materials	<ul style="list-style-type: none"> • Insignificant 	—	<ul style="list-style-type: none"> • No impact 	PI-007
L10. Downstream effects	<ul style="list-style-type: none"> • Insignificant 	—	<ul style="list-style-type: none"> • No impact 	PI-007
M10. Past effects	<ul style="list-style-type: none"> • Insignificant 	—	<ul style="list-style-type: none"> • No impact 	PI-007
N10. Future effects	<ul style="list-style-type: none"> • Insignificant 	—	<ul style="list-style-type: none"> • No impact 	PI-007
O10. Selection test	<ul style="list-style-type: none"> • Not applicable 	<ul style="list-style-type: none"> • Not applicable 	<ul style="list-style-type: none"> • Not applicable 	—
P10. Environmental impact evaluation	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	—
Q10. Identification of level of significance	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score							Weighting Factor			Remarks			
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply	Factor		Total		
Legislation	Existing Local legislation No. 16 Personal Protection Equipment Local information Appendix 1.1 Regulation on air pollution control from stationary source 1.2 Occupational health & safety regulation 1.3 Noise control regulation Local guidelines No. 25: First aid No. 52: Metal finishing industry No. 29: Requirement for the discharge of waste gases fumes and dust to the atmosphere. No. 6: Industries compound gas cylinders No. 14: Personal protective equipment—head protection No. 15: Personal protective equipment—eye & face protection No. 20: Personal protective equipment Fall protection/ safety lines.	3	Impending				None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental		No detrimental None	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Health & safety • Legislation	3	Moderate interest		Little interest		No interest None	0	3×	2	6	<i>c</i>		
Quantity	High		Medium		Low Solid waste: Insignificant	1	Nil		1×	3	3	<i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	15		

B: Ranking of Environmental Effect under other Operating Conditions												
Elements	Conditions/Score									Total		Remarks
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations	—		Increased environmental impact		No change • No Change • Unknown	3	Reduced environmental impact	0	3	<i>a</i>		
Accident / emergency		12	Increased environmental impact • Threat to health & safety	6	No change		Reduced environmental impact	0	6	<i>b</i>		
Past activities	Evident/requires action —		Possible damage/difficult to evaluate —		—		No damage • No damage	0	0	<i>c</i>		
Planned activities			Increased environmental impact		No change	3	Reduced environmental impact • Planned inspection	0	0	<i>d</i>		
Other Operating Conditions Total Score = (a + b + c + d)									Total B		9	

C: Cost Factor Ranking of Environmental Effects												
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0	
Estimated	N/A		N/A		N/A		N/A <10,000 US\$		N/A		1	
Cost Factor	Total C										1	
FINAL SCORE: = A + B + C Identification Level of Significance											25	

Remarks: Action program required for safety and environmental awareness of employees and resourcing of more safety equipment

Reviewed by:
(EMS Coordinator)

Signature

Date

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 Initiator signature

Attachment no. 4.3.1 (1) K

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A11. Tablets Processing	ACTIVITY: Tableting	DATE: mm/dd/yyyy	PRODUCT: All Tablet Products	SERVICES: N/A		
LOCATION: Plants	AREA: Manufacturing & Packaging Solids					
ENVIRONMENTAL ASPECT	OTHER INFORMATION			IMPACT -VE	IMPACT +VE	IMPACT CODE
B11. Controlled and uncontrolled emissions to atmosphere	The tableting process does not lead to controlled emission to the atmosphere			—	• Pollution prevention	PI-001
C11. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> All the end of tableting, the equipments are washed with water-carrying chemical residues. The water is sent to the treatment plant for recycling and used for gardening around the plant The water discharge is controlled and recycled 100% The total amount of waste water recycled in year 2000 was 91,037M³ 			—	<ul style="list-style-type: none"> Marine water conservation Resource optimization 	PI-002 PI-113

SOURCE: A11. Tablets Processing	ACTIVITY: Tableting	DATE: mm/dd/yyyy	PRODUCT: All Tablet Products	SERVICES: N/A	
LOCATION: Plants	AREA: Manufacturing & Packaging Solids				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
D11. Contamination of land	The tableting process does not lead to land contamination		—	• No impact	PI-007
E11. Solid waste	Following solid waste results from tableting process: <ul style="list-style-type: none"> • Empty steel drums • Plastic bags • Cartons • Aluminum seals • Empty plastic bottles • Rejected bulk materials • Damage PP caps • PVC rolls Above materials are sold to local buyers & contractor for recycling		—	—	—
F11. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Materials used are converted into finished products • Process losses are insignificant approximately 1–3% 		—	• Resource optimization	PI-009
G11. Use of energy	<ul style="list-style-type: none"> • Energy is resourced from RAK electricity department, energy use is insignificant as it is subject to production orders • Planned manufacturing minimize the energy consumption 		• Natural Resource utilization	• Energy conservation	PI-112
H11. Use of water	<ul style="list-style-type: none"> • Water consumption is insignificant during granulation, insignificant and is used • The waste water is 100% recycled 		—	• Good housekeeping, gardening around the plant	PI-008
I11. Noise, odor, dusts, vibration and visual impact	<ul style="list-style-type: none"> • The overall tableting process is self-contained. No significant dust is produced and the staff wear masks • The exhaust system ensures adequate removal of process dust • The packaging process is noisy but within 65 db. which is satisfactory 		—	<ul style="list-style-type: none"> • Health & safety • Pollution prevention 	PI-113 PI-001

J11. Effects on ecosystems	<ul style="list-style-type: none"> • Not applicable 	—	—	—
K11. Upstream effects—energy, water, raw materials	<ul style="list-style-type: none"> • Increased production will lead to increased consumption of raw materials energy and water 	<ul style="list-style-type: none"> • Resource utilization 	—	NI-110
L11. Downstream effects	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Resource utilization 	—	NI-110
M11. Past effects	<ul style="list-style-type: none"> • Old machines were not adequately equipped with dust extraction systems 	<ul style="list-style-type: none"> • Health & safety • Air pollution 	—	NI-006 NI-114
N11. Future effects	<ul style="list-style-type: none"> • The tableting operations are safe and have no threats in future operations 	—	<ul style="list-style-type: none"> • Health & safety • Air pollution prevention 	NI-113 PI-001
O11. Selection test	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	—
P11. Environmental impact evaluation	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	—
Q11. Identification of level of significance	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Condition	Conditions/Score						Weighting Factor			Remarks			
		3	Condition	2	Condition	1	Condition	0	Multiply	Factor		Total		
Legislation	Existing Local legislation No. 16 Personal Protection Equipment Local information bulletin, Appendix 1, 1.1 Regulation on the disposal of waste into marine environment Local official information Appendix 1 1.2 Regulation on air pollution control from stationary sources 1.3 Occupational health & safety regulation 1.4 Protected areas regulations	3	Impending				None		×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental		No detrimental • Controlled no impact	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Staff health & safety	3	Moderate interest		Little interest		No interest None		3×	2	6	<i>c</i>		
Quantity	High		Medium		Low • Dust is controlled by using filters	1	Nil		1×	3	3	<i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	15		

B: Ranking of Environmental Effect under other Operating Conditions												
Elements	Conditions/Score									Total		Remarks
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations	—		Increased environmental impact • Loss of pressure differential in rooms	6	No Change		Reduced environmental impact		6	a		
Accident/emergency			Increased environmental impact • Filters leakage • Rupture in dust collection bag	6	No change		Reduced environmental impact		6	b		
Past activities	Evident/Requires action —		Possible damage/difficult to evaluate • Health & safety	6	—		No damage		6	c		
Planned activities			Increased environmental impact		No change		Reduced environmental impact • Maintenance of waste water treatment plant.	0	0	d		
Other Operating Conditions Total Score = (a + b + c + d)									Total B		15	
C: Cost Factor Ranking of Environmental Effects												
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0	
Estimated	N/A		N/A		N/A		N/A		N/A		0	
Cost Factor Total C										0		
FINAL SCORE: = A + B + C										33		

Remarks: Action program required connect new plant waste water to existing waste water treatment plant

Reviewed by:
(EMS Coordinator)

Signature

Date

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 Initiator signature

Attachment no. 4.3.1 (1) L

Environmental Aspect Significance Evaluation Matrix

Prepared By: Concerned Manager

SOURCE: A12. Capsules Processing	ACTIVITY: Capsulation	DATE: mm/dd/yyyy	PRODUCT: All Capsules	SERVICES: N/A	
LOCATION: Plants	AREA: Manufacturing & Packaging				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
B12. Controlled and uncontrolled emissions to atmosphere	The capsulation process does not lead to controlled emission to the atmosphere		—	• Pollution prevention	PI-001
C12. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> All the end of capsulation, the equipments are washed with water carrying chemical residues. The water is sent to the treatment plant for recycling and used for watering around the plant The water discharge is controlled 		—	• Marine water conservation	PI-002
D12. Contamination of land	The capsulation process does not lead to land contamination		—	• No impact	PI-007

H12. Solid waste	<p>Following solid waste results from the capsulation process:</p> <ul style="list-style-type: none"> • Empty steel drums • Plastic bags • Cartons • Aluminum seals • Empty plastic bottles • Rejected bulk materials • Damage PP caps • PVC rolls <p>Above materials are sold to local buyers & contractor for recycling</p>	—	—	—
F12. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Materials used are converted into finished products • Process losses are insignificant, approximately 1–3% 	—	<ul style="list-style-type: none"> • Resources optimization 	PI-113
G12. Use of energy	<ul style="list-style-type: none"> • Energy is resourced from local electricity department, energy use is insignificant as it is subject to production orders • Planned manufacturing minimize the energy consumption 	<ul style="list-style-type: none"> • Natural resource utilization 	<ul style="list-style-type: none"> • Energy conservation 	PI-007
H12. Use of water	<ul style="list-style-type: none"> • During processing water is not only used for cleaning of equipments • The waste water is 100% recycled 	—	<ul style="list-style-type: none"> • Good housekeeping, gardening around the plant • Waste water recycling 	PI-008 PI-009
I12. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> • The overall capsulation process is self-contained. No significant dust is produced staff wear mask • The packaging process is noisy but within 65 db which is satisfactory 	—	<ul style="list-style-type: none"> • Health & safety • Pollution prevention 	PI-113 PI-001
J12. Effects on ecosystems	<ul style="list-style-type: none"> • N/A 	—	—	NI-007
K12. Upstream effects—energy, water, and raw materials	<ul style="list-style-type: none"> • Increased production will lead to increase consumption of raw materials energy and water 	<ul style="list-style-type: none"> • Resource utilization 	—	—
L12. Downstream effects	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Resource utilization 	<ul style="list-style-type: none"> • No impact 	PI-007
M12. Past effects	<ul style="list-style-type: none"> • Old capsulation was not adequately equipped with dust extraction systems 	<ul style="list-style-type: none"> • Health & safety • Air pollution 	—	NI-006 NI-114

SOURCE: A12. Capsules Processing	ACTIVITY: Capsulation	DATE: mm/dd/yyyy	PRODUCT: All Capsules	SERVICES: N/A	
LOCATION: Plants	AREA: Manufacturing & Packaging				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
N12. Future effects	• The capsulation operations are safe and have no threats in future operations		—	• Health & safety • Pollution prevention	NI-113 PI-001
O12. Selection test	• N/A		• N/A	• N/A	—
P12. Environmental impact evaluation	• As above		• As above	• As above	—
Q12. Identification of level of significance	• As follows		• As follows	• As follows	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score						Weighting Factor			Remarks				
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total		
Legislation	Existing Local legislation No. 16 Personal Protection Equipment Local information bulletin, Appendix 1, 1.1 Regulation on the disposal of waste into marine environment. 1.2 Regulation on air pollution control from stationary sources 1.3 Occupational health & safety regulation 1.4 Protected areas regulations	3	Impending				None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental • Air pollution	1	No detrimental None		1×	3	3	<i>b</i>		
Interested parties	Considerable interest • Staff health & safety • Air pollution	3	Moderate interest		Little interest		No interest None	0	3×	2	6	<i>c</i>		
Quantity	High		Medium		Low	1	Nil Dust: Not quantifiable	0	0×	3	0	<i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	15		

B: Ranking of Environmental Effect under other Operating Conditions												
Elements	Conditions/Score								Total		Remarks	
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations	—		Increased environmental impact • Dust extraction system switched off	6	No Change		Reduced environmental impact		6	<i>a</i>		
Accident / emergency			Increased environmental impact • Dust collection system failure	6	No change	3	Reduced environmental impact		6	<i>b</i>		
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate • Health & safety • Air pollution	6	—		No damage		6	<i>c</i>		
Planned activities			Increased environmental impact		No change		Reduced environmental impact • Planned maintenance	0	0	<i>d</i>		
Other Operating Conditions Total Score = (a + b + c + d) Total B									18			
C: Cost Factor Ranking of Environmental Effects												
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0	
Estimated	N/A		N/A		N/A		N/A		N/A		0	
Cost Factor	Total C										0	
FINAL SCORE: = A + B + C Identification Level of Significance											33	

Remarks: Yearly orientation of staff on health & safety and prevention of pollution

Reviewed by:
(EMS Coordinator)

Signature

Date

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Attachment no. 4.3.1 (1) M

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A13. Powders Processing	ACTIVITY: PPS Mfg.	DATE: mm/dd/yyyy	PRODUCT: Powders for Suspension	SERVICES: N/A	
LOCATION: Plants	AREA: Manufacturing & Packaging				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
B13. Controlled and uncontrolled emissions to atmosphere	<ul style="list-style-type: none"> The powders filling process does not lead to controlled or uncontrolled emission to the atmosphere 		—	<ul style="list-style-type: none"> Pollution prevention 	PI-001
C13. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> At the end of powders filling, the equipments are washed with water carrying chemical residues. The water is sent to the treatment plant for recycling and used for gardening purposes The water discharge is controlled 		—	<ul style="list-style-type: none"> Marine water conservation 	PI-002
D13. Contamination of land	<ul style="list-style-type: none"> The powders filling process does not involve direct land contamination 		—	<ul style="list-style-type: none"> No impact 	PI-007

SOURCE: A13. Powders Processing	ACTIVITY: PPS Mfg.	DATE: mm/dd/yyyy	PRODUCT: Powders for Suspension	SERVICES: N/A		
LOCATION: Plants		AREA: Manufacturing & Packaging				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE	
E13. Solid waste	Following solid waste results from powders filling process: <ul style="list-style-type: none"> • Empty steel drums • Plastic bags • Cartons • Aluminum seals • Empty plastic bottles • Rejected bulk materials • Damage PP caps • PVC rolls Above materials are sold to local buyers & contractor for recycling		—	—	—	
F13. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Materials used are converted into finished products • Process losses are insignificant 		• Natural resource utilization	• Resources optimization	PI-113	
G13. Use of energy	<ul style="list-style-type: none"> • Energy is resourced from Local electricity department • The amount used is reciprocal to output • Planned production activities are encouraged to prevent electrical energy losses 		• Natural resource utilization	• Energy conservation	PI-113	
H13. Use of water	<ul style="list-style-type: none"> • Water is used only for washing • The waste water is 100% recycled 		—	<ul style="list-style-type: none"> • Good housekeeping, gardening purposes • Waste water recycling 	PI-008 PI-009	
I13. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> • The overall powders filling process is self contained. No significant dust is produced and staff wear masks • The packaging process is noisy but within 60 db which is satisfactory 		—	<ul style="list-style-type: none"> • Health & safety • Pollution prevention 	PI-113 PI-001	

J13. Effects on ecosystems	<ul style="list-style-type: none"> • Not applicable 	—	—	—
K13. Upstream effects—energy, water, and raw materials	<ul style="list-style-type: none"> • Increased production will lead to increased consumption of energy and water & materials 	<ul style="list-style-type: none"> • Resource utilization 	—	—
L13. Downstream effects	<ul style="list-style-type: none"> • Consumption of natural resources 	<ul style="list-style-type: none"> • Resource utilization 	<ul style="list-style-type: none"> • No impact 	NI-010
M13. Past effects	<ul style="list-style-type: none"> • Old powder filling machines were not fitted with dust extraction systems 	<ul style="list-style-type: none"> • Health & safety • Air pollution 	—	NI-006 NI-114
N13. Future effects	<ul style="list-style-type: none"> • The new powders filling machines are safe and have adequate dust extraction 	—	<ul style="list-style-type: none"> • Health & safety • Pollution prevention 	NI-113 PI-001
O13. Selection test	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	—
P13. Environmental impact evaluation	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • As above 	—
Q13. Identification of level of significance	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	<ul style="list-style-type: none"> • As follows 	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects Under Normal Operation Conditions														
Elements	Conditions/Score						Weighting Factor			Remarks				
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total		
Legislation	Existing Local legislation No. 16 Personal Protection Equipment Local information bulletin, Appendix 1, 1.1 Regulation on the disposal of waste into marine environment. 1.2 Regulation on air pollution control from stationary sources 1.3 Occupational health & safety regulation 1.4 Protected areas regulations	3	Impending				None	3	3x	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental • Air pollution	1	No detrimental None		1x	3	3	<i>b</i>		
Interested parties	Considerable interest • Staff health & safety • Air pollution	3	Moderate interest		Little interest		No interest None		3x	2	6	<i>c</i>		
Quantity	High		Medium	2	Low	1 1	Nil Not quantifiable	0	0x	3	0	<i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	15		

