

INTEGRATED
ENVIRONMENTAL
MANAGEMENT
SERIES

**ENVIRONMENTAL SITE
MANAGEMENT &
REHABILITATION AWARENESS
COURSE MEMORANDUM**

Management Level

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Tel: (012) 336 7500/ +27 12 336 7500
Fax: (012) 323 0321/ +27 323 0321

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Co-ordinated by:

Sub-Directorate: Environment and recreation
Private Bag X313
PRETORIA
0001

In Collaboration with:

Van Riet and Louw Landscape Architects
PO Box 36723
Menlo Park
Pretoria
0102

DOCUMENT INDEX

Reports as part of the IEM Series

Report number	Report title
IEMS 1.1	Administration and User Manual of the IEMS
IEMS 1.2	Environmental Policy and Strategy
IEMS 1.3	Consolidated Environmental Implementation and Management Plan
IEMS 1.4	Integrated Environmental management Framework
IEMS 1.5	Environmental decision Support System
IEMS 1.6	Environmental Best Practice Guidelines and Specifications
IEMS 1.7	Environmental Monitoring and Auditing Guidelines
IEMS 1.8	Environmental Reporting
IEMS 1.9	Sustainable Development Management System
IEMS 1.10	Environmental legal Guide Booklet

APPROVAL

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Approved for the Department of Water Affairs and Forestry by:

Ms Valerie du Plessis
Deputy Director: Environment and Recreation

Mr Piet Pretorius
Director: Water Abstraction and Instream Use

Approved for Van Riet and Louw Landscape Architects by:

Ms Mandy van der Westhuizen
Van Riet and Louw Landscape Architects Project Manager

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The following individuals are thanked for their contributions to the document:

Project Management Committee

Pieter Ackerman	Department of Water Affairs & Forestry
Valerie du Plessis	Department of Water Affairs & Forestry
Anet Muir	Department of Water Affairs & Forestry
Geraldine Munroe	Department of Water Affairs & Forestry
Mandy van der Westhuizen	Van Riet and Louw Landscape Architects
Peter Velcich	Van Riet and Louw Landscape Architects

FOREWORD

1. This memorandum is designed to accompany the Environmental Site Management and Rehabilitation Awareness Course presentation (Management Level), which is available in MSPowerpoint format.
2. The Environmental Site Management and Rehabilitation Awareness Course is a means to implement the Environmental Site Management & Rehabilitation Specification protocol, of which the latter is a supporting management tool under the umbrella of an Integrated Environmental Management Framework (IEMF) for water sector support.
3. This course is intended for managers, foremen, and employees displaying an interest and aptitude for Environmental Management on the construction site (identified during the presentation of the General Level course).
4. The host of the course should use this memorandum prior to giving the MSPowerpoint presentation to familiarise him or herself with the course content.
5. The content of each page of the presentation is included under a separate heading in the memorandum and each item to be discussed has been separated into a paragraph.
6. The course host should navigate through the presentation by means of a single mouse click for each new paragraph as well as for each new page.
7. It is recommended that a printout of the MSPowerpoint presentation be circulated to each of the course participants, which they should be allowed to take with them.
8. A certificate of completion is available in MSPowerpoint format, which should be printed, signed and circulated to each of the course participants following the completion of the presentation.

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PAGE 1: WELCOME

Welcome to this presentation of a course aimed at Environmental Site Management and Rehabilitation Awareness.

The course is part of an initiative driven by the Department of Water Affairs and Forestry: Directorate Water Abstraction and Instream Use; Sub-Directorate: Environment and Recreation to set a standard for Environmental management in DWAF.

PAGE 2: THE NEED FOR THE ESM&RAC

The need for the ESM&RAC

Construction activities on construction sites need to be strictly regulated to ensure that all projects are developed and implemented according to sound environmental standards and norms.

