



**Sustainable Water Integrated Management (SWIM) - Support Mechanism**

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**TRAINING MATERIAL FOR DEVELOPING THE CAPACITY OF  
PROSECUTORS AND INVESTIGATORS ON IMPROVING COMPLIANCE  
AND ENFORCEMENT OF WATER & ENVIRONMENT LEGISLATIONS**

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**Table of Contents**



# 1 RATIONALE

Many countries in the Sustainable Water Integrated Management – Support Mechanism (SWIM-SM) Region are taking action to protect their scarce water resources and environment. Most of the SWIM-SM countries have developed or are currently developing Integrated Water Resources Management (IWRM) strategies and National Environmental Strategies (NES). The majority SWIM-SM Countries has practically based their IWRM and NES on legal requirements (water & environment legislation) that must be met by various sectors that use water resources and cause or may cause water pollution. These requirements are the most important foundation for an effective water and environment management; nevertheless they are only the first step. The more important second step is compliance, i.e. getting the regulated sectors to comply by fully implementing the requirements. Unfortunately, compliance does not occur automatically once requirements are issued. Achieving compliance usually involves efforts to promote, encourage, and ultimately compel the behavioral changes needed to achieve compliance. There is no magic formula for achieving compliance. There is merely trial, evaluation, and response to what works and does not work in the particular socio-economic and bio-geo-physical settings of each SWIM-SM country.

SWIM-SM countries have passed legislation for the protection of their water resources and environment with various but chiefly modest degrees of success in compliance. The main challenging problem contributing to such limited accomplishment is the lack of a comprehensive, cohesive and effective system for the enforcement of enacted legislation. In most of the cases, deficiencies of water and environment protection are not necessarily the results of poorly designed laws but to a large extent, the lack of their enforcing capacities and inadequacy of key compelling systems. Furthermore, countries suffer from ineffective enforcement regulations and measures, such as ill-defined fines and penalties particularly in the publicly owned economic sectors.

If countries fail to ensure that the policies and laws they enact are equally complied with, they will then jeopardize their own credibility as well as the validity of the law. Their sincere efforts in making water and environment policies will be wasted and water and environment laws will become “paper-tiger” or “straw-man” i.e. just words on paper with no actual improvement in water management and environmental protection. Overlooking the enforcement of water and environment legislations will undoubtedly lead to the spreading of a social value or a culture that implies “non-compliance is tolerable and compliance is not important”.

In many instance, compartmentalized legislation, which have been historically dealt with by separate national and sometimes local institutions are outdated, overlapping, ineffective, non-cohesive, and imprecise. In many instances, the government owned facilities are often found to be the most significant violators of the water and environment laws and regulations set by the same government. It has also been noticed that water and environmental legislations are often unenforceable because they are either technically inappropriate or economically unaffordable.

Compliance means the state of conformity with water and environment laws. It occurs when water and environmental legislations are met and desired changes are achieved. If these legislations are poorly designed, then achieving compliance and/or desired results will be hard if not impossible. It is traditionally known that in order to secure compliance, governments of the region should ideally take the following three consecutive activities:

- a) Issue the required water and environment requirements (laws, legislation, acts, and codes of conduct, etc.).
- b) Promote compliance through communication of legislations, publication of relevant information, consultation with affected parties, provision of technical assistance to affected parties, etc.
- c) Enforce the legislations through the following:
  - Development of the inspection capacities, credible monitoring, and accredited measuring systems to verify compliance,
  - Preparation of procedures for investigations of violations and rules for assessment of penalties,
  - Identification of the measures taken to compel compliance without resorting to formal court action, such as directions by inspectors, ticketing, and Ministerial orders, and

- Development of measures to compel compliance through court action, such as injunctions, prosecution, court orders upon conviction and civil suit for recovery of costs.

It is important to emphasize that the consequences of ignoring monitoring and enforcement issues can be disastrous for water and environment qualities and social welfare of the region. If a regulatory agency imposes a new stricter regulation but noncompliance is uncontrolled, it is possible that the ultimate result will be more deterioration in water resources and further pollution not less pollution. Alternatively, ignoring monitoring and enforcement costs might lead the government to implement a policy that is ultimately more costly than one currently in existence. High enforcement costs and imperfect compliance makes regulations less effective than desired. Thus monitoring and enforcement concerns should influence choices about how to regulate, and in some cases, about whether to regulate at all.

It is important to note that an implementable legislative regime is indispensable for effective water and environment management for sustainable development. It is particularly important not only to ensure that the network of water and environment legislations and related institutions are substantively adequate and implementable, but also that the implementing agency/agencies have the capacity in terms of human and material resources to carry out their functions effectively.