B: Ranking of Environmental Effect under other Operating Conditions												
Elements	Conditions/Score								Total		Remarks	
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations	—		Increased environmental impact • Dust extraction system switched off	6	No change	3	Reduced environmental impact		6	a		
Accident / emergency			Increased environmental impact • Dust collection system failure	6	No change		Reduced environmental impact		6	b		
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate • Health & safety • Air pollution	6	—		No damage		6	c		
Planned activities			Increased environmental impact		No change		Reduced environmental impact • Planned maintenance.	3	3	d		
Other operating conditions total score = (a + b + c + d) Total B									21			
C: Cost Factor Ranking of Environmental Effects												
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0	
Estimated	N/A		N/A		N/A		N/A		N/A		0	
Cost Factor Total C										0		
FINAL SCORE: = A + B + C Identification Level Of Significance										36		

Remarks: Yearly orientation of staff on health & safety and prevention of pollution

Reviewed by:
(EMS Coordinator)

Signature

Date

EMS no.: 4.3.1
 Issue date: mm/dd/yyyy
 Revision no.: New
 Initiator signature

Attachment no. 4.3.1 (1) N

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A14. Semisolids Processing	ACTIVITY: Semisolid Mfg.	DATE: mm/dd/yyyy	PRODUCT: All Creams, Ointments, and Suppositories	SERVICES: N/A		
LOCATION: Plant VI		AREA: Manufacturing and Packaging				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE	
B14. Controlled and uncontrolled emissions to atmosphere	<ul style="list-style-type: none"> The semisolid products processing does not lead to controlled or uncontrolled emission to atmosphere 		—	<ul style="list-style-type: none"> Pollution prevention 	PI-001	
C14. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> At the end of semisolid processing, the equipments are washed with water carrying chemical residues. The water is sent to the treatment plant for recycling and used for gardening purposes The water discharge is controlled 		—	<ul style="list-style-type: none"> Marine water conservation Recycling 	PI-002 PI-009	
D14. Contamination of land	<ul style="list-style-type: none"> The semisolid manufacturing process does not involve direct land contamination 		—	<ul style="list-style-type: none"> No impact 	PI-007	

E14. Solid waste	<p>Following solid waste results from tableting process:</p> <ul style="list-style-type: none"> • Empty steel drums • Plastic bags • Cartons • Aluminum seals • Rejected bulk materials • Aluminum tubes <p>Above materials are sold to local buyers & contractor for recycling</p>	—	<ul style="list-style-type: none"> • Recycling 	PI-009
F14. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Materials used are converted into finished products • Process losses are insignificant 	—	<ul style="list-style-type: none"> • Resources optimization 	PI-113
G14. Use of energy	<ul style="list-style-type: none"> • Energy is resourced from local electricity department, organized production energy consumption 	—	<ul style="list-style-type: none"> • Energy optimization 	PI-112
H14. Use of water	<ul style="list-style-type: none"> • The only water consumed for cleaning of equipment • The waste water is 100% recycled 	—	<ul style="list-style-type: none"> • Good housekeeping, gardening purposes • Recycling 	PI-008 PI-009
I14. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> • The overall semisolid processing is self-contained. No dust is produced • The packaging process is noisy but within 90 db which is satisfactory 	—	<ul style="list-style-type: none"> • No impact 	PI-007
J14. Effects on ecosystems	<ul style="list-style-type: none"> • The overall system is satisfactory (under control) and does not lead to major threat to the economic system 	—	<ul style="list-style-type: none"> • No impact 	PI-007
K14. Upstream effects—energy, water, and raw materials	<ul style="list-style-type: none"> • N/A 	—	<ul style="list-style-type: none"> • No impact 	PI-007
L14. Downstream effects	<ul style="list-style-type: none"> • N/A 	—	—	—
M14. Past effects	<ul style="list-style-type: none"> • Fats discharged in local sewage 	—	<ul style="list-style-type: none"> • Marine water pollution 	NI-115

SOURCE: A14. Semisolids Processing	ACTIVITY: Semisolid Mfg.	DATE: mm/dd/yyyy	PRODUCT: All Creams, Ointments, and Suppositories	SERVICES: N/A	
LOCATION: Plant VI	AREA: Manufacturing and Packaging				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
N14. Future effects	<ul style="list-style-type: none"> The semi-solid manufacturing operations are safe and have no threats in future operations 		—	<ul style="list-style-type: none"> Marine water conservation 	PI-002
O14. Selection test	<ul style="list-style-type: none"> N/A 		<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	—
P14. Environmental impact evaluation	<ul style="list-style-type: none"> As above 		<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above 	—
Q14. Identification of level of significance	<ul style="list-style-type: none"> As follows 		<ul style="list-style-type: none"> As follows 	<ul style="list-style-type: none"> As follows 	—

Key: 0 = Insignificant, 1-20 = Slightly significant, 21-35 = Significant, 36-Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects Under Normal Operation Conditions													
Elements	Conditions/Score						Weighting Factor			Remarks			
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total	
Legislation	Existing Local legislation No. 16 Personal Protection Equipment Local information bulletin, Appendix 1, 1.2 Regulation on the disposal of waste water into marine environment Local information Appendix 1 1.3 Regulation on air pollution control from stationary sources 1.4 Occupational health & safety regulation 1.5 Noise control regulation	3	Impending				None	3	3×	2	6	a	
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental	1	No detrimental None	0	0×	3	0	b	
Interested parties	Considerable interest • Staff health & safety	3	Moderate interest	2	Little interest		No interest		3×	2	6	c	
Quantity	High		Medium		Low	1	Nil Not quantifiable	0	0×	3	0	d	
Normal operating conditions total = (a + b + c + d)											Total A	12	

B: Ranking of Environmental Effect under other Operating Conditions													
Elements	Conditions/Score										Total		Remarks
	Condition	12	Condition	6	Condition	3	Condition	0					
Abnormal operations	—		Increased environmental impact —		No change • No change	3	Reduced environmental impact	3	3	a			
Accident / emergency			Increased environmental impact • Discharge of manufacturing vessel	6	No change		Reduced environmental impact	3	6	b			
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate • Marine water pollution	6	—		No damage	0	6	c			
Planned activities			Increased environmental impact		No change	3	Reduced environmental impact • Planned maintenance will reduce impacts	3	3	d			
Other operating conditions total score = (a + b + c + d) Total B									18				
C: Cost Factor Ranking of Environmental Effects													
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0		
Estimated	N/A		N/A		N/A		N/A		N/A		0		
Cost Factor	Total C										0		
FINAL SCORE: = A + B + C Identification level of significance											30		

Remarks: Yearly orientation of staff on health & safety and prevention of pollution

Reviewed by:
(EMS Coordinator)

Signature

Date

Attachment no. 4.3.1 (1) O

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A15. Liquid Processing	ACTIVITY: Liquid Processing Mfg.	DATE: mm/dd/yyyy	PRODUCT: All Syrups, Suspensions, and Drops	SERVICES: N/A	
LOCATION: Plants	AREA: Manufacturing and Packaging				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT-VE	IMPACT +VE	IMPACT CODE
B15. Controlled and uncontrolled emissions to atmosphere	<ul style="list-style-type: none"> The liquid products manufacturing & packaging process does not lead to controlled or uncontrolled emission to the atmosphere 		—	<ul style="list-style-type: none"> Pollution prevention 	PI-001
C15. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> At the end of liquids manufacturing processes, the equipments are washed with water carrying chemical residues. The water is sent to the treatment plant for recycling and used for gardening purposes The water discharge is controlled 		—	<ul style="list-style-type: none"> Marine water conservation 	PI-002

SOURCE: A15. Liquid Processing	ACTIVITY: Liquid Processing Mfg.	DATE: mm/dd/yyyy	PRODUCT: All Syrups, Suspensions, and Drops	SERVICES: N/A		
LOCATION: Plants		AREA: Manufacturing and Packaging				
ENVIRONMENTAL ASPECT	OTHER INFORMATION			IMPACT -VE	IMPACT +VE	IMPACT CODE
D15. Contamination of land	<ul style="list-style-type: none"> The liquids manufacturing process does not involve direct land contamination 			—	<ul style="list-style-type: none"> No impact 	PI-007
E15. Solid waste	Following solid waste results from liquid process: <ul style="list-style-type: none"> Empty steel drums Plastic bags Cartons Aluminum seals Empty plastic bottles Rejected bulk materials Damage PP caps PVC rolls Above materials are sold to local buyers & contractor for recycling			—	—	—
F15. Use of raw materials and other natural resources	<ul style="list-style-type: none"> Materials used are converted into finished products Process losses are insignificant 1-3% 			—	<ul style="list-style-type: none"> Resources optimization 	PI-113
G15. Use of energy	<ul style="list-style-type: none"> Energy is resourced from local electricity department. Insignificant due to planned activities 			—	<ul style="list-style-type: none"> Energy conservation 	PI-112
H15. Use of water	<ul style="list-style-type: none"> Water is used for processing according to the process order or washing of equipment The waste water is 100% recycled 			—	<ul style="list-style-type: none"> Irrigation 	PI-008
I15. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> The overall liquid processing process is self-contained. No significant dust is produced The packaging process is noisy but within 90 db which is satisfactory 			—	<ul style="list-style-type: none"> No impact 	PI-007

J15. Effects on ecosystems	<ul style="list-style-type: none"> The overall system is satisfactory (under control) and does not lead to major threat to the eco system 	—	<ul style="list-style-type: none"> No impact 	PI-007
K15. Upstream effects—energy, water, and raw materials	<ul style="list-style-type: none"> Increased production will lead to increased consumption of energy and water & materials 	—	<ul style="list-style-type: none"> No impact 	PI-007
L15. Downstream effects	<ul style="list-style-type: none"> N/A 	—	—	—
M15. Past effects	<ul style="list-style-type: none"> Washing discharged to local sewage 	<ul style="list-style-type: none"> Marine water pollution 	—	NI-115
N15. Future effects	<ul style="list-style-type: none"> The liquids manufacturing operation are safe and have no threats in future operations 	—	<ul style="list-style-type: none"> Marine water pollution 	PI-002
O15. Selection test	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	—
P15. Environmental impact evaluation	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above 	—
Q15. Identification of level of significance	<ul style="list-style-type: none"> As follows 	<ul style="list-style-type: none"> As follows 	<ul style="list-style-type: none"> As follows 	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects Under Normal Operation Conditions														
Elements	Conditions/Score							Weighting Factor			Remarks			
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply	Factor		Total		
Legislation	Existing Local legislation No. 16 Personal Protection Equipment Local information bulletin, Appendix 1, 1.1 Regulation on the disposal of waste into marine environment. 1.2 Regulation on air pollution control from stationary sources 1.3 Occupational health & safety regulation 1.4 Protected areas regulations	3	Impending				None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental	1	No detrimental None	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Staff health & safety	3	Moderate interest		Little interest		No interest None		3×	2	6	<i>c</i>		
Quantity	High		Medium		Low Solid waste: Insufficient	1 1	Nil Dust: Not quantifiable	0	0×	3	0	<i>d</i>		
Normal operating conditions total = (a + b + c + d)											Total A		12	

B: Ranking of Environmental Effect under other Operating Conditions														
Elements	Conditions/Score										Total		Remarks	
	Condition	12	Condition	6	Condition	3	Condition	0						
Abnormal operations	—		Increased environmental impact		No change • Not unknown	3	Reduced environmental impact	3	3	<i>a</i>				
Accident / emergency			Increased environmental impact		No change • Manufacturing vessels discharge	3	Reduced environmental impact	3	3	<i>b</i>				
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate		Discharge to local sewage	3	No damage	0	36	<i>c</i>				
Planned activities			Increased environmental impact		No change	3	Reduced environmental impact • Planned waste water treatment	3	3	<i>d</i>				
Other operating conditions total score = (a + b + c + d)									Total B		21			
C: Cost Factor Ranking of Environmental Effects														
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks		
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0			
Estimated	N/A		N/A		N/A		N/A		N/A		0			
Cost Factor Total C											0			
FINAL SCORE: = A + B + C											Identification level of significance		24	

Remarks: Yearly orientation of staff on health & safety and prevention of pollution

Reviewed by:
(EMS Coordinator)

Signature

Date

EMS no.: 4.3.1
 Issue date: mm/dd/yyyy
 Revision no.: New
 Initiator signature

Attachment no. 4.3.1 (1) P

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A16. Sterile Processing	ACTIVITY: Sterile Mfg.	DATE: mm/dd/yyyy	PRODUCT: All Terminally and Aseptically Sterilized Products, Ready-to-Use Syringes and Lyophilized Products	SERVICES: N/A		
LOCATION: Plant II	AREA					
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE	
B16. Controlled and uncontrolled emissions to atmosphere	The sterile process does not lead to controlled or uncontrolled emission to the atmosphere		—	• Pollution prevention	PI-001	
C16. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> At the end of sterile processing, the equipments are washed with water carrying chemical residues. The water is sent to the treatment plant for recycling and used for gardening purposes The water discharge is controlled Staff wears adequate safety equipment 		—	<ul style="list-style-type: none"> Recycling Marine water conservation 	PI-009 PI-002	

D16. Contamination of land	<ul style="list-style-type: none"> The sterile processing does not involve direct land contamination 	—	<ul style="list-style-type: none"> Recycling Irrigation 	PI-009 PI-008
E16. Solid waste	<p>Following solid waste results from tableting process:</p> <ul style="list-style-type: none"> Empty steel drums Plastic bags Cartons Aluminum seals Broken ampoules/vials/syringes Rejected bulk materials Rubber stoppers <p>Above materials are sold to local buyers & contractor for recycling. The quantities are exceptionally low.</p>	—	<ul style="list-style-type: none"> Recycling 	PI-009
F16. Use of raw materials and other natural resources	<ul style="list-style-type: none"> Materials used are converted into finished products Process losses are insignificant 1–3% 	—	<ul style="list-style-type: none"> Resource optimization 	PI-113
G16. Use of energy	<ul style="list-style-type: none"> Energy is resourced from local electricity department Energy consumption is optimized through adequate planning 	<ul style="list-style-type: none"> Natural resource utilization 	<ul style="list-style-type: none"> Energy conservation 	PI-112
H16. Use of water	<ul style="list-style-type: none"> Water consumption is according to the production, orders The waste water is 100% recycled 	—	<ul style="list-style-type: none"> Recycling Pollution prevention 	PI-009 PI-001
I16. Noise, odor, dusts, vibration and visual impact	<ul style="list-style-type: none"> The overall process is self-contained. No significant dust is produced The filling process is noisy but within 90 db which is satisfactory 	—	<ul style="list-style-type: none"> No impact 	PI-007
J16. Effects on ecosystems	<ul style="list-style-type: none"> The overall system is satisfactory (under control) and does not lead to major threat to the ecosystem 	—	<ul style="list-style-type: none"> No impact 	PI-007
K16. Upstream effects—energy, water, raw materials	<ul style="list-style-type: none"> N/A 	—	<ul style="list-style-type: none"> No impact 	PI-007
L16. Downstream effects	<ul style="list-style-type: none"> N/A 	—	<ul style="list-style-type: none"> No impact 	PI-007
M16. Past effects	<ul style="list-style-type: none"> N/A 	—	<ul style="list-style-type: none"> No impact 	PI-007
N16. Future effects	<ul style="list-style-type: none"> The sterile operations are safe and have no threats in future operations 	—	<ul style="list-style-type: none"> No impact 	PI-007

SOURCE: A16. Sterile Processing	ACTIVITY: Sterile Mfg.	DATE: mm/dd/yyyy	PRODUCT: All Terminally and Aseptically Sterilized Products, Ready-to-Use Syringes and Lyophilized Products	SERVICES: N/A	
LOCATION Plant II	AREA				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT-VE	IMPACT +VE	IMPACT CODE
O16. Selection test	• N/A		• N/A	• N/A	—
P16. Environmental impact evaluation	• As above		• As above	• As above	—
Q16. Identification of level of significance	• As follows		• As follows	• As follows	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score						Weighting Factor			Remarks				
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total		
Legislation	Existing Local legislation No. 16 Personal protection equipment Local information bulletin, Appendix 1, 1.2 Regulation on the disposal of waste water into marine environment Local information Appendix 1 1.3 Regulation on air pollution control from stationary sources 1.4 Occupational health & safety regulation 1.5 Noise control regulation	3	Impending				None	3×	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental		Not detrimental None	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Staff health & safety	3	Moderate interest		Little interest		No interest		3×	2	6	<i>c</i>		
Quantity	High		Medium		Low • Low waste	1	Nil	0	1×	3	3	<i>d</i>		
Normal operating conditions total = (a + b + c + d)											Total A		15	