In pursuit of this, a need was identified by the Department of Environmental Affairs and Tourism (DEAT) and the Department of water Affairs and Forestry (DWAF) to develop and implement an Environmental Management Plan (EMP) and Environmental Site Management and Rehabilitation Specification (ESM&RS) tools and subsequently an Environmental Site Management and Rehabilitation Awareness Course so as to inform and educate all levels of construction site personnel as to why the desired environmental standards are necessary as well as to explain how such is achieved on the construction site.

It is believed that with a background of basic environmental awareness and an understanding of basic environmental issues and sensitivities, construction personnel may be motivated and empowered to do their share in helping to maintain the integrity of the environment on the construction site through environmental impact management.

The goal of this course is therefore to enable a shared understanding and common vision of the environment, the impact of a construction project on the environment (and why this is important) and the role of construction personnel in terms of environmental management and compliance.

The **first step** will include background discussion of the environment concept: of what it comprises and how we interact with it.

The **second step** will be a description of the components and phases of a construction project within any project's business life cycle processes.

The **third step** will be a general account of how a construction project and its associated activities usually affects the environment, giving rise to what we call Environmental Impacts.

The **fourth** and most important step will be a discussion of what construction staff can do in order to help prevent the negative environmental impacts from degrading our environment. This is known as Environmental Impact Management.

In recognition of this need to protect our environment, the South African Government has passed a number of laws which require that certain procedures be followed and that certain actions be taken before construction begins as well as during and after the construction project has been completed. The Environmental Management which we will discuss here today is therefore not only our moral obligation, but is in fact informed by legislation and enforced by law.

PAGE 3: THE ENVIRONMENT

The environment

The world that we live in consists essentially of three different environments, namely the living natural environment, the non-living natural environment and the man-made environment.

The living environment consists of our plant and animal resources.

The non-living environment includes the soil, water and geological resources.

And the man made environment comprises our infrastructure, social, cultural and archaeological resources.

These environments depend on one another, and man depends on them all for his survival. Damage to one will be felt by others, so we must try to protect the components, as well as their interactions with one another as they occur in nature.

When we undertake a development, we must keep this concept in mind, and plan and implement all development in such a way that we benefit today without compromising the ability of future generations to benefit as well.

This is known as sustainability.

PAGE 4: PHASES OF A CONSTRUCTION PROJECT

Phases of a construction project

A construction project ordinarily consists of four phases:

Project planning is the phase during which possible alternatives for developments are identified, in order to determine the most feasible option. This could involve environmental studies (such as Environmental Impact Assessment (EIA) reports). Alternatively, where certain activities are not legislated to submit an EIA report, an Impact and Aspect Register (as part of the IEMF) is completed in to identify any possible significant impacts on the environment. During this phase, the decision is taken whether a particular project will proceed or not.

Pre-construction is the phase during which all necessary preparations are carried out before the construction personnel are moved onto site to begin work. This includes the development of an Environmental Management Plan (EMP) and various construction layout plans, including Zoning and Master Plans. In addition, Environmental Site Management and Rehabilitation Specifications (ESM&RS) and Codes of Conduct that will be relevant for the particular project are developed.

The construction phase entails the physical construction works according to a construction programme. During this phase, the Environmental Management Plan will be in place, and the construction works will be monitored and audited according to its specifications. Corrective action will be undertaken where necessary.

The **Post construction / rehabilitation phase** includes the cleanup of the construction site and the reinstatement of the environment in all disturbed areas. During this phase, the contractor's compliance to the environmental specifications and legislation will be inspected and audited

through a monitoring programme in order to ensure that the site is left in a sustainable condition when the contractor moves off site.

PAGE 5: COMPONENTS OF A CONSTRUCTION PROJECT

Components of a construction project

A typical construction project consists of a number of different components, including the following:

- Contractors' yards;
- Access roads;
- Spoil areas and stockpiles;
- Cut and fill areas;
- Quarries and borrow areas;
- Batching plants;
- Crusher plants and sand washing plants;
- Housing and recreation areas;
- Pipelines;
- Tunnels;
- Canals;
- River diversions;
- Weirs, and
- Dam walls and impoundments.