## 2 FACTORS AFFECTING COMPLIANCE WITH WATER ENVIRONMENTAL LEGISLATIONS

One of the primary goals of water and environmental enforcement is to change the present human behavior so those water and environmental requirements are adhered to. Achieving this goal involves motivating the regulated community to comply, removing obstacles that prevent compliance, and overcoming existing factors that encourage non-compliance. In many instance, the public sector (i.e. owned by the government) represents a significant fraction of the production & service sectors in the national economies. In these cases, enforcement of water and environment legislations by one government organization against another government organization is usually difficult for many reasons. For instance, monetary penalties imposed on a government-owned non-complying industry are usually paid for out of a central budget of the same government. Furthermore, the loss of such money generally has little or no impact on the individual industrial operation.

In some government systems, it might be difficult to hold managers and/or operators of publicly owned facilities accountable for failing to comply with water and environmental requirements. Generally, the managers of the publicly owned regulated facilities are receiving conflicting signals. In numerous cases a signal would come from one government organization (usually water resources and/or environmental regulating agency) requesting compliance with water and environmental requirements, meanwhile, a signal from another government organization would come demanding higher levels of production and returns regardless of the associated water degradation and environmental implications. It is very common to perceive the political difficulty of one government organization enforcing requirements against another.

Except in very few cases, citizens and/or other government organizations cannot sue government organizations for failure to comply with water and environmental requirements. For all aforementioned reasons, it appears that managers of government owned facilities may have little incentive to ensure that their facilities are in compliance with the enacted water and environmental requirements.

Among the main factors found to influence compliance with water and environment legislations we can list the following:

### 2.1 DETERRENCE:

The phenomenon of people changing their normal behavior to avoid a sanction is called deterrence. Enforcement deters detected violators from violating again, and it does deter other potential violators by sending a message that they too may experience adverse consequences for their noncompliance. Conceptually, deterrence will be very effective pending the fulfillment of the following preconditions:

- If water and environmental violations are very likely to be detected
- If the official response to violations is swift and predictable
- If the response includes a proportionate sanction
- If the regulated parties perceive that the first three conditions are serious facts.

Unfortunately, the penalty either in the form of jail sentences and/or monetary values is often determined arbitrarily and is not based on a clear methodology for penalty calculation that incorporates the deterrence proportions.

## 2.2 ECONOMICS:

The regulated community will be more likely to comply in case (1) where enforcement officials can demonstrate that compliance will save money, or (2) when the government provides some form of subsidy for compliance. To eliminate any economic gain reaped by violating water and environment requirements, the monetary penalty for violation would, ideally, at least equal the amount the facility would save by not complying. This deters deliberate economic decisions not to comply, and help treat compliers and non-compliers equally.

## 2.3 INSTITUTIONAL CREDIBILITY:

Each country has its own social norms concerning water and environmental compliance. These norms derive largely from the credibility of the laws and institutions responsible for their implementation. Government's will to enforce environmental legislation –that is to unequivocally promote voluntary compliance and identify and impose legal consequences on those who do not comply voluntarily- shape and influence the prevailing social values. A goal on the part of the governments to bring a majority of regulated community into compliance sends a message that compliance is important and helps build a social norm of compliance. The history and social norms of noncompliance can be attributed to one or more of the following reasons:

1. The enacted water and environmental laws are unenforceable due to defects in their design.
2. The institutions responsible for enforcement are lacking the political power.
3. The implementing institutions do not possess adequate resources for the enforcement.
4. Regardless of their environmental performance, some production sectors or corporate with heavy contributions to the national economies are considered to be beyond the need to comply with certain water and environmental regulations.
5. Some large-scale national development projects with significant socio-political ramifications might politically be exempt from complying with some of the ratified water and environmental laws.

## 2.4 SOCIAL FACTORS:

Personal and social relationships play a pronounced role in the implementation of water and environment legislations. A good number of regulated facilities and production entities comply with water and environmental requirements out of their genuine desire to improve the quality of life. Corporate managers of publicly owned

facilities particularly in small communities fear a loss of prestige that can result if information about noncompliance is made public.

A notable story of attainment is the often-successful friendly relationships between enforcement program supervisors and managers of the regulated facilities. Due to the lack of enforcement power and capacity, the enforcement program supervisors are usually compelled to resort to their personal contacts and public relations in order to amicably drive regulated facilities towards compliance with water and environment legislations. Although this approach showed some degree of success it is usually constrained by the desire to avoid confrontation. This desire prevents program supervisors from pursuing the full-fledge enforcement actions that may be needed to ensure compliance. Also, the enforcement official's objectivity is often compromised when he becomes too friendly, exceedingly permissible, and adequately familiar and possibly influenced by the facility's personnel and operations.

## **2.5 PSYCHOLOGICAL FACTORS:**

One of the major factors observed and common to human nature is fear of change. Most of the operating engineers believe that familiar old ways of operating are safe. Following the operation manual and maintaining the prescribed production efficiency is always given the highest priority. Any new required way to cope with water regulations and/or for environmentally friendly production is always assumed to be risky at the least. This feeling of fear is well pronounced among workers since changes might represent unnecessary and probably unacceptable risk to their job security.