B: Ranking of Environmental Effect under other Operating Conditions													
Elements	Conditions/Score										Total		Remarks
	Condition	12	Condition	6	Condition	3	Condition	0					
Abnormal operations	—		Increased environmental impact		No change • Unknown	3	Reduced environmental impact	0	3	<i>a</i>			
Accident / emergency			Increased environmental impact		No change • Accidental opening of solution preparation tank	3	Reduced environmental impact	0	3	<i>b</i>			
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate —		—		No damage • None	0	0	<i>c</i>			
Planned activities			Increased environmental impact		No change		Reduced environmental impact • Waste water recycling will result in irrigation	3	3	<i>d</i>			
Other operating conditions total score = (a + b + c + d) Total B									9				
C: Cost Factor Ranking of Environmental Effects													
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0		
Estimated	N/A		N/A		N/A		N/A		N/A		0		
Cost Factor Total C											0		
FINAL SCORE: = A + B + C Identification level of significance											24		

Remarks: Yearly orientation of staff on health & safety and prevention of pollution

Reviewed by:
(EMS Coordinator)

Signature

Date

EMS no.: 4.3.1
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 Initiator signature

Attachment no. 4.3.1 (1) Q

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A17. Sterile Powder Filling	ACTIVITY: Sterile Filling	DATE: mm/dd/yyyy	PRODUCT: Sterile Powder Filling	SERVICES: N/A		
LOCATION: Plant II		AREA				
ENVIRONMENTAL ASPECT		OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
B17. Controlled and uncontrolled emissions to the atmosphere		The sterile process does not lead to controlled or uncontrolled emission to the atmosphere		—	<ul style="list-style-type: none"> • Pollution prevention 	PI-001
C17. Controlled and uncontrolled discharges to water <ul style="list-style-type: none"> • The water discharge is controlled • Staff wears adequate safety equipments 		<ul style="list-style-type: none"> • At the end of sterile processing, the equipments are washed with water carrying chemical residues. The water is sent to the treatment plant for recycling and used for gardening purposes 		—	<ul style="list-style-type: none"> • Recycling • Marine water conservation 	PI-009 PI-002

SOURCE: A17. Sterile Powder Filling	ACTIVITY: Sterile Filling	DATE: mm/dd/yyyy	PRODUCT: Sterile Powder Filling	SERVICES: N/A		
LOCATION: Plant II		AREA				
ENVIRONMENTAL ASPECT		OTHER INFORMATION		IMPACT –VE	IMPACT +VE	IMPACT CODE
D17. Contamination of land		<ul style="list-style-type: none"> The sterile processing does not involve direct land contamination 		—	<ul style="list-style-type: none"> Recycling Irrigation 	PI-009 PI-008
E17. Solid waste		<p>Following solid waste results from tableting process:</p> <ul style="list-style-type: none"> Empty steel drums Broken ampoules/vials/syringes Plastic bags Cartons Rubber stoppers Aluminum seals Rejected bulk materials <p>Few of the above materials are sold to local buyers & contractors for recycling. The rejected bulk material are handed over to municipality for safe disposal. The quantities are exceptionally low</p>		—	<ul style="list-style-type: none"> Recycling 	PI-009
F17. Use of raw materials and other natural resources		<ul style="list-style-type: none"> Materials used are converted into finished products Process losses are insignificant 1–3% 		—	<ul style="list-style-type: none"> Resource optimization 	PI-113
G17. Use of energy		<ul style="list-style-type: none"> Energy is resourced from local electricity department Energy consumption is optimized through adequate planning 		<ul style="list-style-type: none"> Natural resource utilization 	<ul style="list-style-type: none"> Energy conservation 	PI-112
H17. Use of water		<ul style="list-style-type: none"> Water consumption is according to the production, orders The waste water is 100% recycled 		—	<ul style="list-style-type: none"> Recycling Pollution prevention 	PI-009 PI-001

I17. Noise, odor, dust, vibration, and visual impact	<ul style="list-style-type: none"> The overall process is self-contained. No significant dust is produced The filling process is noisy but within 90 db which is satisfactory 	—	• No impact	PI-007
J17. Effects on ecosystems	<ul style="list-style-type: none"> The overall system is satisfactory (under control) and does not lead to major threat to the ecosystem 	—	• No impact	PI-007
K17. Upstream effects—energy, water, raw materials	<ul style="list-style-type: none"> N/A 	—	• No impact	PI-007
L17. Downstream effects	<ul style="list-style-type: none"> N/A 	—	• No impact	PI-007
M17. Past effects	<ul style="list-style-type: none"> N/A 	—	• No impact	PI-007
N17. Future effects	<ul style="list-style-type: none"> The sterile operations are safe and have no threats in future operations 	—	• No impact	PI-007
O17. Selection test	<ul style="list-style-type: none"> N/A 	• N/A	• N/A	—
P17. Environmental impact evaluation	<ul style="list-style-type: none"> As above 	• As above	• As above	—
Q17. Identification of level of significance	<ul style="list-style-type: none"> As follows 	• As follows	• As follows	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score						Weighting Factor			Remarks				
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total		
Legislation	Existing local legislation No. 16 Personal protection equipment Local information bulletin, Appendix 1, 1.2 Regulation on the disposal of waste water into marine environment Local information Appendix 1 1.3 Regulation on air pollution control from stationary		Impending				None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental		No detrimental	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Staff health & safety	3	Moderate interest		Little interest		No interest		3×	2	6	<i>c</i>		
Quantity	High		Medium		Low • Low waste	1	Nil	0	1×	3	0	<i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	15		

B: Ranking of Environmental Effect under other Operating Conditions												
Elements	Conditions/Score									Total		Remarks
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations	—		Increased environmental impact —		No change • Unknown	3	Reduced environmental impact	0	3	<i>a</i>		
Accident/ emergency			Increased environmental impact	6	No change • Accidental cuts due to unsafe handling health & safety	3	Reduced environmental impact	0	3	<i>b</i>		
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate —		—		No damage • None	0	0	<i>c</i>		
Planned activities			Increased environmental impact		No change		Reduced environmental impact • Waste recycling will result in irrigation	3	3	<i>d</i>		
Other operating conditions total score = (a + b + c + d)									Total B		9	

C: Cost Factor Ranking of Environmental Effects													
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0		
Estimated	N/A		N/A		N/A		N/A	1	N/A		0		
Cost Factor	Total C										0		
FINAL SCORE: = A + B + C											Identification level of significance	24	

Remarks: Yearly orientation of staff on health & safety and prevention of pollution

Reviewed by:
(EMS Coordinator)

Signature

Date

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Attachment no. 4.3.1 (1) R

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A18. QC Lab & PDL Lab	ACTIVITY: Testing Formulation	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: N/A		
LOCATION: Plant	AREA: Administration Building		IMPACT -VE	IMPACT +VE	IMPACT CODE	
ENVIRONMENTAL ASPECT	OTHER INFORMATION					
B18. Controlled and uncontrolled emissions to the atmosphere	<ul style="list-style-type: none"> QC lab is involved in chemical & physical testing of materials & products The possible emission are from volatile organic carbons, the quantities used for testings are insignificant The chlorinated solvents used are identified and collected separately for disposal by local municipality The product development laboratory does not yield the above emission 		—	<ul style="list-style-type: none"> Health & safety Pollution prevention Ozone conservation 	PI-113 PI-001 PI-112	

SOURCE: A18. QC Lab & PDL Lab	ACTIVITY: Testing Formulation	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: N/A			
LOCATION: Plant		AREA: Administration building					
ENVIRONMENTAL ASPECT		OTHER INFORMATION			IMPACT -VE	IMPACT +VE	IMPACT CODE
C18. Controlled and uncontrolled discharges to water	<ul style="list-style-type: none"> After the completion of the experiments in QC & PDL lab. the liquid waste other than VOCs and chlorinated compounds are diluted and drained in controlled system for treatment by waste water treatment plant 			—	<ul style="list-style-type: none"> Marine water conservation 	PI-002	
D18. Contamination of land	<ul style="list-style-type: none"> The QC lab & PDL lab, solid waste is transferred to local municipality for safe disposal 			—	<ul style="list-style-type: none"> Pollution prevention 	PI-001	
E18. Solid waste	<p>Following solid waste results from lab operations:</p> <ul style="list-style-type: none"> Empty plastic bottles Plastic bags Cartons Aluminum seals Disposable shoe & head covers Biological waste Repeated finished products Rejected bulk materials PP caps PVC blisters Volatile organic solvents/local municipality Chlorinated solvents/local municipality <p>Above materials are sold to local buyers & contractor for recycling except biological waste and raw materials for safe disposal by local municipality</p>			—	<ul style="list-style-type: none"> Pollution prevention Ozone conservation 	PI-001 PI-112	
F18. Use of raw materials and other natural resources	<ul style="list-style-type: none"> Chemicals are used for testing and controlled according to test methods Amounts consumed are insignificant 			—	<ul style="list-style-type: none"> Resource optimization 	NI-113	
G18. Use of energy	<ul style="list-style-type: none"> Electrical consumption of lab equipment is insignificant 			—	<ul style="list-style-type: none"> No impact 	PI-007	
H18. Use of water	<ul style="list-style-type: none"> Water consumption is according to the testing requirements The waste water is 100%. Amount of water consumed is insignificant 			—	<ul style="list-style-type: none"> Good housekeeping, gardening around the plant 	PI-008	

I18. Noise, odor, dusts, vibration, and visual Impact	<ul style="list-style-type: none"> The overall lab operations are self-contained. No significant impact is produced 	—	<ul style="list-style-type: none"> Health & safety 	PI-113
J18. Effects on ecosystems	<ul style="list-style-type: none"> The overall system is satisfactory (under control) and does not lead to major threat to the ecosystem 	—	<ul style="list-style-type: none"> No impact 	PI-007
K18. Upstream effects—energy, water, and raw materials	<ul style="list-style-type: none"> Generation of lab waste results in spite of safe disposal increase in pollution and may affect health 	<ul style="list-style-type: none"> Health & safety 	—	NI-006
L18. Downstream effects	<ul style="list-style-type: none"> N/A 	—	<ul style="list-style-type: none"> No impact 	PI-007
M18. Past effects	<ul style="list-style-type: none"> Discharge of lab waste water to local sewage 	<ul style="list-style-type: none"> Marine water pollution 	<ul style="list-style-type: none"> No impact 	NI-115
N18. Future effects	<ul style="list-style-type: none"> The tableting operations are safe and have no threats in future operations 	—	<ul style="list-style-type: none"> Marine water conservation 	PI-002
O18. Selection test	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	—
P18. Environmental impact evaluation	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above 	—
Q18. Identification of level of significance	<ul style="list-style-type: none"> As follows 	<ul style="list-style-type: none"> As follows 	<ul style="list-style-type: none"> As follows 	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score						Weighting Factor				Remarks			
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply	Factor		Total		
Legislation	Existing Local legislation No. 16 personal Protection Equipment Local information bulletin, Appendix 1, 1.1 Regulation on the disposal of waste water into marine environment Local information Appendix 1 1.2 Regulation on air pollution control from stationary 1.3 Occupational health & safety regulation Environmental protection & safety guidelines No. 29: Requirements for the discharge of waste gases fumes & dust to atmosphere No. 20: Personal protective equipment No. 58: Policy on the control of ozone deleting substance		Impending				None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental • Ozone deletion • Air pollution	1	No detrimental None		1×	2	3	<i>b</i>		
Interested parties	Considerable interest • Staff health & safety • Legislation	3	Moderate interest		Little interest		No interest None		3×	2	6	<i>c</i>		
Quantity	High		Medium		Low • Low	1	Nil		1×	3	3	<i>d</i>		
Normal operating conditions total = (a + b + c + d)											Total A		18	

B: Ranking of Environmental Effect under other Operating Conditions												
Elements	Conditions/Score								Total		Remarks	
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations	—		Increased environmental impact • Unorganized disposal of waste —	6	No change	3	Reduced environmental impact		6	<i>a</i>		
Accident/emergency			Increased environmental impact • In case of natural disaster	6	No change	3	Reduced environmental impact		6	<i>b</i>		
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate • Air pollution	6	—		No damage • None	0	6	<i>c</i>		
Planned activities			Increased environmental impact		No change		Reduced environmental impact • Safe disposal waste	0	0	<i>d</i>		
Other operating conditions total score = (a + b + c + d)									Total B		18	

C: Cost Factor Ranking of Environmental Effects													
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0		
Estimated	N/A		N/A		N/A		N/A	1	N/A		0		
Cost Factor	Total C										0		
FINAL SCORE: = A + B + C											Identification level of significance	36	

Remarks: Orientation and training of lab and PDL staff on safety and environment

Reviewed by:
(EMS Coordinator)

Signature

Date

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 Initiator signature

Attachment no. 4.3.1 (1) S

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE:	ACTIVITY:	DATE:	PRODUCT:	SERVICES:	
A19. Stores	Storage	mm/dd/yyyy	N/A	N/A	
LOCATION: Plant		AREA: Inside and Outside the Factory			
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
B19. Controlled and uncontrolled emissions to atmosphere	The following materials do no lead to controlled or uncontrolled emission from stores operation <ul style="list-style-type: none"> Raw materials/bulk chemicals Packaging materials Finished products Flammables Hazardous chemicals Cold store Materials safety data sheets need to be updated 		—	<ul style="list-style-type: none"> Pollution prevention 	PI-001

SOURCE: A19. Stores	ACTIVITY: Storage	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: N/A		
LOCATION: Plant	AREA: Inside and Outside the Factory					
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE	
C19. Controlled and uncontrolled discharges to water	• No controlled or uncontrolled discharge are made from stores		—	• Marine water conservation	PI-002	
D19. Contamination of land	• The above materials do not contaminate		—	• Land conservation	PI-005	
E19. Solid waste	Following solid waste results from store process: <ul style="list-style-type: none"> • Empty steel drums • Plastic bags • Cartons • Aluminum seals • Rejected raw materials/local municipality • Above materials are sold to local buyers & contractors for recycling 		—	<ul style="list-style-type: none"> • Health & safety • Pollution prevention 	PI-113 PI-001	
F19. Use of raw materials and other natural resources	• Waste pallets are purchased		—	• Resource optimization	PI-113	
G19. Use of energy	• Energy is resourced from local electricity department, for air conditioning to high electrical energy consumption, maintain stores temperature optimal		• High electrical consumption	—	NI-115	
H19. Use of water	• Water is used only for cleaning purposes, insignificant amount		—	• Good housekeeping, gardening purposes	PI-008	

I19. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> The forklift used are battery operated and lead to characteristics odor, insignificant amount 	—	<ul style="list-style-type: none"> No impact 	PI-007
J19. Effects on ecosystems	<ul style="list-style-type: none"> The overall system is satisfactory (under control) and does not lead to major threat to the ecosystem 	—	<ul style="list-style-type: none"> No impact 	PI-007
K19. Upstream effects—energy, water, raw materials	<ul style="list-style-type: none"> N/A 	—	<ul style="list-style-type: none"> No impact 	PI-007
L19. Downstream effects	<ul style="list-style-type: none"> N/A 	—	<ul style="list-style-type: none"> No impact 	PI-007
M19. Past effects	<ul style="list-style-type: none"> N/A 	—	<ul style="list-style-type: none"> No impact 	PI-007
N19. Future effects	<ul style="list-style-type: none"> The store operations are safe and have no threats in future operations 	—	<ul style="list-style-type: none"> No impact 	PI-007
O19. Selection test	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	—
P19. Environmental impact evaluation	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above 	—
Q19. Identification of level of significance	<ul style="list-style-type: none"> As follows 	<ul style="list-style-type: none"> As follows 	<ul style="list-style-type: none"> As follows 	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score							Weighting Factor			Remarks			
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply	Factor		Total		
Legislation	Existing Local legislation No. 16 Personal protection equipment Local information bulletin, Appendix 1, 1.1 Regulation on air pollution control from stationary sources. 1.2 Occupational health & safety regulation		Impending				None		0×	2	0	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental • Ozone deletion • Air pollution		No detrimental None	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Local legislation	3	Moderate interest		Little interest		No interest None		3×	2	6	<i>c</i>		
Quantity	High		Medium • Insignificant	2	Low • Solid waste insignificant	1	Nil		1×	3 3	6 0	<i>d</i>		
Normal operating conditions total = (a + b + c + d)											Total A		12	

B: Ranking of Environmental Effect under other Operating Conditions												
Elements	Conditions/Score								Total		Remarks	
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations	—		Increased environmental impact • Unsafe handling or transfer to weighing area —	6	No change		Reduced environmental impact	0	6	<i>a</i>		
Accident/emergency			Increased environmental impact • Accidental fire • Air pollution • Land pollution • Marine water pollution	6	No change		Reduced environmental impact	0	6	<i>b</i>		
Past activities	Evident/ Requires action -		Possible damage/difficult to evaluate	6	—		No damage • None	0	6	<i>c</i>		
Planned activities			Increased environmental impact		No change		Reduced environmental impact • Planned inspection & safe handling	0	0	<i>d</i>		
Other operating conditions total score = (a + b + c + d)								Total B		18		