PAGE 6: WHAT IS AN ENVIRONMENTAL IMPACT

What is an Environmental Impact?

An environmental impact is the result, either good or bad, of man's actions (such as the various components of construction) on the natural environment's resources, be they living, non- living or man-made.

Impacts can occur either as a result of:

- The use of a resource;
- Or the pollution of a resource.

In addition, impacts can be categorised as the following:

- Foreseen, such as the necessary clearing of the construction site before construction begins, or Unforeseen, such as the flooding of an area following heavy rains;
- Avoidable, such as the unnecessary spillage of diesel during refuelling, or Unavoidable, such as the disturbance created during trenching;
- Simple, such as litter untidying the construction site, or Cumulative, such as the pollution of water upstream, which then makes downstream users sick.

PAGE 7: TYPES OF ENVIRONMENTAL IMPACTS

Types of Environmental Impacts

Typical environmental impacts anticipated on a construction site include the following:

- The loss of plants;
- The loss of animals;
- Soil pollution;
- Lowering of aesthetics;
- Dust liberation;
- Soil compaction and erosion;
- Water pollution;
- Loss of health and personal injury;
- Loss / creation of livelihood;
- Loss / creation of access;
- And loss of heritage and culture.

PAGE 8: CAUSES OF ENVIRONMENTAL IMPACTS

Causes of environmental impacts

These environmental impacts are caused primarily by inadequate planning & not adhering to the Environmental Management Specifications:

- The inadequate planning & preparation of the construction site;
- The uncontrolled expansion of the construction site footprint;
- The uncontrolled activity of construction staff;

- The injudicious removal / disturbance of vegetation and habitat;
- The unnecessary loss of soil;
- Uncontrolled vehicular movement & circulation;
- The haphazard storage of vehicles, equipment and material;
- The uncontrolled servicing, repair and refuelling of vehicles;
- Unclear policy on solid waste management;
- Unclear policy on waste water;
- The uninformed use, storage and disposal of hazardous material;
- The erosive power of storm water and runoff;
- Unintentional fires;
- And the lack of follow up action after the completion of construction works.

PAGE 9: IMPACT MITIGATION

Impact mitigation

These environmental impacts may, however be mitigated through proper and appropriate impact management. The Environmental Management Plan is a Specification containing all the necessary Environmental Management actions necessary on site

- On a general staff level;
- And on a management staff level.

PAGE 10: IMPACT MANAGEMENT: PRE-CONSTRUCTION PREPARATION (MANAGEMENT LEVEL)

Impact management: Pre-construction preparation (management level):

- Compile an Environmental Site Management and Rehabilitation (ESM&R) Plan in conjunction with the Environmental Planner;
- Develop a construction programme & inform Interested and Affected Parties;
- Set up a monitoring and auditing protocol;
- Set out the construction camps and areas;
- Identify all significant features;
- Fence in significant features;

- Plan roads around significant features;
- Draw up a surface water management plan;
- Identify slopes that need protection and protect these.

PAGE 11: IMPACT MANAGEMENT: SITE ESTABLISHMENT (GENERAL LEVEL)

Impact management: Site establishment (general level):

- Do not cross any site fences or cordoned off areas;
- Do not walk, drive or store material in rehabilitating areas;
- Report any access into fenced off areas to the foreman / engineer / environmental manager;
- Use only areas designated for certain construction activities;
- Do not access any stream or water body without permission;
- Report any headstones, graves or human remains you may find to the foreman / engineer / environmental manager.

PAGE 12: IMPACT MANAGEMENT: SITE ESTABLISHMENT (MANAGEMENT LEVEL)

Impact management: Site establishment (management level):

- Cordon off all construction areas according to the ESM&R Plan;
- Declare rehabilitating areas out of bounds to all staff;
- Declare all streams and water bodies out of bounds to all staff;
- Define construction activity areas (e.g. for mixing concrete);
- Cordon off any area in which headstones, graves or human remains have been discovered;
- Install and / repair fences demarcating out of bounds areas as this is required.