C: Cost Factor Ranking of Environmental Effects												
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0	
Estimated	N/A		N/A		N/A		N/A		N/A		0	
Cost Factor	Total C										0	
FINAL SCORE: = A + B + C Identification Level Of Significance											30	

Remarks: Orientation and training of stores staff on safety and environment

Reviewed by:
(EMS Coordinator)

Signature

Date

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Attachment no. 4.3.1 (1) T

Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A20. Administration	ACTIVITY: Routine Operation	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: N/A		
LOCATION: Offices		AREA: Plant I, II, III, & Administration				
ENVIRONMENTAL ASPECT		OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
B20. Controlled and uncontrolled emissions to the atmosphere	• N/A			—	• Pollution preservation	PI-001
C20. Controlled and uncontrolled discharges to water	• Sewage control and recycled			—	• Marine water conservation	PI-002
D20. Contamination of land	• Administration operations do not lead to land contamination			—	• Land conservation	PI-005
E20. Solid waste	Following solid waste results from administration routine			Recourse utilization	—	

SOURCE: A20. Administration	ACTIVITY: Routine Operation	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: N/A	
LOCATION: Offices		AREA: Plant I, II, III, & Administration			
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE
e-waste1	<ul style="list-style-type: none"> Toilet waste Papers Carton, empty boxes, plastic bags, tea cups Used cartridges, discarded monitor, printer, CPU Rejected floppies and CDs 				
F20. Use of raw materials and other natural resources	<ul style="list-style-type: none"> Stationeries supplies, insignificant 		<ul style="list-style-type: none"> Resource utilization 	—	NI-116
G20. Use of energy	<ul style="list-style-type: none"> Electricity is used for air conditioning optimization is achieved through planed maintenance 		—	<ul style="list-style-type: none"> Energy conservation 	PI-112
H20. Use of water	<ul style="list-style-type: none"> Mineral water is used for drinking. Municipality water is used in the toilet and this water is recycled for irrigation 		—	<ul style="list-style-type: none"> Good house keeping, gardening around the plant. 	PI-008
I20. Noise, odor, dusts, vibration, and visual impact	<ul style="list-style-type: none"> N/A 		—	<ul style="list-style-type: none"> No impact 	—
J20. Effects on ecosystems	<ul style="list-style-type: none"> Insignificant 		—	<ul style="list-style-type: none"> No impact 	PI-007

K20. Upstream effects—energy, water, raw materials	• N/A	—	• No impact	PI-007
L20. Downstream effects	• N/A	—	• No impact	PI-007
M20. Past effects	• N/A	—	• No impact	PI-007
N20. Future effects	• N/A	—	• No impact	PI-007
O20. Selection test	• N/A	• N/A	• N/A	—
P20. Environmental impact evaluation	• As above	• As above	—	—
Q20. Identification of level of significance	• As follows	• As follows	As follows	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score						Weighting Factor			Remarks				
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply		Factor	Total		
Legislation	Existing Local legislation No. 16 Local information bulletin, Appendix 1, 1.1 Regulation on air pollution control from stationary sources Local legislations No. 5: Oil spill response & prepa-ration. No. 29: Requirements for the discharge of waste gases, fumes and dust to atmosphere. 1.2 Noise control regulation	3	Impending				None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental	2	Limited detrimental		No detrimental None	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Health & safety • Legislation	3	Moderate interest		Little interest		No interest		3×	2	6	<i>c</i>		
Quantity	High	3	Medium		Low	1 1	Nil	0	1×	3	3	<i>d</i>		
Normal operating conditions total = (a + b + c + d)											Total A		15	

B: Ranking of Environmental Effect under other Operating Conditions												
Elements	Conditions/Score									Total		Remarks
	Condition	12	Condition	6	Condition	3	Condition	0				
Abnormal operations	—		Increased environmental impact • Unorganized waste disposal —	6	No change		Reduced environmental impact		6	<i>a</i>		
Accident/ emergency			Increased environmental impact • Accidental fire will lead to release CO ₂ and CO • Health & safety	6	No change		Reduced environmental impact		6	<i>b</i>		
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate		—		No damage No effect		0	<i>c</i>		
Planned activities			Increased environmental impact		No change		Reduced environmental impact • Safe disposal reduced environment pollution	0	0	<i>d</i>		
Other operating conditions total score = (a + b + c + d)									Total B		12	

C: Cost Factor Ranking of Environmental Effects													
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0		
Estimated	N/A		N/A		N/A		N/A	1	N/A		0		
Cost Factor	Total C										0		
FINAL SCORE: = A + B + C											Identification level of significance	27	

Remarks: Yearly orientation of staff to increase safety and environmental awareness

Reviewed by:
(EMS Coordinator)

Signature

Date

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Environmental Aspect Significance Evaluation Matrix

Prepared by: Concerned Manager

SOURCE: A21. Civil Works and Construction	ACTIVITY: Construction	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: Carpentry/Fabrication/ Construction/ Cement Manufacturing			
LOCATION: New Construction		AREA: New Construction Around PP Caps Plant					
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE		
B21. Controlled and uncontrolled emissions to atmosphere	<ul style="list-style-type: none"> • Carpentry works • Wood • Adhesive glues and thinners are used in insignificant amounts • Maintenance workshops; all machines are used with safety precautions • Iron workshop; steel bars are cut for civil construction works • Cement mixing plant is used at the time of construction only • Adequate personnel protective equipments are used 		<ul style="list-style-type: none"> • Health & safety • Fire hazard • Ozone depletion 	—	NI-006 NI-114 NI-007		

SOURCE: A21. Civil Works and Construction	ACTIVITY: Construction	DATE: mm/dd/yyyy	PRODUCT: N/A	SERVICES: Carpentry/Fabrication/ Construction/ Cement Manufacturing		
LOCATION: New Construction		AREA: New Construction Around PP Caps Plant				
ENVIRONMENTAL ASPECT	OTHER INFORMATION		IMPACT -VE	IMPACT +VE	IMPACT CODE	
C21. Controlled and uncontrolled discharges to water	• N/A		—	• No impact	PI-007	
D21. Contamination of land	• N/A		—	• No impact	PI-007	
E21. Solid waste	<ul style="list-style-type: none"> • Concrete • Metal dust • Damage blocks • Steel drums • Wooden scrap • Empty aluminum cans Above materials are sold to local buyers and contractors for recycling		—	• Resources utilization	PI-113	
F21. Use of raw materials and other natural resources	<ul style="list-style-type: none"> • Materials used are converted into finished products • Losses are insignificant 		—	• Resource optimization	PI-113	
G21. Use of energy	• Electrical energy consumption is insignificant		—	• No impact	PI-007	
H21. Use of water	• Insignificant amount is used for cement mixing		—	• No impact	PI-007	
I21. Noise, odor, dust, vibration, and visual impact	<ul style="list-style-type: none"> • Civil works are conducted in open space and noise is insignificant • Housekeeping is satisfactory 		—	• No impact	PI-007	

J21. Effects on ecosystems	<ul style="list-style-type: none"> The overall system is under control and does not lead to major threats to the ecosystem 	—	<ul style="list-style-type: none"> No impact 	PI-007
K21. Upstream effects—energy, water, and raw materials	<ul style="list-style-type: none"> Insignificant 	—	<ul style="list-style-type: none"> No impact 	PI-007
L21. Downstream effects	<ul style="list-style-type: none"> Insignificant 	—	<ul style="list-style-type: none"> No impact 	PI-007
M21. Past effects	<ul style="list-style-type: none"> Insignificant 	—	<ul style="list-style-type: none"> No impact 	PI-007
N21. Future effects	<ul style="list-style-type: none"> Insignificant 	—	<ul style="list-style-type: none"> No impact 	PI-007
O21. Selection test	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	—
P21. Environmental impact evaluation	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above 	<ul style="list-style-type: none"> As above 	—
Q21. Identification of level of significance	<ul style="list-style-type: none"> As follows 	<ul style="list-style-type: none"> As follows 	<ul style="list-style-type: none"> As follows 	—

Key: 0 = Insignificant, 1–20 = Slightly significant, 21–35 = Significant, 36–Max. = Highly significant, PI = Positive impact code, NI = Negative impact.

A: Ranking of Environmental Effects under Normal Operation Conditions														
Elements	Conditions/Score							Weighting Factor			Remarks			
	Condition	3	Condition	2	Condition	1	Condition	0	Multiply	Factor		Total		
Legislation	Existing Local legislation No. 16 Personal Protection Equipment Local information Appendix 1.2 Regulation on air pollution control from stationary source 1.2 Occupational health & safety regulation 1.2 Noise control regulation Local Guidelines No. 25: First Aid No. 52: Metal finishing industry No. 29: Requirement for the discharge of waste gases fumes and dust to the atmosphere No. 6: Industries compound gas cylinders No. 14: Personal protective equipment—Head protection No. 15: Personal protective equipment—Eye & face protection No. 20: Personal protective equipment—Fall protection/safety lines	3	Impending				None	3	3×	2	6	<i>a</i>		
Environmental damage	Known detrimental		Possible detrimental		Limited detrimental		No detrimental None	0	0×	3	0	<i>b</i>		
Interested parties	Considerable interest • Health & safety • Legislation	3	Moderate interest		Little interest		No interest	0	3×	2	6	<i>c</i>		
Quantity	High		Medium		Low Solid waste: Insignificant	1	Nil		1×	3	3	<i>d</i>		
Normal Operating Conditions Total = (a + b + c + d)											Total A	15		

B: Ranking of Environmental Effect under other Operating Conditions											
Elements	Conditions/Score								Total		Remarks
	Condition	12	Condition	6	Condition	3	Condition	0			
Abnormal operations	—		Increased environmental impact —	6	No Change • No change • Unknown	3	Reduced environmental impact	0	3	<i>a</i>	
Accident/ emergency			Increased environmental impact • Threat to health & safety	6	No change		Reduced environmental impact	0	6	<i>b</i>	
Past activities	Evident/ requires action —		Possible damage/difficult to evaluate		—		No damage • No change	0	0	<i>c</i>	
Planned activities			Increased environmental impact		No change	3	Reduced environmental impact • Planned inspection	0	0	<i>d</i>	
Other Operating Conditions Total Score = (a + b + c + d)								Total B		9	

C: Cost Factor Ranking of Environmental Effects													
Elements	Very High	4	High	3	Medium	2	Low	1	None	0	Total	Remarks	
Cost	<1,000,000 US\$		<1,00,000 US\$		<50,000 US\$		<10,000 US\$				0		
Estimated	N/A		N/A		N/A		Applicable <10,000 US\$	1	N/A		1		
Cost Factor	Total C										1		
FINAL SCORE: = A + B + C										Identification Level of Significance		25	

Remarks: Action program required for safety and environmental awareness of employees and resourcing of more safety equipment.

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.3.1
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Attachment no. 4.3.1 (2) A

Product Aspects/Environmental Impacts Analysis (Questionnaire)

Product/Process	Impacts
Tablets	
1. Addition of raw materials <ul style="list-style-type: none"> • Active • Excipients 	Generation of waste: Polybags, steel drums, paper sacks, and aluminum seals
2. Preblending <ul style="list-style-type: none"> • High-speed mixer granulator 	Generation of dust: Human health Close operation: No impact
3. Granulating <ul style="list-style-type: none"> • High-speed mixer granulator 	Close operation: No impact
4. Drying <ul style="list-style-type: none"> • Fluid-bed dryer/Tray dryer 	Close system: No impact
5. Sizing <ul style="list-style-type: none"> • Mill/Sieve 	Dust generation: Human health
6. Addition of raw materials <ul style="list-style-type: none"> • Lubricants • Disintegrants 	Dust generation: Human health
7. Blending <ul style="list-style-type: none"> • Cone blender/drum mixer 	Close system: No impact
8. Tableting <ul style="list-style-type: none"> • High-speed rotary machine 	Dust generation: Human health
9. Blistering	Waste generation: Al, PVC foil, and papers
10. Boxing	Waste generation: Boxes
11. Cartoning	Waste generation: None
12. Shipping	Resource consumption: See separate review

Comments: Waste generation is controlled and handled by local municipality. Dust generated is collected through extraction system and disposed by local municipality. No major impact.

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SOP no.: EMS-4.3.1

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Attachment no. 4.3.1 (2) B

Product Aspects/Environmental Impacts Analysis

Product/Process	Impacts
Capsules	
1. Addition of raw materials <ul style="list-style-type: none"> • Active • Excipients 	Waste generation: Polybags, boxes, and SS drums
2. Aqueous granulating <ul style="list-style-type: none"> • High-speed mixer granulator 	Close operation: No impact
3. Drying <ul style="list-style-type: none"> • Fluid-bed dryer/Tray dryer 	Close operation: No impact
4. Sizing <ul style="list-style-type: none"> • Mill/Sieve 	Dust generation: Human health
5. Addition of raw materials <ul style="list-style-type: none"> • Lubricants • Disintegrants 	Dust generation: Human health Waste generation: Polybags and SS drums
6. Blending <ul style="list-style-type: none"> • Cone blender/drum mixer 	Close operation: No impact
7. Capsulating <ul style="list-style-type: none"> • High-speed capsulation • Machine 	Close operation: No impact
8. Blistering/container filling	Waste generation: Rejected gelatin capsules, P. containers, PVC foil, Al. foil, and papers
9. Boxing	Waste generation: Rejected boxes
10. Cartoning	Waste generation: None
11. Shipping	Refer shipping review

Comments: No major impact on environment or security under control.

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Attachment no. 4.3.1 (2) C

Product Aspects/Environmental Impacts Analysis

Product/Process	Impacts
Powders Suspension	
1. Addition of raw materials • Active • Excipients	Waste generation: Polybags, plastic, and steel drums Dust generation: Human health
2. Sizing • Mill/Sieve	Dust generation: Human health
3. Blending • Cone blender/Drum mixer	Close operation: No impact
4. Filling • Automatic powder-filling machine	Close operation: No impact
5. Capping	Waste generation: Rejected aluminum caps, rejected dosing cup plastic, and rejected glass bottles
6. Boxing	Waste generation: Boxes and cartons
7. Cartoning	Waste generation: boxes and cartons
8. Shipping	Refer shipping review

Comments: No major impact or security under control.

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Attachment no. 4.3.1 (2) D

Product Aspects/Environmental Impacts Analysis

Product/Process	Impacts
Syrups, Suspensions, and Drops	
1. Addition of raw materials <ul style="list-style-type: none"> • Active • Nonactives 	Waste generation: Polybags, plastic, and Steel drums Dust generation: Human health
2. Mixing <ul style="list-style-type: none"> • Jacketed vessel with variable • Speed mixer 	Closed operation: No impact
3. Filtration <ul style="list-style-type: none"> • Filter press/Cartridge filter/ Nylon filter 	Closed operation: No impact: Only accidental spillage
4. Filling <ul style="list-style-type: none"> • Automatic filling machine 	Close operation: No impact
5. Capping	Rejected caps and dosing cups (Plastic)
6. Boxing	Rejected boxes
7. Cartoning	Rejected cartons
8. Shipping	Refer shipping review

Comments: No major impact.

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Attachment no. 4.3.1 (2) E

Product Aspects/Environmental Impacts Analysis

Product / Process	Impacts
Cream, Ointment, and Suppositories	
1. Addition of raw materials	
<ul style="list-style-type: none"> • Active • Nonactives 	Waste generation: Polybags, plastic, and steel drums Dust generation: Human health
2. Mixing	
<ul style="list-style-type: none"> • Jacketed vessel with a variable speed mixer 	Closed operation: No impact
3. Filling	
<ul style="list-style-type: none"> • Automatic filling machine 	Closed operation: No impact
4. Boxing	Rejected boxes
5. Cartoning	Rejected cartons
6. Shipping	Refer shipping review

Comments: No major impact.

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Attachment no. 4.3.1 (2) F

Product Aspects/Environmental Impacts Analysis

Product/Process	Impacts
Aseptic Fill Products	
1. Issuance of raw and packaging material	No impact
2. Addition of raw materials	
• Active	Closed system: No impact
• Nonactives	
3. Medium	
• Water for injection	No impact
4. Steam sterilization	
• Pressure vessel/filling and filtration assembly/stopper and seals/gowning	No impact. Only accidental vessel pressure failure, human health
5. Mixing	
• Pressure vessel	No impact
6. Ampoules/vials	
• Washing	Broken glass ampoules/vials
7. Ampoules/vials	
• Hot air sterilization	Broken vials and ampoules (glass)
8. Filtration	
• Filtration assembly and a 0.22 µm filter	No impact
9. Aseptic filling	
• Automatic filling and sealing machine	No impact. Only rejected aluminum seals
• In-line filtration	
• Gassing	
10. Leak test	Rejected ampoules/vials (glass)
11. Inspection of filled	
• Ampoules/vials	Rejected ampoules/vials
12. Labeling/Packing	Rejected boxes and leaflets
13. Shipping	Refer shipping review

Comments: No major impact.

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Attachment no. 4.3.1 (2) H

Product Aspects/Environmental Impacts Analysis

Product/Process	Impacts
Lyophilized products	
1. Issuance of raw and packaging material	No impact
2. Addition of raw material <ul style="list-style-type: none"> • Active • Nonactive 	Closed system
3. Medium <ul style="list-style-type: none"> • Water for injection 	No impact
4. Steam sterilization <ul style="list-style-type: none"> • Pressure vessel • Filling and filtration assembly • Gowning 	No impact
5. Mixing <ul style="list-style-type: none"> • Pressure vessel 	No impact
6. Ampoules/vials <ul style="list-style-type: none"> • Washing 	Broken vials and ampoules (few)
7. Vials/Sterilization/Depyrogenation through dry heat sterilizer	Broken vials and ampoules (few)
8. Stopper and caps sterilization through steam sterilizer	No impact
9. Filtration <ul style="list-style-type: none"> • Filtration assembly and a 0.22 µm filter 	No impact
10. Aseptic filling <ul style="list-style-type: none"> • Automatic filling • In-line filtration • Gassing • Partial stoppering • Shelf loading 	No impact: Only rejected aluminum seals
11. Lyophilization <ul style="list-style-type: none"> • Freezing • Sublimation • Freeze drying • Full stoppering 	No impact

Product/Process	Impacts
12. Vial sealing	No impact
13. Inspection of filled vials	No impact
14. Labeling/Packing	Rejected boxes and labels
15. Shipping	No impact

Comments: No impact.

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Attachment no. 4.3.1 (2) I

Product Aspects/Environmental Impacts Analysis

Product/Process	Impacts
Ready-to-Use Disposable Syringes	
1. Issuance of raw and packaging material	No impact
2. Addition of raw material	Closed system
<ul style="list-style-type: none"> • Active • Nonactive 	
3. Medium	No impact
<ul style="list-style-type: none"> • Water for injection 	
4. Steam sterilization	No impact
<ul style="list-style-type: none"> • Pressure vessel • Filling and filtration assembly • Gowning 	
5. Mixing	No impact
<ul style="list-style-type: none"> • Pressure vessel 	
6. Sterile syringes	No impact
7. Filtration	No impact
<ul style="list-style-type: none"> • Filtration assembly and a 0.22 µm filter 	
8. Aseptic filling	No impact; Only rejected syringes
<ul style="list-style-type: none"> • Automatic syringe filling • Stoppering machine • In-line filtration • Gassing 	
9. Leak test	No impact
10. Inspection of filled syringes	No impact
11. Plunger rod assembly	No impact
<ul style="list-style-type: none"> • Blister packing 	
12. Boxing	Rejected boxes and leaflets
13. Shipping	No impact

Comments: No impact.

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SOP no.: EMS-4.3.1
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Attachment no. 4.3.1 (3) A

Activities Aspects/Environmental Impacts Analysis

Activities	Impacts
Administration Operations	
1. Kitchen	Disposable glasses and boxes
2. Paper work	Paper waste
3. Cartons	Empty boxes
4. Empty boxes	Waste
5. Printing cartridges	Plastic waste, recycling opportunity

Comments: The impact is waste generation, which may be controlled and disposed for recycling.

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SOP no.: EMS-4.3.1
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Attachment no. 4.3.1 (3) C

Activities Aspects/Environmental Impacts Analysis

Activities	Impacts
Product Development Laboratory	
1. Papers	Waste generation: Nature
2. Rejected raw materials	Land pollution and sea pollution: Human health
3. Rejected stability samples	Land and sea pollution: Human health
4. Rejected finished products	Land and sea pollution: Human health
5. Washings from the lab	Land and sea pollution: Human health
6. PVC foil	Material assets: Resources
7. Aluminum foil	Material assets: Resources
8. Glass bottles	Material assets
9. Solvents	Chlorinated—ozone depletion
	Nonchlorinated—land and sea
10. Chemicals	Land and sea

Comments: Paper shall be disposed off for recycling; rejected material should be handed over to local municipality for disposal. The waste water should be recycled. Chlorinated solvents and other items, that is, glass bottles, PVC foil, and aluminum foil should be disposed by local municipality.

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Attachment no. 4.3.1 (3) D

Activities Aspects/Environmental Impacts Analysis

Activities	Impacts
Maintenance Workshop	
• Mechanical/fabrication	Natural resources: human health
• Rejected steel bars	Natural resources: human health
• Rejected steel plates	Natural resources
Electrical	
• Damage cables	Natural resources
• Used oil	Land and sea
• Used batteries	Land and sea, and air
Air-Conditioning	
• Rejected isolation	Human
• Rejected filters	Resources
• Damage ductings	Resources
Water Treatment Plant	
• Empty plastic drums	Resources

Comments: Batteries should be sent for recycling. General waste should be sold for recycling where possible. The items dangerous for humans should be disposed off by local municipality.

Reviewed by:
 (EMS Coordinator)

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SOP no.: EMS-4.3.1
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Attachment no. 4.3.1 (3) E

Activities Aspects/Environmental Impacts Analysis

Activities	Impacts
Kitchen	
1. Gases	Air pollution, human health
2. Used oil	Land and sea
3. Junk food	Human health
4. Disposable kitchen items	Natural resources

Comments: The above impacts are dependent on consumption quantities. SOP will be written to adopt good practices and optimal utilization of resources. Oil should be disposed in a container to local municipality or the drums should be buried in an isolated land away from natural resources of potable water.

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Attachment no. 4.3.1 (3) F

Activities Aspects/Environmental Impacts Analysis

Activities	Impacts
Kitchen	
1. Cartons	Natural resources
2. Plastic bags	Ozone depletion, sea pollution
3. Rejected wooden pallets	Natural resources, fire hazard
4. Disposable head and shoe covers	Ozone depletion, sea and land pollution

Comments: Waste generation should be minimized. Plastic bags should be sent for recycling if possible. Ozone depletion items should be minimized.

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SOP no.: EMS-4.3.1
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Initials: _____

Attachment no. 4.3.1 (3) G

Activities Aspects/Environmental Impacts Analysis

Activities	Impacts
Civil Department	
1. Carpentry	
• Wooden scrap	Resources utilization, fire hazard
• Empty cans of solvents	Resources utilization
• Empty cans of thinners and paints	Ozone depletion
• Empty boxes	Resources utilization
2. Fabrication	
• Rejected steel bars	Resources utilization
• Rejected steel drums	Resources utilization
• Metallic dust	Human health
3. Construction site	
• Empty cans of thinner & paint	Ozone depletion
• Wooden scrap	Fire hazard, natural resources
• Metallic scrap	Resource utilization
4. Cement mixing plant	
• Broken blocks	Landscape
• Damage concrete	Landscape
• Disposable gloves	Waste generation
• Empty boxes	Natural resources utilization

Comments: Waste generation should be minimized where possible. Environmental-friendly solvents should be preferred. Waste should be adequate to arrange recycling.

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Initials: _____

Attachment no. 4.3.1 (3) H

Activities Aspects/Environmental Impacts Analysis

Activities	Impacts
Plastic Dosing Cups Plant	
1. Plastic raw material from supplier (injection molding grade)	Storage: Accidental fire hazard only
2. Raw material mixing	Closed operation: No impact
3. Raw material loading	Closed operation: No impact
4. Injection molding	Closed operation: No impact
5. Scrap grinding	Dust generation: Human health, air pollution
6. Inspection	No impact (rejected waste)
7. Packing into polybag lined carton	No impact

Comments: No major impact. Human health is protected through good practices and adequate extraction system.

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SOP no.: EMS-4.3.1
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Attachment no. 4.3.1 (3) I

Activities Aspects/Environmental Impacts Analysis

Activities	Impacts
Aluminum Caps Plant	
1. Aluminum sheet from supplier	No impact
2. Guillotine shear	No impact
3. Gang slitter	Metal dust
4. Power press	No impact
5. Separator	No impact
6. Inspection conveyor	Rejected aluminum caps
7. Knurling and scoring	No impact
8. Wadding	No impact
9. PE liner from supplier	No impact
10. Packaging into polybag-lined cartons	No impact

Comments: No major impact. Operators are controlled.

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Attachment no. 4.3.1 (3) J

Activities Aspects/Environmental Impacts Analysis

Activities	Impacts
Stores	
1. Wooden pallets	Waste generation
2. Steel drums	Waste generation
3. Polybags	Waste generation
4. Plastic drums	Waste generation
5. Plastic ropes	Waste generation
6. Metal clips	Waste generation

Comments: No major impact.

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SOP no.: EMS-4.3.1

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Initials: _____

Attachment no. 4.3.1 (3) K

Activities Aspects/Environmental Impacts Analysis

Activities	Impacts
Electricity Generator	
1. Transformer	Human health: (CO ₂ , CO, nitrogen, and carbon compounds)
2. Oil disposal	Health, land, and sea
3. Circuit breaker	Human health
4. Fuel tank (diesel)	Land and human health (emergency only)
5. Oil disposal	Human health and land
6. Batteries	Human health

Comments: Very minimal impact. No major impact. Energy conservation is more desirable.

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SOP no.: EMS-4.3.1

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Initials: _____

Attachment no. 4.3.1 (4) A

Services Aspects/Environmental Impacts Analysis

Activities	Impacts
Shipping	
1. Land	Accidental land pollution
2. Sea	Accidental sea pollution
3. Air	Accidental land or sea pollution or air pollution
Comments: <u>No major impact. Local regulatory bodies are responsible for handling the pollution.</u>	

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Attachment no. 4.3.1 (4) B

Services Aspects/Environmental Impacts Analysis

Activities	Impacts
Sewage Treatment Plant	
Collection Tank	
1. Plant I 2. Plant II 3. Plant III 4. Hosing 5. PP cap 6. Aluminum cup 7. Administration 8. Maintenance	Bad odor, human health, accidental overflow, ground and land pollution, air pollution
Continuous Aeration Tank (2)	
1. Settling tank (decontaminate) 2. Filtration cartridge 3. Buffer tank 4. Sand filter 5. Contamination 6. Storage 7. Irrigation	Accidental overflow, bad odors, human health Accidental overflow, bad odors, human health Accidental overflow, land pollution Accidental overflow, land pollution Accidental overflow, land pollution Distribution for irrigation Gardening and plantation

Comments: No major impact, under control.

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SOP no.: EMS-4.3.1
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Attachment no. 4.3.1 (5) A

Environmental Aspects/Impacts Analysis of Products/ Activities/Services (Rating)

Activity	Impacts
1. Air conditioning	The average overall ranking is 116, indicating the highest priority; however, the highest rank is attributed due to the biological waste from the QC lab. Operations are under the control
2. Electricity generation	
3. Sewerage treatment plant	
4. Stores	
5. Aluminum caps plant	
6. Plastic dosing caps plant	
7. Catering services	
8. Maintenance	
9. Civil works	

Comments: No major impact.

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_____ Signature

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SOP no.: EMS-4.3.1
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Attachment no. 4.3.1 (5) B

Environmental Aspects/Impacts Analysis of Products/ Activities/Services (Rating)

Services	Remarks
1. Shipping	Rank is 72. Very much under the control operation
2. Sewage treatment plant	Ranking is 115, as the pollution of land and sea will adversely affect nature and human beings and sea life

Comments: However, the sewage treatment plant is working at its optimum, that is, 100% recycling of waste water.

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Attachment no. 4.3.1 (5) C

Environmental Aspects/Impacts Analysis of Products/ Activities/Services (Rating)

Products	Remarks
1. Tablets	
2. Capsules	
3. Powders suspension	
4. Syrups, suspension, and drops	
5. Cream, ointment, and suppositories	
6. Aseptic fill products	Priority ranking is 55
7. Terminally sterilized products	
8. Lyophilized products	
9. Tablets	
10. Ready-to-use disposable syringes	

Comments: No major impact.

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SOP no.: EMS-4.3.2
 Issue date: mm/dd/yyyy
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 Initials: _____

Attachment no. 4.3.2 (1)

Aspects/Regulatory Requirement Review/Priority

Activity/ Products/ Services and Aspects	Types of Impacts	How Disposed	RAK Legislation	Federal Legislation	Dubai Municipality Legislation	Remarks	Priority Marking
Attachment no. 4.3.1 (3) A to 4.3.1 (3) K Attachment no. 4.3.2 (2) A to 4.3.1 (2) I	Waste 1. Cafeteria junk food 2. Broken bottles 3. Disposable shoe and head covers 4. Disposable kitchen items 5. Rejected raw materials 6. Rejected finished products 7. Damage PVC roll 8. Metallic dust 9. Gardening waste 10. Biological waste	Local municipality	Not available	Not available	Available and adopted as best practice where possible	EMS compliance	1

Activity/ Products/ Services and Aspects	Types of Impacts	How Disposed	RAK Legislation	Federal Legislation	Dubai Municipality Legislation	Remarks	Priority Marking
	Energy Conservation 11. Electric 12. Water	Optimization recycling	Not available	Not available	Best practice adopted	EMS compliance	2
Attachment no. 4.3.1 (4) A to 4.3.1 (4) B Attachment no. 4.3.1 (5) A to 4.3.1 (5) C	Other Wastes 13. Kitchen oil (used) 14. Transformer oil (used) 15. Chemical dust 16. Ozone-depleting solvents 17. Total liquid waste 18. Batteries (used) 19. Smoke detector sensors (used) 20. Sewage sludge 21. Accidental fire 22. Human health	Local municipality Sewage treatment plant Local municipality Emergency preparedness personal safety equipment provided	Not available	Not available	Available and adopted as best practice where possible	EMS compliance	3

Attachment no. 4.3.1 (3) A to 4.3.1 (3) K	Scrap Not for Sale 23. Plastic waste 24. Cartons 25. Empty boxes	Local contractor	Not available	Not available	Available and adopted as best practice where possible	EMS compliance	4
Attachment no. 4.3.2 (2) A to 4.3.1 (2) I	Scrap for Sale 26. Empty plastic drums 27. Empty steel drums 28. Rejected wooden pallets 29. Aluminum scrap	Local buyers	Not available	Not available	Available and adopted as best practice where possible	EMS compliance	5
Attachment no. 4.3.1 (4) A to 4.3.1 (4) B	Scrap for Destruction 30. Broken blocks 31. Damage concrete 32. Wooden scraps	Local dumping sites, land fills	Not available	Not available	Available and adopted as best practice where possible	EMS compliance	6
Attachment no. 4.3.1 (5) A to 4.3.1 (5) C	Reusable Scrap 33. Steel bars 34. Steel plates 35. Electrical cables 36. Ducting 37. Pipes	Company scrap area	Not available	Not available	Available and adopted as best practice where possible	EMS compliance	7

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.3.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.3.2 (2)

Objectives Established and Reviewed

Copy to: Concerned Responsible

Significant Aspect Identified	Impact Rating	Objective	Impact	Target	Indicator	Limit	Policy	Prepared by Concerned Manager
Activities <ul style="list-style-type: none"> • Air conditioning • Electric generator • Water treatment Plant • Manufacturing • Packaging • Storage 								

Reviewed by: _____
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.3.2
 Issue date: mm/dd/yyyy
 Revision no.: New
 Initials: _____

Attachment no. 4.3.2 (3)

Other Examples of Significance Assessment Model

By: Concerned Manager

Criteria	3 Points	2 Points	1 Point
Regulation	Consistent regulatory noncompliance	Stricter regulatory requirements have been announced Temporary regulatory noncompliance	Used according to regulatory requirements No tightening of requirements is foreseen
Public opinion (internal and external)	The substance is subject to continual criticism by media and the public (despite regulatory compliance)	Independent experts call for stricter regulatory requirements	The substance is not subject to criticism
Economic criteria (material, waste, and scrap)	Use of the substance generates significant losses of material	Use of the substance generates medium-size losses of material	Hardly any material losses
Quantity	Significant quantity or level	Medium quantity or level	Small or very small quantity or level
Ecological criteria	Use of the substance generates environmental impact throughout the production	Use of the substance generates environmental impact in some steps of the production process	No significant environmental impact during production

Remarks: Refer, details attached

Reviewed by: _____ **(EMS Coordinator)** _____ **Signature** _____ **Date**

SOP no.: EMS-4.3.2
 Issue date: mm/dd/yyyy
 Revision no.: New

Attachment no. 4.3.2 (5)

Example of an Environmental Flow Chart

Demolition of buildings

Quantities/Levels
 (to be filled in by the facility)

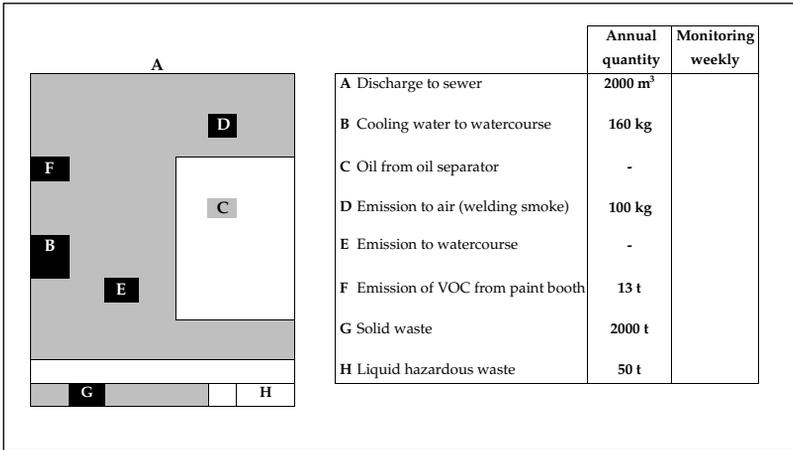
Inputs / Aspects	Manufacturing Process	Output / Aspects	Normal Operation	Abnormal operation	Costs	Requirements	Monitoring	Emergency risks
Sheet iron fittings acetylene gas Nitrogen gas water	Cutting	Water/sludge Emissions (smoke) Scrap Dust Noise						
↓								
Cutting oil Machine oil	Machining - Grinding - Milling - Drilling - Bending	Water Scrap Lubricants Noise						

Remarks: _____

Reviewed by: _____
(EMS Coordinator)
Signature
Date

Attachment no. 4.3.2 (6)

Example of Discharges from a Manufacturing Facility



Attachment no. 4.3.3 (1) A

Objectives and Targets

Product/Activity/Services: Waste water treatment plant

Policy (P)

P1: Virtual Pharmaceutical Industries will conserve the natural resources of water through recycling and optimization of consumption where technically and practically possible.