PAGE 13: IMPACT MANAGEMENT: CONSTRUCTION STAFF MANAGEMENT (GENERAL)

Impact management: Construction staff management (general):

- Only eat, cook, sleep and recreate in the areas designated on site;
- Do not bathe anywhere except in the designated areas on site;
- Always use the toilet facilities provided;

- Only use the water provided on site. Do not collect water from or dispose water into a natural water course;
- Always make use of the specified construction site safety measures;
- Do not hunt, kill or injure any animals anywhere on site;
- Inform the foreman / engineer / environmental manager of any dangerous or problem animals;
- Do not leave any food or rubbish where scavengers can get at it.

PAGE 14: IMPACT MANAGEMENT: CONSTRUCTION STAFF MANAGEMENT (MANAGEMENT LEVEL)

Impact management: Construction staff management (management level):

- Cordon off all staff housing and recreation areas according to the ESM&R Plan;
- Define staff cooking and eating areas;
- Provide adequate ablution and washing facilities for staff and maintain these in a suitably hygienic state;
- Ensure that staff make use of specified site safety measures;
- Provide a suitable and adequate source of potable water and monitor consumption and safety for use;
- Arrange to have any problem animals removed in the proper manner.

PAGE 15: IMPACT MANAGEMENT: HEALTH AND SAFETY (GENERAL)

Impact management: Health and safety (general):

- Always use the toilet & hand washing facilities provided.
- Only use the water provided on site – do not collect water from or dispose water into a natural water course.
- Make use of the specified protective gear for noisy and dusty conditions.
- Always wear proper protective head and foot gear while on site.
- Know where to find a list of emergency numbers in the event of one.
- Report accidents, injuries and unsafe site conditions to the Safety Officer.

PAGE 16: IMPACT MANAGEMENT: HEALTH AND SAFETY (MANAGEMENT)

Impact management: Health and safety (management):

- Provide adequate ablution & washing facilities for staff & maintain these in a suitably hygienic state.
- Provide a suitable and adequate source of potable water & monitor use and safety.
- Ensure safe working conditions and that staff make use of specified site safety measures.
- Ensure that staff wear proper protective head and foot gear while on site.
- Keep a first aid kit and a list of emergency numbers in an accessible place on site.
- Appoint a Safety officer and monitor site safety.

PAGE 17: IMPACT MANAGEMENT: VEGETATION CLEARING (GENERAL)

Impact management: Vegetation clearing (general):

- Do not damage, destroy or remove any significant tree that has been marked;
- No firewood may be harvested without permission;
- Newly planted trees may not be disturbed in any way;
- Do not excavate beneath the crown of any tree that has been marked;
- No conserved tree may be used to support or hang anything in;
- Report to the foreman / engineer / environmental manager any damage to any significant tree that has been marked.

PAGE 18: IMPACT MANAGEMENT: VEGETATION CLEARING (MANAGEMENT LEVEL)

Impact management: Vegetation clearing (management level):

- Locate all marked trees and clumps (ESM&R Plan) and fence these as out of bounds areas;
- Do not damage, destroy or remove vegetation wherever possible;
Only clear areas of vegetation before construction work begins there - not before;
- Remove all invasive / exotic vegetation as this emerges;
- Ensure that newly planted trees are not disturbed – declare these areas out of bounds.

PAGE 19: IMPACT MANAGEMENT: SOIL REMOVAL AND STORAGE (GENERAL)

Impact management: Soil removal and storage (general):

- Only excavate soil, gravel, rock etc. from designated areas;
- Stockpile soil only as instructed and at the time it is instructed;

- Do not make new stockpiles without permission;
- Do not use soil or remove soil from any stockpile without permission;
- Do not walk, drive or store any equipment, machinery or material on any stockpile.

PAGE 20: IMPACT MANAGEMENT: SOIL REMOVAL AND STORAGE (MANAGEMENT LEVEL)

Impact management: Soil removal and storage (management level):

- Strip topsoil from work areas only as necessary (ESM&R Plan) – not before;
- Stockpile topsoil only in designated areas (ESM&R Plan);
- Stockpile excess soil from excavations – no haphazard dumping is allowed;
- Only import backfill from approved stockpiles and borrow pits;
- Only use topsoil imported from approved stockpiles;
- Ensure that no stockpiles exceed specified heights and slopes;
- Ensure that stockpiles are protected from wind, rain and traffic.

PAGE 21: IMPACT MANAGEMENT: ACCESS AND TRANSPORT (GENERAL)

Impact management: Access and transport (general):

- Only drive on designated roads and tracks;
- Move obstacles out of the way rather than drive around them;
- Only cross drainage lines at designated points;
- Always stay within the specified speed limit.

PAGE 22: IMPACT MANAGEMENT: ACCESS AND TRANSPORT (MANAGEMENT LEVEL)

Impact management: Access and transport (management level):

- Construction roads may only be built in approved locations according to the ESM&R Plan;
- Construction roads must comply with drainage and surfacing specifications;
- Construction roads must be wet regularly;
- Construction roads must be monitored for potholes and rutting and maintained accordingly;
- Illegal routes and shortcuts must be closed off immediately.

PAGE 23: IMPACT MANAGEMENT: STORAGE OF VEHICLES, EQUIPMENT AND MATERIALS (GENERAL)

Impact management: Storage of vehicles, equipment and materials (general):

- Store machinery, vehicles and materials only in demarcated areas;
- Do not leave machinery and equipment standing around if not in use;
- Only park vehicles in designated areas;
- Do not park heavy vehicles or store equipment under or near trees;
- Do not store machinery, vehicles or materials in undisturbed or rehabilitating areas.

PAGE 24: IMPACT MANAGEMENT: STORAGE OF VEHICLES, EQUIPMENT AND MATERIALS (MANAGEMENT LEVEL)

Impact management: Storage of vehicles, equipment and materials (management level):

- Demarcate sites for the storage of machinery, vehicles and materials as per the ESM&R Plan;
- Ensure that all deliveries are taken directly to the designated storage areas;
- Provide enough shaded temporary parking on the construction site.

PAGE 25: IMPACT MANAGEMENT: SERVICING, REPAIR AND REFUELLING OF VEHICLES (GENERAL)

Impact management: Servicing, repair and refuelling of vehicles (general):

- Only service machinery and vehicles in designated areas;
- Regularly check your vehicle for fuel and oil leaks;
- Inform the foreman / engineer / environmental manager of leaking vehicles and machinery so that he can schedule repairs;
- Only refuel by means of a pump and on the bund created for that purpose;
- Immediately clean any accidental fuel and oil spills – do not hose spills into the natural environment;
- Dispose of contaminated soil as hazardous waste in the correct location on site.

PAGE 26: IMPACT MANAGEMENT: SERVICING, REPAIR AND REFUELLING OF VEHICLES (MANAGEMENT LEVEL)

Impact management: Servicing, repair and refuelling of vehicles (management level):

- Designate vehicle servicing areas on the construction site as per the ESM&R Plan;
- Ensure that all vehicles and machinery are maintained in good working order;
- Immediately schedule repair work for any leaking vehicles and machinery;

- Ensure that all refuelling areas are equipped with a pump and a bund;
- Ensure that all service areas for machinery and vehicles are equipped with the specified pollution control mechanisms.

PAGE 27: IMPACT MANAGEMENT: SOLID WASTE MANAGEMENT (GENERAL)

Impact management: Solid waste management (general):

- Do not litter – make use of refuse bins provided;
- Concrete may only be mixed in designated areas and not directly on the ground;
- Do not hose spills into the natural environment – inform the foreman / engineer / environmental manager of spills you are unable to clean yourself;
- Dispose of construction rubble only in specified storage areas – if in doubt, ask;
- Do not bury, hide or burn any waste of any nature;
- Inform the foreman / engineer / environmental manager of any illegal litter or dumping site that you encounter.