Objectives and Targets (OT)

OT1A: Complete the installation and operation of the waste water treatment plant by mm/dd/yyyy to achieve 100% recycling of waste water.

OT1B: The quality of recycled water should meet the specification of irrigation water in accordance with local legislation.

OT1C: The recycled water should be 100% utilized for gardening by mm/dd/yyyy.

OT1D: 100% utilization of recycled water for irrigation from plant JI, JII, and JIII by mm/dd/yyyy through installation of an automatic sprinkler system to achieve optimization.

OT1E: 100% recycling of waste water discharged from new administration building subject to its start-up, expected by mm/dd/yyyy.

OT1F: Use of irrigation water in decoration fountains if in compliance with the USP potable water specification by mm/dd/yyyy.

Action program (AP)

Refer, program AP1.

Reviewed by: _____
(EMS Coordinator) Signature Date

Attachment no. 4.3.3 (1) C

Objectives and Targets

Product/Activity/Services: Burning of diesel (electricity generation)

Policy (P)

P3: Virtual Pharmaceutical Industries will seek measures to reduce 20% of its electrical energy consumption by mm/dd/yyyy.

Objectives and Targets (OT)

OT3A: Achieve 20% electrical energy saving for plant I by mm/dd/yyyy through correction of the phase angle to $380\text{ V} \pm 10$.

OT3B: Achieve 20% electrical energy saving for plant I, II, III, and workshops through correction of the phase angle to $380\text{ V} \pm 10$ by mm/dd/yyyy.

OT3C: Achieve 20% electrical energy saving through correction of the phase angle to $380\text{ V} \pm 10$ for Digdaga substation and housing by mm/dd/yyyy.

OT3D: Monitoring and control of CO_2 , CO, and nitrogen compounds in accordance with local legislation by mm/dd/yyyy.

Action Program (AP)

Refer, program AP3.

Reviewed by: _____
(EMS Coordinator) Signature Date

Attachment no. 4.3.3 (1) E

Objectives and Targets

Product/Activity/Services: Plastic caps and dosing cups manufacturing plant

Policy (P)

P5: Virtual Pharmaceutical Industries will encourage the recycling of plastic waste through continuous awareness programs for the staff and the customers.

Objectives and Targets (OT)

OT5A: Quantify the dosing cups produced in 1998, 1999, and 2000 to see the impact by mm/dd/yyyy.

OT5B: Evaluate the countries of significance importance by mm/dd/yyyy.

OT5C: Prepare a public awareness program on yearly basis for safe disposal of dosing cups and encourage recycling.

Action Program (AP)

Refer, program AP5.

Reviewed by: _____
(EMS Coordinator) Signature Date

Attachment no. 4.3.3 (1) F

Objectives and Targets

Product/Activity/Services: Aluminum caps manufacturing plant

Policy (P)

P6: Virtual Pharmaceutical Industries will reduce and encourage the safe disposal and recycling of aluminum waste through continuous customer awareness program.

Objectives and Targets (OT)

OT6A: Quantification of annual consumption of aluminum in 2004, 2005, and 2006 by mm/dd/yyyy.

OT6B: Preparation of priority countries listing the distribution by mm/dd/yyyy.

OT6C: Staff and customers awareness program for safe disposal of aluminum caps and encourage recycling on continuous basis.

Action Program (AP)

Refer, program AP6.

Reviewed by: _____
(EMS Coordinator) Signature Date

Attachment no. 4.3.3 (1) G

Objectives and Targets

Product/Activity/Services: Transportation (administration)

Policy (P)

P7: Virtual Pharmaceutical Industries will reduce the impact of its transport operations by maximizing the efficiency of routes and optimization of vehicles maintenance and awareness programs for the drivers.

Objectives and Targets (OT)

OT7A: Provide training to the drivers on good driving skills and techniques to reduce nitrogen oxide emission by 20%, while reducing fuel consumption by an average of 15% by mm/dd/yyyy.

OT7B: Achieve 2% reduction in fuel consumption through managing routine services and check-up by mm/dd/yyyy.

OT7C: 10% reduction in consumption of petrol with lead by mm/dd/yyyy.

Action Program (AP)

Refer, program AP7.

Reviewed by: _____
(EMS Coordinator) **Signature** **Date**

Attachment no. 4.3.3 (1) H

Objectives and Targets

Product/Activity/Services: Laundry

Policy (P)

P8: Virtual Pharmaceutical Industries will adopt means and ways to manage the disposal of hazardous substances and minimize their consumption where possible.

Objectives and Targets (OT)

OT8A: Reduce the consumption of hazardous cleaning agents (used in laundry) by 5% by mm/dd/yyyy as compared to mm/dd/yyyy.

Action Program (AP)

Refer, program AP8.

Reviewed by: _____
(EMS Coordinator) Signature Date

Attachment no. 4.3.3 (1) I

Objectives and Targets

Product/Activity/Services: Kitchen

Policy (P)

P9: Virtual Pharmaceutical Industries will educate, train, and motivate employees to carry out their tasks in an environmentally responsible manner.

Objectives and Targets (OT)

OT9A: 100% training of kitchen staff to be in compliance with health & safety requirement of local legislation health & safety in food preparation areas by mm/dd/yyyy.

Action Program (AP)

Refer, program AP9.

Reviewed by: _____
(EMS Coordinator) Signature Date

Attachment no. 4.3.3 (1) J

Objectives and Targets

Product/Activity/Services: Processing/Tablets/Capsules/Powders/Semisolids/Liquids and sterile products

Policy (P)

P9: Virtual Pharmaceutical Industries will educate, train, and motivate employees to carry out their tasks in an environmentally responsible manner and prevent pollution.

Objectives and Targets (OT)

OT10A: Conduct training for all staff members by mm/dd/yyyy.

- Health & safety
- Pollution prevention

Action Program (AP)

Refer, action program AP10.

Reviewed by: _____
(EMS Coordinator) Signature Date

Attachment no. 4.3.3 (1) K

Objectives and Targets

Product/Activity/Services: QC and PDL

Policy (P)

P10: Virtual Pharmaceutical Industries will reduce the amount of waste resulted from its operations. We will minimize the use of materials, design, and modify operations to minimize waste generation where possible.

Objectives and Targets (OT)

OT11A: 5% reduction in the use of chlorinated solvents (ODs) in year (yyyy) as compared with year (yyyy) in QC and PDL laboratory.

OT11B: 10% reduction in the use of volatile organic solvents in year (yyyy) as compared to year (yyyy) in QC and PDL laboratory.

OT11C: Construction of a new QC laboratory and Product Development Laboratory in compliance with the International Safety Rules and environmental requirements of United Arab Emirates by year (yyyy).

OT11D: 5% reduction in QC and PDL laboratory waste generation in year (yyyy) as compared to year (yyyy).

Action Program (AP)

Refer, program AP1.

Reviewed by: _____
(EMS Coordinator) Signature Date

Attachment no. 4.3.3 (1) M

Objectives and Targets

Product/Activity/Services: Stores

Policy (P)

P11: Virtual Pharmaceutical Industries will periodically conduct environmental system audits based on ISO 14001 to continually improve our environmental performance.

Objectives and Targets (OT)

OT12A: Prepare store inspection program by mm/dd/yyyy.

OT12B: Establish a list of safety equipment and their procurement by mm/dd/yyyy.

OT12C: Review of 100% materials safety data sheets (MSDS) by mm/dd/yyyy.

OT12D: 100% availability of MSDS in stores, weighing area, production, and QC laboratory by mm/dd/yyyy.

Action Program (AP)

Refer, program AP12.

Reviewed by: _____
(EMS Coordinator) _____ _____
Signature Date

Attachment no. 4.3.3 (2)

Targets Established and Reviewed

Copy to: Concerned Responsible

Significant Aspect Identified	Impact Rating	Objective	Impact	Target	Indicator	Limit	Policy	Prepared by Concerned Manager
Product/ Process tablets ^a	Air pollution (powder dust)	Prevent dust dispersion in air	-Employees health -Air pollution	Dust dispersion in the air	Swabs from the plant exhaust show negative results for the chemicals processed inside the plant	0	Prevent generation of dust due to powder operations inside the plant	Production manager

^a For details, refer enclosed report.

Reviewed by:
(EMS Coordinator)

Signature

Date

Attachment no. 4.3.3 (3)

Aspects/Impacts/Objectives and Targets Review

Copy to: Concerned Responsible

Significant Aspect Identified	Impact Rating	Objective	Impact	Target	Indicator	Limit	Policy	Prepared by Concerned Manager
Services • Transportation ^a	10	Yes	-Ozone depletion -Air pollution	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Transportation manager Transportation manager

^a For details, refer enclosed report.

Reviewed by:

(EMS Coordinator)

Signature

Date

Attachment no. 4.3.4 (1)

Environmental Management Program

Copy to: Concerned Responsible

Policy no.

1.	Policy statement, e.g., Minimize water use whenever technically and commercially feasible.							
2.	Description of objective, e.g., Reduce water consumption at selected sites by 50,000 m ³ from present level within one year.							
3.	Description of target, e.g., Carry out a program if investigations to measure the use of water at different parts of process are needed. Install the necessary equipment to tackle the worst three users by October next year.							
4.	Summary : As above							
	Aspect	Environmental impact	Legal nonconform	Internal standard nonconform	Severity	Priority	Location	Refer to site plan
	Natural sweet water	Wastage of natural resources	None	None	Medium	Medium	Process assembly	Drawing No. 1

5.	Program, e.g., install equipment to recycle rinse water for process "A" for reuse in process "B" by (Objective) October next year to be carried out by the production manager.				
	Target	How (Means)	Responsibility	When	Achieved on
	March 2000	Process review	Production	February 2000	
6.	Monitoring:				
	Target	Indicator	Frequency	Responsibility	Refer Record
	April 2000	Water consumption	Weekly	Production	Production File
7.	Cost and investment				
	Target	Internal cost	External cost	Savings	Return
	October 2000	US\$50,000	US\$200,000	US\$50,000	25% / year
8.	Follow-up • Objective achieved : _____ YES _____ Date : _____ mm/dd/yyyy _____ • Time frame respected _____ YES _____ Date : _____ mm/dd/yyyy _____ • Corrective action: _____ NONE _____ Date : _____ mm/dd/yyyy _____ • Comments: _____ Satisfaction, policy in compliance _____ _____ _____				

Reviewed by: _____
 (EMS Coordinator) Signature Date

SOP no.: EMS-4.4
Issue date: mm/dd/yyyy
Revision no.: New

Attachment no. 4.4 (1)

Personnel and Responsibilities

Copy to: Concerned Responsible

Sample Environmental Responsibilities	Typical Person(s) Responsible
Establish overall direction	General manager, chief executive officer (CEO), and board of directors
Develop environmental policy	President and chief environmental management system controller
Develop environmental objectives, targets, and programs	Relevant managers
Monitor overall EMS performance	Environmental system coordinator
Assure regulatory compliance	Senior operating manager
Ensure continual improvement	All managers
Identify customers expectations	Sales and marketing staff
Identify suppliers expectations	Purchasers and buyers
Develop and maintain accounting procedures	Finance/account managers
Comply with defined procedures	All staff

Note: In the case of SMEs, the person responsible can be the owner.

Reviewed by:

(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.4

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4 (2)

Structure and Responsibility Example

To: Person Concerned

From: Concerned Manager

Job Title: EMS coordinator Reporting to: General manager
 Department: Engineering Qualification: B.Sc. Environmental Science
 Summary (Job Title): Maintain, monitor, and control the elements of EMS

Responsibilities

1. Maintain a list of environmental aspects, in particular the significant environmental aspects.
2. Maintain a list of environmental training records.
3. Keep records of proposals for new environmental objectives.
4. Follow-up the progress toward environmental objectives.
5. Coordinate and maintain the process for regular identification and updating of environmental objectives and targets.
6. Maintain contacts with governmental authorities.
7. Prepare the documentation necessary for the management reviews.
8. Report on environmental management at the management review meetings.
9. Coordinate EMS audits.
10. Consolidate environmental reports, for example, to authorities.
11. Prepare the environmental statement if the facility is registered to EMAS.
12. Report on regulatory compliance to top management.
13. Prepare documents needed for the management review meetings.

Authorization

Authorized to stop any activity, product, or services not in compliance with the environmental protection.

Approved by: _____ Accepted by: _____

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.4

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4 (3)

Resources Allocation

To: Concerned Manager

From: Personnel Manager

Policy No.: P1
1. Personnel Resources <ul style="list-style-type: none"> • Job title: Utilities manager • Personnel qualification: Chemical engineer • Practical experience: Ten years • Training received: Yes • Computer awareness: Yes • Personnel character: Good
2. Financial Resources (Provide details): <ul style="list-style-type: none"> • Equipment cost: 100,000 US\$ • Personnel cost: 26,000 US\$
3. Redirection of Existing Personnel <p style="text-align: center;">Yes</p>
4. Training Requirements <p style="text-align: center;">No</p>
5. Benefits for the Company <ul style="list-style-type: none"> - No training expenses - No new recruitment
6. Personnel Motivation <p style="text-align: center;">Yes</p>

Reviewed by: (EMS Coordinator)	Signature	Date
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Approved by: (General Manager)	Signature	Date
--	-----------	------

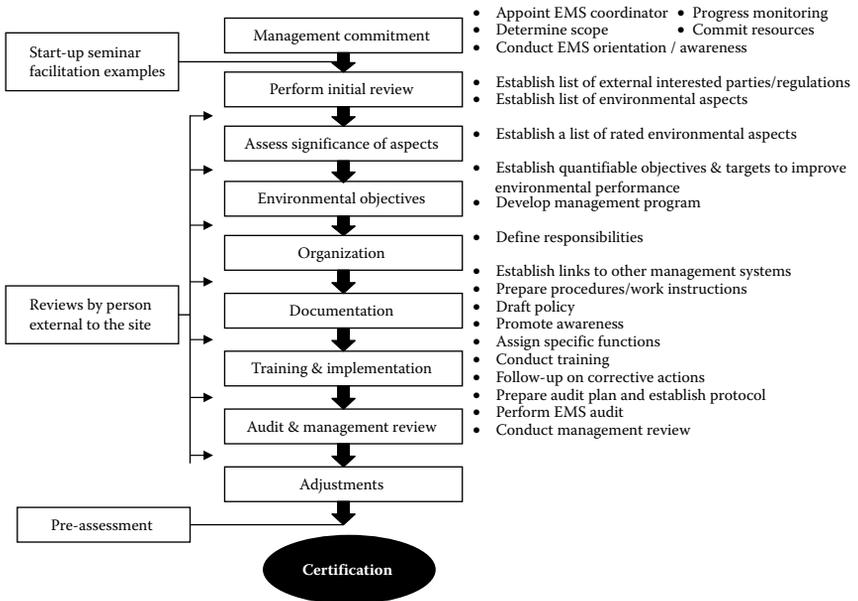
SOP no.: EMS-4.4

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4 (4)

General Implementation Process



SOP no.: EMS-4.4

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4 (5)

Example Job Description of EMS Coordinator

The list contains examples of the ISO 14001 elements that usually the EMS coordinator (or any other person who has been given the responsibility to document the EMS) is responsible for.