PAGE 28: IMPACT MANAGEMENT: SOLID WASTE MANAGEMENT (MANAGEMENT LEVEL)

Impact management: Solid waste management (management level):

- Provide adequate numbers of specified refuse bins – empty these regularly;
- Designate areas for the storage of various wastes – ensure this is adequate;
- Regularly remove various wastes to licensed off-site landfill sites;
- Immediately remove any illegal litter or dumping site that is reported;
- Reported spillages of construction waste are to be cleaned immediately.

PAGE 29: IMPACT MANAGEMENT: WASTE WATER MANAGEMENT (GENERAL)

Impact management: Waste water management (general):

- Do not use any natural water course to wash machinery, vehicles or equipment;
- Only wash machinery, vehicles or equipment in designated areas;
- Conserve water and report any leaks and overflow to the foreman / engineer / environmental manager. This is especially relevant for sludge dams, evaporation dams, batching areas, quarries and vehicle service and wash areas.

PAGE 30: IMPACT MANAGEMENT: WASTE WATER MANAGEMENT (MANAGEMENT LEVEL)

Impact management: Waste water management (management level):

- Ensure that all designated wash areas for machinery, vehicles and equipment are equipped with specified pollution control mechanisms;
Empty sumps regularly and immediately fix any reported leaks;
- Maintain all waste and grey water disposal facilities in an acceptable and operational state.

PAGE 31: IMPACT MANAGEMENT: MANAGEMENT OF HAZARDOUS MATERIAL (GENERAL)

Impact management: Management of hazardous material (general):

- Make sure that you know how to handle all hazardous substances;
- Do not access stores for hazardous substances without permission;
- Immediately clean any minor accidental spills and leaks;
- Do not hose any leaks or spills into the natural environment;
- Dispose of all hazardous waste in specified storage areas – if in doubt, ask;
- Immediately report any major leaks and spills to the foreman / engineer / environmental manager.

PAGE 32: IMPACT MANAGEMENT: MANAGEMENT OF HAZARDOUS MATERIAL (MANAGEMENT LEVEL)

Impact management: Management of hazardous material (management level):

- Ensure that staff know how to handle all hazardous substances;
- Ensure that hazardous substance stores are secure and equipped with specified pollution control measures;
- Immediately clean any reported spills and leaks;
- Ensure that hazardous waste disposal areas are equipped with specified pollution containment measures;
- Regularly remove hazardous wastes to a licensed off-site hazardous waste disposal site.

PAGE 33: IMPACT MANAGEMENT: EROSION PROTECTION (MANAGEMENT LEVEL)

Impact management: Erosion protection (management level):

- Ensure that all required storm water drainage measures (ESM&R Plan) are installed and maintained;
- Ensure that all required energy dissipation mechanisms are installed and maintained;
- Ensure that all cut and fill slopes are safe and in line with slope specifications (1:3 gradient unless otherwise specified);
- Correct any causes of erosion as soon as erosion becomes evident;
- Keep the drainage ways of access routes open and functional;
- Initiate rehabilitation measures as soon as or before erosion begins.

PAGE 34: IMPACT MANAGEMENT: FIRE MANAGEMENT (GENERAL)

Impact management: Fire management (general):

- Do not make open fires except in permitted areas and at permitted times;
- Do not leave any fires unattended. Extinguish these before you leave the area;
- All cooking is to be done on gas / electric stoves and only in the areas provided;
- Ensure that you know where fire fighting equipment is located.

PAGE 35: IMPACT MANAGEMENT: FIRE MANAGEMENT (MANAGEMENT LEVEL)

Impact management: Fire management (management level):

- Maintain a firebreak around the perimeter of the construction site (ESM&R Plan);
- Adequate fire fighting equipment must be in place at all fuel stores (ESM&R Plan);
- Take out fire insurance in high risk areas.
- Immediately extinguish any fires that break out.