Issue	Activity/Responsibility
<i>Policy</i>	<ul style="list-style-type: none"> • Coordinate the establishment of a site-specific environmental policy that is relevant to the facility's size and activities. • Ensure that the local environmental policy is in line with the company policy for environmental protection. • Ensure that the local environmental policy fulfills the requirements of ISO 14001, e.g., it shall contain commitments to continual improvement and compliance with relevant environmental legislation. • Document the procedure for the environmental policy.
<i>Environmental aspects</i>	<ul style="list-style-type: none"> • Coordinate and document the initial review. This process can be more or less comprehensive depending on how well the processes are documented. • Develop a site-specific model for how to assess the significance of the environmental aspects. • Document the procedure for identifying environmental aspects.
<i>Legal requirements</i>	<ul style="list-style-type: none"> • Ensure that the organization has procedures for regular updating of relevant regulatory requirements. • Establish a list of how the legal requirements are applied to the organization, i.e., a list containing the laws and the environmental aspects, e.g., emissions, where laws are applicable to the organization.
<i>Environmental objectives</i>	<ul style="list-style-type: none"> • Establish a list of environmental objectives and programs that have recently been completed. • Establish procedures for how to identify environmental objectives and programs within all relevant functions of the organization. • Establish a list of ongoing environmental objectives and programs. • Document the procedure for setting environmental objectives.
<i>Environmental programs</i>	<ul style="list-style-type: none"> • Confirm that all environmental objectives have programs setting out how the objective and targets are to be achieved. • Document the procedure for environmental programs.

Issue	Activity/Responsibility
<i>Environmental organization</i>	<ul style="list-style-type: none"> • Identify activities and functions that may have a significant impact on the organization’s environmental performance. • Delegate responsibilities.
<i>Education & training</i>	<ul style="list-style-type: none"> • Ensure that functions needing special education and training are identified. • Identify training requirement for functions that may have a significant environmental impact. • Coordinate EMS general training. • Coordinate function specific training. • Establish procedure for retaining of training records.
<i>Communication</i>	<ul style="list-style-type: none"> • Ensure that the environmental policy and the significant environmental objectives are communicated to the whole organization. • Coordinate formal delegation of environmental responsibilities and authorities. • Establish the procedure for external and internal communication
<i>EMS documentation</i>	<ul style="list-style-type: none"> • Describe the elements of the EMS, e.g., types of documents. • Describe the organization and its environmental aspects. • Maintain the EMS documentation, i.e., regular updating.
<i>Document control</i>	<ul style="list-style-type: none"> • Establish a procedure for document control, e.g., refer to the corresponding procedure within the quality system. • Establish a list of environmental documents and the recipients of documents.
<i>Processes</i>	<ul style="list-style-type: none"> • Implement procedures for regular updating of environmental aspects, e.g., environmental aspects of new or significantly modified manufacturing processes and new product lines. • Identify and list all processes that need to have documented procedures in order to control their environmental impacts. • Coordinate the documentation of procedures and instructions.
<i>Emergency</i>	<ul style="list-style-type: none"> • Coordinate an inventory of potential emergency situations. • Establish procedures for how to train emergency situations. • Document the procedure for emergency control.
<i>Monitoring</i>	<ul style="list-style-type: none"> • Identify those environmental aspects that are necessary to monitor in order to verify legal compliance. • Establish procedures for how to monitor environmental aspects. • Establish procedures for reporting regulatory compliance.
<i>Nonconformance</i>	<ul style="list-style-type: none"> • Establish procedures for how to handle nonconformance. • Verify that the nonconformance procedure is working.

Issue	Activity/Responsibility
<i>Records</i>	<ul style="list-style-type: none">• Establish procedures for how and where to retain environmental records.
<i>Internal EMS audits</i>	<ul style="list-style-type: none">• Establish a plan for when, and by whom, the internal system audits shall be conducted.• Establish procedures for how to document EMS audits.• Document the EMS audit procedure.
<i>Management review</i>	<ul style="list-style-type: none">• Establish a list of issues to be addressed and documented at the management review meetings.• Establish a schedule for when the management review meetings are to be conducted.• Document the management review procedure.

SOP no.: EMS-4.4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.1 (1)

Structure and Responsibility

Copy to: Concerned Responsible

Elements	Prepared by (Concerned Managers)	Frequency of Review	Remarks
1. Organization chart personnel qualification	Departmental managers	Once/year	Satisfactory
2. Personnel qualifications	Human resource manager	Once/year	Satisfactory
3. Job description	Departmental managers	Once/year	Satisfactory
4. Training of staff to increase environmental awareness by <ul style="list-style-type: none"> • Internal means • External means 	Departmental managers	Once/year	Satisfactory
5. Motivation schemes <ul style="list-style-type: none"> • Financial • Nonfinancial 	Departmental managers	Once/year	Satisfactory
6. Communication to employees by <ul style="list-style-type: none"> • Slogans • Sign boards • Pictures • Memos 	Departmental managers	Once/year	Satisfactory
7. Staff goals and objectives based on EMS objectives and targets <ul style="list-style-type: none"> • Management review • New objectives and targets • Corrective actions follow-up • Audit findings follow-up 	Departmental managers	Once/year	Satisfactory
8. Interested parties <ul style="list-style-type: none"> • Supplier • Questionnaire 	Departmental managers	Once/year	Satisfactory

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.4.1

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.1 (2)

Supplier Questionnaire

- | | Yes | No |
|--|--------------------------|--------------------------|
| 1. Have you registered acc. to EMAS?
If yes, please send us your environmental report | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Are you certified to ISO 14001 of BS 7750? | <input type="checkbox"/> | <input type="checkbox"/> |

If either of the above questions have been answered with "yes," you do not have to reply to the following questions.

- | | | |
|--|--------------------------|--------------------------|
| 3. Are you planning to implement a certified environmental management system
If so, which and when? | <input type="checkbox"/> | <input type="checkbox"/> |
| Date: _____ | | |

- | | | |
|---|--------------------------|--------------------------|
| 4. Do you have an environmental policy?
If yes, please send us your policy. | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Have you undertaken an external or internal environmental audit?
If yes, please send us a summary of your program. | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Do you have an up-to-date environmental impact assessment?
If yes, please send us a summary of your program. | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Do you have an up-to-date environmental impact assessment?
If yes, please send us a copy.
If no, please describe briefly below what kind of environmental impacts your operations cause. | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Do you need consent, authorization environmental permit to operate? | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Have you an environmental contact person? | <input type="checkbox"/> | <input type="checkbox"/> |

Name, title

- | | | |
|--|--------------------------|--------------------------|
| 10. Do you educate your staff in environmental issues? | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Do you have any sites for surface treatment, metal plating, pickling, and so on? | <input type="checkbox"/> | <input type="checkbox"/> |

- | | Yes | No |
|--|--------------------------|--------------------------|
| 12. Do you have formal procedures for handling of hazardous waste from your sites? | <input type="checkbox"/> | <input type="checkbox"/> |
| 13. Did you receive instruction from our company to be in compliance with our EMS program during operations by your staff at our site. | <input type="checkbox"/> | <input type="checkbox"/> |
| 14. Other comments and responses to questions 12 and 13, if any | | |

Reviewed by: _____ **Signature** _____ **Date** _____
(EMS Coordinator)

SOP no.: EMS-4.4.2

Issue date: mm/dd/yyyy

Revision no.: New

*Attachment no. 4.4.2 (1)***Copy To: All Concerned**

Examples of the types of environmental training that can be provided by the organization are as follows:		
Type of Training	Audience	Purpose
Raising awareness of the strategic importance of environmental management	Senior management	To gain commitment and alignment to the organizations' environmental policy
Raising general environmental awareness	All employees	To gain commitment to the environmental policy, objectives and targets of the organization and instill a sense of individual responsibility
Enhancement of skills	Employees with environmental responsibilities	To improve performance in specific areas of the organization, e.g., operations, research, and development and engineering
Compliance	Employees whose actions can affect compliance	To ensure regulatory and internal requirements for training

Reviewed by:**(EMS Coordinator)**_____
Signature_____
Date

SOP no.: EMS-4.4.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.2 (2)

An Example List of Operations and Competence, and Requirements

Environmental Aspect	Activity	Min. Training Level
Emission of dust	Maintenance of bag-filters	Filter training course provided by the filter manufacturer
Noise from fan test	Measurement of noise level	Training on noise detector provided to new employee

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.4.2
Issue date: mm/dd/yyyy
Revision no.: New

Attachment no. 4.4.2 (3)

Copy To: All Concerned

Name: _____ Responsibility: Asst. EMS coordinator Job title: Senior manager
Qualification: Chemical engineer Location: Utilities Department: Engineering/Maintenance

Programs	Training Procedure	Training Tools	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Signature	Remarks
• Environmental awareness	001	Reading/Exam													XYZ	Satisfactory
• Aspects identification	002	Reading/Exam													XYZ	Satisfactory
• Impact analysis	003	Reading/Exam													XYZ	Satisfactory
• ISO 14001 standard	004	Reading/Exam													XYZ	Satisfactory
• Environmental regulatory requirements	005	Reading/Exam													XYZ	Satisfactory
• Specific skills and techniques	006	Reading/Exam													XYZ	Satisfactory
• Specific equipment operation	007	Reading/Exam													XYZ	Satisfactory
• Reorientation	008	Reading/Exam													XYZ	Satisfactory
• SOP reading	009	Reading/Exam													XYZ	Satisfactory
• Emergency handling	010	Reading/Exam													XYZ	Satisfactory
• Fire fighting	011	Reading/Exam													XYZ	Satisfactory
• First aid	012	Reading/Exam													XYZ	Satisfactory
• Evacuation drill	013	Reading/Exam													XYZ	Satisfactory
• Others	014	Reading/Exam													XYZ	Satisfactory

Trainer: _____
Signature

_____ Date

Training Reviewed by:
_____ (EMS Coordinator)

_____ Signature

_____ Date

SOP no.: EMS-4.4.3

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.3 (1)

Communication

Copy to: Concerned Responsible

Communication: Internal/External

Communication Source	Reference to	Reasons	Concerned Manager Remarks
<ul style="list-style-type: none"> • Customer • Media • Academic • Science • Government • Contractors and suppliers • Regulatory body • Insurance company • Banks • Industrial federation • Competitors • Employees • Shareholders 	<ul style="list-style-type: none"> • Policy✓ • New or altered system request • Significant aspect • Objectives and targets • Noncompliance report • Suggestion for improvement • Training request • Audits • Management reviews • Others 	Awareness	Departmental manager

Communication: YES NO

Policy amended: YES NO

Objectives amended: YES NO

Targets amended : YES NO

Program amended: YES NO

Implementation date: _____

Reviewed by: _____
(EMS Coordinator) Signature

_____ Date

SOP no.: EMS-4.4.4

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.4 (1)

Critical Documents Index

Key Procedures	Responsibility (Departmental Manager)
<ul style="list-style-type: none"> • Environmental policy • Identifying environmental aspects • Setting environmental objectives • Environmental programs • Retention of training records • Internal and external communication • Processing instructions • Emergency control • Regulatory compliance • Monitoring • Nonconform investigation • Change control • Corrective action and preventive measures • Calibration • Environmental monitoring records • Auditing • Management review • Complaints • Interested parties 	<p>Concerned manager</p>

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.4.5
 Issue date: mm/dd/yyyy
 Revision no.: New

Attachment no. 4.4.5 (1)

Example of EMS Documentation

Manual	Procedure	Instructions	Results Documents
<p>4.4.6 Operation control, e.g., waste handling</p> <p style="text-align: center;">➔</p> <p>The manual gives a short description of the principles for waste handling</p>	<p>Describes where and how waste is handled at the facility</p>	<ul style="list-style-type: none"> ➔ Handling of liquid waste at dept. X ➔ Handling of solid waste at dept. X ➔ Waste storage at dept. X ➔ Waste storage at dept. Y ➔ Waste treatment ➔ Waste transfer notes 	<p>Quantities type of waste</p>

<ul style="list-style-type: none"> * Objective * Responsibility * Authority 	<ul style="list-style-type: none"> * Sogmatire * Date 	<p style="text-align: center;">Procedure/Instructions</p> <p>Direction to the next level in the hierarchy</p>
--	---	--

SOP no.: EMS-4.4.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.4.5 (2)

Procedures Index

Subject	Procedure no.	Issue Date

SOP no.: EMS-4.4.6

Issue date: mm/dd/yyyy

Revision no.: New

Initials: _____

Attachment no. 4.4.6 (1)

Operational Controls

To: All Concerned

Environmental Aspects	Product Activity/ Service	Negative Impact Code No.	Significance Aspect Ranking	Objective and Target	Operational Control Procedures
A1 to Q1	Waste water treatment	N1-001	27	OT1A	EMS-001
				OT1B	EMS-002
				OT1C	EMS-003
				OT1D	EMS-004
				OT1E	EMS-005
				OT1F	EMS-006
					EMS-007
					EMS-008
					EMS-009
					EMS-010
					EMS-111
					EMS-112
A2 to Q2	Steam generation (boilers)	N1-002 N1-003 N1-004 N1-005	45	OT2A	EMS-111
				OT2B	EMS-112
				OT2C	EEP-086
					OCP-026
					OCP-020
	OCP-021				
	OCP-022				
	OCP-023				
A3 to Q3	Burning diesel electricity generation	N1-002 N1-004 N1-006	42		EMS-114
					EMS-115
					EMS-131
					EEP-090
	EEP-091				
A4 to Q4	HVAC system (CFCs ozone-depleting substances)	N1-006 N1-007 N1-008	42	OT4A	EMS-116
				OT4B	EMS-117
				OT4C	EMS-118
				OT4D	EEP-119
					EES-120
	EEP-121				

Environmental Aspects	Product Activity/ Service	Negative Impact Code No.	Significance Aspect Ranking	Objective and Target	Operational Control Procedures
A5 to Q5	Plastic plant	NI-009	28	OT5A OT5B OT5C	EMS-122 PPC-000 PPC-001 PPC-002 PPC-003 PPC-004 PPC-005 PPC-006 PPC-007 PPC-008 PPC-009 PPC-010 PPO-000 PPO-001 PPO-003 PPO-004 PPO-005 PPO-006 PPO-007
A6 to Q6	Aluminum plant	NI-006 NI-010	22	OT6A OT6B OT6C	EMS-123
A7 to Q7	Transportation	NI-002 NI-005 NI-006 NI-010 NI-112 NI-113	33	OT7A OT7B OT7C	EMS-124
A8 to Q8	Laundry operations	NI-007 NI-112	33	OT8A	EMS-125 EMS-126 EMS-030 EMS-034
A10 to Q10	Civil works	NI-006 NI-007 NI-114	25	OT10A OT10B	EMS-007
A11 to Q11	Tablet processing	NI-006 NI-010 NI-013 NI-014	33	OT11A	EMS-007
A12 to Q12	Capsule processing	NI-006 NI-114	36	OT11A	EMS-007
A13 to Q13	Powder processing	NI-006 NI-010 NI-114	36	OT11A	EMS-007

Environmental Aspects	Product Activity/ Service	Negative Impact Code No.	Significance Aspect Ranking	Objective and Target	Operational Control Procedures
A14 to Q14	Semisolid processing	NI-115 NI-110	30	OT11A	EMS-007
A15 to Q15	Liquid processing	NI-115	24	OT11A	EMS-007
A16 to Q16	Sterile processing		24	OT11A	EMS-007
A17 to A17	QC/PDL	NI-006	36	OT12A OT12B OT12C OT12D	Lab. safety manual EMS-130 EMS-138 EMS-139
A18 to Q18	Stores	NI-115	30	OT13A OT13B OT13C	WHS-001 WHS-027
A19 to Q19	Administration	NI-116	27	OT14A OT14B	EMS-007 EMS-132 EMS-133 EMS-134 EMS-135 EMS-136 EMS-137 Safety manual

Reviewed by:
(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.4.7

Issue date: mm/dd/yyyy

Revision no.: New

Initials: _____

Attachment no. 4.4.7 (1)

Emergency Preparedness and Resources

Department: Store Departmental Manager: _____

Task no.:	Date:	Prepared by: Concerned Manager
1. Historical review of incidents		Remarks
<ul style="list-style-type: none"> • Air pollution • Water pollution • Land pollution • Noise pollution • Nature of hazard • Pollution time • Transmissible • May occur in extreme condition • Lack of attention • May occur in normal condition • Nuisance potential <ul style="list-style-type: none"> - People - Business - Historical - Nature 		None None None None None None No In case of fire only Yes No Low High Low Low
2. Key personnel responsible: Store manager		
3. Emergency organization and responsibilities: Emergency-handling team		
4. Emergency-handling procedure: Available		
5. Material safety data sheet: Available		
6. Training material and program: Available		
7. Emergency drills (testing of effectiveness): Conduct twice/year		

Reviewed by: _____
 (EMS Coordinator) **Signature** **Date**

SOP no.: EMS-4.4.7

Issue date: mm/dd/yyyy

Revision no.: New

Initials: _____

Attachment no. 4.4.7 (2)