PAGE 36: IMPACT MANAGEMENT: AESTHETICS (MANAGEMENT LEVEL)

Impact management: Aesthetics (management level):

- Ensure that all plans (including plant plans and rehabilitation plans) are implemented properly;

- Ensure that suitable equipment and manpower is available to carry out all specified construction, maintenance and rehabilitation tasks;
- Implement all design and rehabilitation specifications so that the development blends in with the natural surrounding landscape.

PAGE 37: IMPACT MANAGEMENT: SOCIAL ISSUES (MANAGEMENT LEVEL)

Impact management: Social issues (management level):

- Ensure that social representation, upliftment, empowerment and needs training commitments are met. Use existing social structures and communication channels;
- Ensure that an incidents register is kept up to date and that it is made available;
- Ensure that a complaints register is kept up to date;
- Ensure that pest control is carried out as specified;
- Ensure that dust is controlled on site.

PAGE 38: IMPACT MANAGEMENT: POST CONSTRUCTION REHABILITATION (MANAGEMENT LEVEL)

Impact management: Post construction rehabilitation (management level):

- Remove all construction infrastructure completely from the site;
- Rework all stockpiled soil back into the landscape as per specification;
- Shape, rip and scarify compacted areas as per specification;
- Reintroduce indigenous vegetation and control alien plants as per specification;
- Maintain firebreaks for a year;
- Monitor the rehabilitation site for at least a year in terms of compliance to the EMP and implement corrective work where required.

PAGE 39: LEGISLATION

Legislation

Environmental legislation is in place to protect the environment and the people that use it from harm as a result of damaging activities caused through both ignorance and indifference.

The principles of Integrated Environmental Management (IEM) is a code of practice for ensuring that environmental considerations are adequately and effectively incorporated into all the stages of the planning, feasibility decision making and implementation phases of a project in order to achieve a desirable balance between resource protection and development, and further to this to enable informed, accountable decision-making and setting of environmental quality goals.

In addition, Environmental framework legislation is in place to give legal structure to assessing development proposals and issuing authorisations for these developments based on sound environmental principles. These include:

- The National Environmental Management Act (NEMA), Act 107 of 1998, which legislates the National Environmental Management principles and focuses specifically on co-operative governance, sustainable development and public participation;
- The Environment Conservation Act (ECA), Act 73 of 1989, which identifies and regulates activities which may have a detrimental impact on the environment;
- The National Water Act (NWA), Act 36 of 1998, which aims, through management, to achieve sustainable and equitable use and supply of water for the benefit of all users and
- The National Heritage Resources Act (NHRA), Act 25 of 1999, which informs / restricts development on or near heritage resources.
- The Minerals and Petroleum Resources and Development Act, Act 28 of 2002.
- The Occupational Health and Safety Act (OHSA), Act 85 of 1993.

In order to achieve sound environmental management practices, a number of environmental assessment and management tools are aligned with Integrated Environmental Management (IEM) principles and water sector business processes as supporting tools of DWAF's Integrated Environmental Management Framework (IEMF). These are available to give practical guidance during the planning decision making and implementation phases of a project and include:

- Strategic Environmental Assessments, which identify regional characteristics of environmental importance, on which large scale planning should be based.
- Environmental Impact Assessments, which address specific development proposals and explore their suitability in terms of the environment in which they are located.
- Sustainable Utilisation Plans, which address the long term management and utilisation of resources such as dams.
- Environmental Management Plans, which prescribe specific actions that should be undertaken during planning, construction and operation of an approved development;
- Environmental Best Practice Guidelines and Specifications (for Planning, Construction, Operations and Decommissioning) which inform environmental planners, managers, contractors and operators of environmental procedures and actions to be taken during the various phases of a project lifecycle.

Environmental Monitoring and Auditing Protocols which are control mechanisms to ensure that the planning, construction and operation of a development complies to legislation so that corrective actions may be undertaken.

PAGE 40: ENVIRONMENTAL APPROVAL

Environmental Approval

Every facility, service and road which has ever been developed has had and continues to have an effect on the surrounding environment, both during construction and operation.

As a result of this, a number of specific activities have been listed in the Environment Conservation Act, which are likely to result in significant environmental impacts, and will require Environmental Authorization. Such activities that may be encountered on a Construction site include the following:

- Change of land use;
- Roads, railways and airfields;
- Cableways;

- Canals and channels;
- Dams, levees and weirs;
- Reservoirs and pipelines for public water supply;
- Public and private resorts;
- Sewage treatment plants;
- Tunnels;
- The reclamation of land below the high water mark.

Only once the governing authority has decided that the environmental impacts anticipated are of an acceptable nature and level or may be mitigated to acceptable levels, may construction begin.

PAGE 41: VISION AND MISSION

Vision and Mission

Ultimately the purpose of Environmental Awareness is to support and the Vision and Mission of the Department of Water Affairs and Forestry.

The Vision of DWAF, in brief is:

- A democratic, people-centred nation working towards human rights, social justice, equity and prosperity for all.
- A society in which all our people enjoy the benefits of clean water and hygienic sanitation services.
- Water used carefully and productively for economic activities, which promote the growth, development and prosperity of the nation.
- A land in which our natural forests and plantations are managed in the best interests of all.
- A people who understand and protect our natural resources so as to make them ecologically stable and safeguard them for current and future generations.
- A Department that serves the public loyally, meets its responsibilities with energy and compassion and acts as a link in the chain of integrated and environmentally sustainable development.
- Development and co-operation throughout our region of playing our part in the African Renaissance.

The Mission of DWAF, in brief is:

- Conserving, managing and developing our water resources and forests in a scientific and environmentally sustainable manner in order to meet the social and economic needs of South Africa, both now and in the future.
- Ensuring that water services are provided to all South Africans in an efficient cost-effective and sustainable way.
- Managing and sustaining our forests, using the best scientific practice in a participatory and sustainable manner.

- Educating the people of South Africa on ways to manage, conserve and sustain our water and forest resources.
- Co-operating with all spheres of Government in order to achieve the best and most integrated development in our country and region.
- Creating the best possible opportunities for employment, the eradication of poverty and the promotion of equity, social development and democratic governance.

PAGE 42: CONCLUSION

Conclusion

With this background of environmental awareness and your understanding of basic environmental issues and sensitivities, you are now empowered to do your share in helping to maintain the integrity of the environment on the construction site through environmental impact management.

Remember too, that these principles of environmental management are not only of importance on a construction site, as they can also be carried through to your daily lives, in everything you do, for better quality of life. The onus is on everyone to protect South Africa's natural resources and to maintain the sustainability for future use development and services.

For more detailed information on Environmental Best Practice Guidelines and Specifications, refer to the document set with this title, obtainable from DWAF: Directorate Water Abstraction and Instream Use; Sub-directorate Environment and Recreation (Tel: 012 336 8217).

REFERENCES

ACKERMAN, P. DWAF: SUB DIRECTORATE ENVIRONMENT AND RECREATION. PROJECT LEADER AND SPECIALIST SOURCE (PERS. COMM.).

DU PLESSIS, V. DWAF: SUB DIRECTORATE ENVIRONMENT AND RECREATION. SPECIALIST SOURCE (PERS. COMM.).

DRUYTS, F. CHIEF ENGINEER CIVIL DESIGN: DWAF. (PERS. COMM.).

HUME, P. DIRECTOR CONSTRUCTION: DWAF. (PERS. COMM.).

LEGG, K. SENIOR SPECIALIST ENGINEER CIVIL DESIGN: DWAF. (PERS. COMM.).

MATOLO-MALIBA, N. HUMAN RESOURCES DEVELOPMENT: DWAF. (PERS. COMM.).

SMITH, F. CHIEF ENGINEER: DWAF. (PERS. COMM.).

VAN RIET & LOUW LANDSCAPE ARCHITECTS. *ENVIRONMENTAL SITE MANAGEMENT AND REHABILITATION SPECIFICATIONS (ESM&RS) FOR DWAF CONSTRUCTION SITES*. APRIL 2003.