Emergency Plan

To: All Concerned Managers

Emergency Type	Location	Responsibility	Reference Procedure	External Help	Key Telephone Number
ACTIVITY 1)Boiler operation 2) 3) 4) 5) 6)	Utilities area	Utilities manager	001	No	xxxxx
PRODUCT 1) Tablet 2) 3) 4) 5) 6)	Production	Production manager	002	No	xxxxx
SERVICES 1) Shipping 2) 3) 4) 5) 6)	Loading bag	Shipping manager	003	No	xxxxx

Reviewed by:

(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5 (1)

Checking and Corrective Action

To: Concerned Manager

From: Responsible

1. Source	Details of Noncompliance
Activities Product Services Operational work Instructions Service report Customer complaint	<input type="checkbox"/> Major <input type="checkbox"/> Minor <input type="checkbox"/> Critical
2. In-process control	
3. Preventive measure	
4. Corrective action program	
5. Change control approval	
Concerned manager	EMS coordinator
6. Follow-up audit Planned on: Close out:	By: _____ <input type="checkbox"/> Yes <input type="checkbox"/> No
Remarks:	

Reviewed by:

(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5 (2)

Change Control

To: Concerned Manager

From:

Date:

Element	Aspect		Proposed		Remarks
	Current practice	Impact	Practice	Impact	
Activity					
Products					
Services					

Requires policy revision: _____

Requires objective revision: _____

Requires target revision: _____

Requires changes in program: _____

Reviewed by:

(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.5.1

Issue date: mm/dd/yyyy

Revision no.: New

Initials: _____

Attachment no. 4.5.1 (1)

Monitoring and Measurement

Activity/Products/ Services and Aspects	Types of Impacts	Monitoring	Procedure no.	Indicator	Limit
Attachment no. 4.3.1 (3) A to 4.3.1 (3) K	Waste 1. Cafeteria junk food 2. Broken bottles 3. Disposable shoe and head covers	Daily	EMS-000	Visual insp.	N/A
		Daily	EMS-000	Visual insp.	N/A
		Daily	EMS-000	Visual insp.	N/A
Attachment no. 4.3.2 (2) A to 4.3.1 (2) I.	4. Disposable kitchen items 5. Rejected raw materials 6. Rejected finished products 7. Damage PVC roll 8. Metallic dust 9. Gardening waste 10. Biological waste	Daily	EMS-000	Visual insp.	N/A
		Daily	QAS-183	Documentation	N/A
		Daily	QAS-183	Documentation	N/A
		Daily	EMS-000	Visual insp.	N/A
		Daily	EMS-000	Visual insp.	N/A
		Daily	EMS-000	Visual insp.	N/A
		Daily	QCS-014	Visual insp.	N/A
Attachment no. 4.3.1 (4) A to 4.3.1 (4) B	Energy Conservation 11. Electric 12. Water	Daily Daily/Shift	EMS-001 to EMS-006	Computer rec. Compliance rec.	Applicable Applicable

Activity/Products/ Services and Aspects	Types of Impacts	Monitoring	Procedure no.	Indicator	Limit
Attachment no. 4.3.1 (5) A to 4.3.1 (5) C	Other wastes				
	13. Kitchen oil (used)	Weekly	EMS-000	Visual insp.	N/A
	14. Transformer oil (used)	Yearly	EMS-000	Visual insp.	N/A
	15. Chemical dust	Daily	EMS-000	Visual insp.	N/A
	16. Ozone-depleting solvents	Weekly	EMS-000	Documentation	N/A
	17. Total liquid waste	Daily	EMS-000	Sewage treatment record	Applicable
	18. Batteries (used)	Yearly	EMS-000	Visual insp.	Applicable
	19. Smoke detector sensors (used)	Yearly	EMS-000	Visual insp.	N/A
	20. Sewage sludge	Monthly	EMS-000	Documentation	N/A
	21. Accidental fire	Ongoing	EMS-000	Documentation	N/R
22. Human health	Ongoing	EMS-000	Documentation	N/R	
Attachment no. 4.3.1 (3) A to 4.3.1 (3) K	Scrap not for sale				
	23. Plastic waste	Weekly	EMS-000	Visual insp.	N/A
	24. Cartons	Weekly	EMS-000	Visual insp.	N/A
Attachment no. 4.3.2 (2) A to 4.3.1 (2) I	25. Empty boxes	Weekly	EMS-000	Visual insp.	N/A
	Scrap for Sale				
	26. Empty plastic drums	Weekly	EMS-000	Documentation	N/A
	27. Empty steel drums	Weekly	EMS-000	Documentation	N/A
	28. Rejected wooden pallets	Weekly	EMS-000	Documentation	N/A
29. Aluminum scrap	Weekly	EMS-000	Documentation	N/A	

Attachment no. 4.3.1 (4) A to 4.3.1 (4) B	Scrap for Destruction				
	30. Broken blocks	Monthly	EMS-000	Visual insp.	N/A
	31. Damage concrete	Monthly	EMS-000	Visual insp.	N/A
Attachment no. 4.3.1 (5) A to 4.3.1 (5) C	32. Wooden scraps	Monthly	EMS-000	Visual insp.	N/A
	Reusable Scrap				
	33. Steel bars	Continuous basis	EMS-000	NR	N/A
	34. Steel plates	Continuous basis	EMS-000	NR	N/A
	35. Electrical cables	Continuous basis	EMS-000	NR	N/A
36. Ducting	Continuous basis	EMS-000	NR and	N/A	
37. Pipes	Continuous basis	EMS-000	EDS-018	N/A	

Note: N/A—Not applicable; NR—Not required.

EMS Coordinator: _____ **Date:** _____

SOP no.: EMS-4.5.2

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5.2 (1)

Evaluation of Compliance

To: _____

From: _____

Department: _____ Name: _____	
Audit checks:	
Policy: _____	Finding: _____
Objective: _____	Finding: _____
Target: _____	Finding: _____
Action Program: _____	Finding: _____
Indicator: _____	Finding: _____
Follow-up:	
Date: _____ Name: _____	

Note: Attach detailed audit report.

Reviewed by:

(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.5.4
 Issue date: mm/dd/yyyy
 Revision no.: New
 Initials: _____

Attachment no. 4.5.4 (1)

EMS Records

Prepared by: _____

To: Concerned Responsible

Source	Records	Shelf-Life	Responsibility	Location
Activity/Product and Activity	Regulatory	Replace when update received	EMS coordinator	EMS coordinator officer
	Legislation	Replace when update received	EMS coordinator	EMS coordinator officer
	Permits	3 years	Maint. director	EMS coordinator officer
	Training	3 years	Concerned managers	EMS coordinator officer
	Aspects/Impact	5 years	EMS coordinator	EMS coordinator officer
	Program	5 years	EMS coordinator	EMS coordinator officer
	Monitoring data	5 years	Concerned department managers and functional head responsible	EMS coordinator officer
	Nonconform	5 years		EMS coordinator officer
	Emergencies	5 years	Safety officer	EMS coordinator officer
	Customer feed back	5 years	EMS coordinator	EMS coordinator officer
	EMS audit	Permanent	EMS coordinator	EMS coordinator officer
	Calibration	3 years	Calib. officer	EMS coordinator officer
Maintenance	3 years	Maintenance director	EMS coordinator officer	

Reviewed by:

(EMS Coordinator)

Signature

Date

SOP no.: EMS-4.5.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5.5 (1)

Environmental Management System Audit Check List (General)

4.2 Policy	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Is there an environmental policy defining appropriateness; continual improvement, and public awareness on significant aspects affecting the environment?					
2. Is there a system for policy review based on <ul style="list-style-type: none"> • Documentation • Implementation • Maintenance, and • Communication 					
3. Is the policy statement signed off by the management responsible?					
4.3.1 Aspects/Impacts/Effects	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Environmental objectives are set on the basis of aspects/impacts/effects analysis?					
2. Is there a procedure describing aspects/impacts/effects analysis?					
3. The aspects/impacts/effects analysis carried out is documented.					
4. Procedures used to identify environmental aspects/impacts are maintained updated.					

4.3.2 Legal and Other Requirements	Reference SOPs	Reference Documents	Reference Records	Remarks/Observations	Completion Date
1. Is there a procedure describing access to the legal and other requirements applicable to the environmental aspects of the company's <ul style="list-style-type: none"> • Activities • Products • Services 					
4.3.3 Objectives and Targets	Reference SOPs	Reference Documents	Reference Records	Remarks/Observations	Completion Date
1. Are the objectives and targets consistent with environmental policy?					
2. Are the objectives and targets consistent with commitment to prevention of pollution?					
3. The communication (both internal and external) regarding environmental policy is <ul style="list-style-type: none"> • Maintained • Documented 					
4.3.4 Environmental Management Program	Reference SOPs	Reference Documents	Reference Records	Remarks/Observations	Completion Date
1. Is there an established documented environmental program?					
2. Is there a manual stating environmental policy, objectives, and targets?					
3. Is the control and distribution of the environmental management program satisfactory?					
4. Are resources, responsibilities and designations stated in the environmental management program?					
5. Is there a time frame described in the environmental management program to achieve objectives and targets?					

4.4.2 Training Awareness, Competency, and Communication	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Is there a procedure identifying training needs applicable to the functions of significant impacts within the company?					
2. Are personnel adequately trained for the functions that they perform?					
3. Is there an in-house training program?					
4. Is there an external course attendance program?					
5. Are training needs effectively identified?					
6. Are records of training maintained for each employee?					
7. Are required levels of qualifications and experience defined for environmental activities?					
8. Are the internal and external communications regarding environmental policy maintained and documented?					
4.4.6 Operational Control	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Is there a procedure to identify and document the operations and procedures related to suppliers and contractors as they impact environmental policy?					
2. Is there a procedure to ensure that the contractors are aware of company's EMS requirement?					
3. Is there an established documented purchasing system?					
4. Are these procedures ensuring that purchased product conforms to the specified environmental standard?					

5. Is there a system for evaluation of suppliers and subcontractors?					
6. Is there a documented procedure for the audit of suppliers and subcontractors?					
7. Is there an approved list of suppliers effecting the environmental policy?					
8. Are purchased materials listed by some class or grade?					
9. Is there a system to check purchased products against purchase order?					
10. Does order identify number and quality of material?					
11. Is there a procedure for verification of subcontractors products for environmental compliance?					
4.4.7 Emergency Preparedness and Response	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Do the work instructions/ procedure explain safety precautions during the specific activity?					
2. Are the employees trained to follow safety precautions at work?					
3. Are the emergency-handling procedures reviewed, revised, and updated?					
4. Are the emergency procedures tested (where practical) by simulation?					
5. Is there an emergency/ accident reporting system?					
6. Is there a procedure to identify aspects and impacts in case of emergency?					
7. Is the facility well equipped to manage crisis?					
8. Are the employees able to handle emergency situations?					

4.5.1 Monitoring and Measurement	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Are there the procedures to identify the key operations impacting environment?					
2. Are the evaluation procedures described to ensure compliance with legislation and regulations?					
3. Are the evaluation records maintained?					
4.5.2 Nonconformance, Corrective, and Preventive Actions	Reference SOPs	Reference Documents	Reference Records	Remarks/ Observations	Completion Date
1. Is there a procedure to define responsibility to handle nonconformance followed by corrective action and preventive measures?					
2. Does the system make provision for the identification and segregation of non conforming items pending disposition?					
3. Is there a procedure of raising non conformance reports and notifying relevant personnel customers in a timely manner?					
4. Is there a procedure for promptly implementing the agreed remedial action?					
5. Is a provision made for review and approval of documents applicable to rework on non conforming products?					
6. Does the system ensure retainment of records of corrective actions taken?					
7. Does the system allow notifications to legis lative authorities?					
8. Is there a procedure to describe corrective actions and preventive measures?					

4.5.2 Nonconformance, Corrective, and Preventive Actions	Reference SOPs	Reference Documents	Reference Records	Remarks/Observations	Completion Date
9. Does the system allow investigation and correction of noncompliance detected <ul style="list-style-type: none"> • Within the process • Product • Services • Within work operations/ Instructions • Customer complaints 					
10. Are CA causes and resolutions recorded?					
11. Are findings on nonconformance prescribed for management review?					
4.5.4 EMS Audit	Reference SOPs	Reference Documents	Reference Records	Remarks/Observations	Completion Date
1. Is there a procedure describing EMS audit <ul style="list-style-type: none"> • Frequency • Based on identified activities 					
2. Does the procedure ensure determining conformity, implementation, and maintenance of the EMS?					
3. Does the procedure indicate to inform the results to the management?					
4. Does the procedure describe the appropriate experience and qualification of the external auditors?					
4.6 Management Review	Reference SOPs	Reference Documents	Reference Records	Remarks/Observations	Completion Date
1. Does the procedure exist and describe periodical review of EMS?					
2. Does the procedure ensure to determine effectiveness and adequacy of the EMS?					
3. Does the procedure ensure changes in the existing EMS based on the changes?					

SOP no.: EMS-4.5.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5.5 (2)

Revision Form

DEPARTMENT:			PROCEDURE NO.:
FROM:		TO:	
TITLE:		CC:	
DATE:			
Internal	External Audit	Customer complaint	Supplier
<i>(1) Statement of the problem:</i>			
<i>(2) Root cause of the problem:</i>			
<i>(3) Solution:</i>			
<i>(4) Solution implementation of the action plan:</i>			
<i>(5) Monitor dates/actions required by others:</i>			
Date:		Signature:	

Please attach additional pages if necessary

SOP no.: EMS-4.5.5

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.5.5 (3)

EMS System Audit Programme

Copy to: Concerned Manager

Scope	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Departments	Auditor
General and policy	X													
Aspects, legal, program		X												
Structure, responsibility			X											
Communication				X										
Documentation, document control					X									
Operational control, emergencies						X								
Monitoring							X							
Corrective actions, records								X						
Audit, review									X					

Prepared by: _____

Signature **Date**

Reviewed by: _____

(EMS Coordinator) **Signature** **Date**

SOP no.: EMS-4.6

Issue date: mm/dd/yyyy

Revision no.: New

Attachment no. 4.6 (1)

Management Review Form

PARTICIPANTS: All concerned managers **DATE:** mm/dd/yyyy

A. Inputs to the review could include the following:

- Audit summaries
- Changes in viewpoints and opinions of interested parties
- Results of any performance improvement projects
- Monitoring summaries showing compliance results
- Summary of communications regarding performance
- Summary of reports to regulators
- Proposals for new or changed objectives

B. The review should aim to answer these questions

- Is the EMS satisfactory? If not, what needs to be done?
- Is it meeting company needs
- Did we meet our objectives? If not, why not?
- Did we achieve regulatory compliance? If not, why not?
- What changes do we need to make?
- Do our objectives need to be broader? Narrower? More ambitious? Less ambitious?
- What should our objectives be for the coming period?
- Have there been any regulatory or other changes which need to be considered?
- Is our policy still appropriate?
- Others

Remarks by: Participants

Reviewed by: _____
 (EMS Coordinator) **Signature** **Date**

Recommended Reading

1. ISO 9004, Managing for the sustained success of an organization—A quality management approach.
2. ISO 10001:2007, Quality management—customer satisfaction—Guidelines for codes of conduct for organizations.
3. ISO 10002:2004, Quality management—customer satisfaction—Guidelines for complaints handling in organizations.
4. ISO 10003:2007, Quality management—customer satisfaction—Guidelines for dispute resolution external to organizations.
5. ISO 10005:2005, Quality management systems—Guidelines for quality plans.
6. ISO 10006:2003, Quality management systems—Guidelines for quality management in projects.
7. ISO 10007:2003, Quality management systems—Guidelines for configuration management.
8. ISO 10012:2003, Measurement management systems—Requirements for measurement processes and measuring equipment.
9. ISO/TR 10013:2001, Guidelines for quality management system documentation.
10. ISO 10014:2006, Quality management—Guidelines for realizing financial and economic benefits.
11. ISO 10015:1999, Quality management—Guidelines for training.
12. ISO/TR 10017:2003, Guidelines for statistical techniques for ISO 9001:2000.
13. ISO 10019:2005, Guidelines for the selection of quality management system consultants and use of their services.
14. ISO 14001:2004, Environmental management systems—Requirements with guidance for use.
15. ISO 19011:2002, Guidelines for quality and/or environmental management systems auditing.
16. IEC 60300-1:2003, Dependability management—Part 1: Dependability management systems.
17. IEC 61160:2006, Design review.
18. ISO/IEC 90003:2004, Software engineering—Guidelines for the application of ISO 9001:2000 to computer software.

19. Quality management principles, ISO, 2001.
20. ISO 9000—Selection and use, ISO, 2008.
21. ISO 9001 for Small Business—What to do; Advice from ISO/TC 176, ISO, 2002.
22. ISO Management Systems
23. Reference websites:
 - <http://www.iso.org>
 - <http://www.tc176.org>
 - <http://www.iso.org>
 - <http://www.iso.org/tc176/sc2>
 - <http://www.iso.org/tc176/ISO9001AuditingPracticesGroup>