Closely related to this in many cases is inertia. Many people particularly in the public sectors and/or public utilities tend to naturally resist changes because of the perceived effort it will require to enact the change. The general insufficiency of financial incentives to compensate for the extra efforts and lack of serious punishment for noncompliance are major factors promoting the persistence of this negative attitude. Both promotional efforts to publicize the benefits of compliance and the perception and reality of consequences for noncompliance play an important role in overcoming inertia.

## **2.6 KNOWLEDGE & TECHNICAL FEASIBILITY:**

In many cases, the regulated parties do not simply know that they are subject to water and/or environmental requirements. They do not usually understand what steps they have to take to achieve compliance. Furthermore, they do not have access to the necessary technology to prevent, monitor, control, or clean-up pollution and/or apply water protection measures. Lack of knowledge and technology is representing an additional barrier to compliance where water and environmental requirements are existent. This barrier can be removed if the national or local competent enforcement authorities are providing education, outreach and technical assistance to the regulated parties.

# **3 ELEMENTS OF WATER AND ENVIRONMENTAL MANAGEMENT**

Water and Environmental management has received increased attention over the last few years with the expansion of the concept of Sustainable Development (SD). Traditional ways of water and environmental management became subject to extensive revisions and analysis in view of their questionable effectiveness and validity.

Currently there are many adopted approaches to manage water resources and environmental problems and ensure compliance. The need for and scope of enforcement policies partially count upon which management approach or combination of approaches. The following is a discussion of the various approaches used or tested and accompanied by an analysis of their effectiveness in reaching compliance with the promulgated water and environmental legislations.

### 3.1 VOLUNTARY APPROACH:

This approach encourages or assists change, but does not require it. It heavily relies upon public education, technical assistance, and the promotion of water and environmental leadership. It might also include some management of natural resources to maintain acceptable environmental quality. Successful voluntary compliance programs allow governments' always limited resources to be focused on poorer performing organizations, build support for enforcement efforts, and help embed environmental concerns in organizations, making it less likely that the organizations will violate water and/or environmental laws.

Due to the often relatively weak enforcement and inspection infrastructure needed to monitor and follow-up on the voluntary water and environmental compliance, this approach is hardly used.

### 3.2 COMMAND & CONTROL APPROACH:

In the command and control approach, the regulating agency prescribes the desired changes through detailed requirements, promotes compliance with these requirements and finally enforces compliance with these requirements.

Command and control approach is the most preferred and prevailing environmental management formula. This approach is copied from the Western school of thought, particularly, from USA. Nonetheless, the Western school has perfected the implementation of this approach by:

1. developing an extensive and well-designed series of feasible water and environmental laws and acts (command - requirements),
2. by promoting compliance with these requirements, and then,
3. by establishing the appropriate inspection and monitoring capacities needed for their enforcement (control systems).

Moreover, experience gained from around the world indicates that command and control were not the ultimate solution for the proper management of water resources and environment. Command and control approaches were supplemented by a combination of other approaches such as risk-based approaches, market-based economic incentive approaches, participatory approaches, etc. These approaches will be assessed and elaborated further in the following sections.

### 3.3 MARKET BASED/ECONOMIC INCENTIVE APPROACH:

Market based/economic incentive approaches use market forces to achieve desired behavioral changes. In the developed World, economic instruments as opposed to regulatory (command and control) measures have been met with increased interest as a means of implementing the polluter-pays-principles. However, these approaches can be independent of, or build upon and supplement command and control approaches. For example, introducing market forces into a command and control approach can encourage greater compliance with water and environmental requirements and economic solutions to sustainable development problems.

The efficiency of market dis-incentives lies in achieving full costing at the micro-economic level, thus permitting individual water users and polluters to choose among a range of alternatives in matching costs with benefits. There are however, limits to the useful application of economic instruments. Command and control measures would have to be applied where acute, high-risk water resources degradation and/or environmental effects require immediate action rather than time lagged prompting through incentives.

The main instruments that can provide economic dis-incentives to developers, for the internalization of water resources degradation and/or environmental (social) costs, can fall into one of the following categories:

- Fee system, which taxes excessive water withdrawal, effluents discharges to water bodies, etc.
- Tradable permits, which allow benefiting parties to trade in water allocations, and shares, permitted effluent discharge rights with other parties.
- Offset approaches. These approaches allow a facility to propose various means to meeting water and/or environmental goals. For example a facility or agricultural developer may be allowed to withdraw larger amount of water or emit greater quantities of a substance from one of its operations if they offset this increase by reducing water withdrawal or effluent discharges from another one of its operations.
- Auctions. In this approach, the government auctions limited rights for water withdrawal or for the release certain environmental pollutants to water bodies.
- Environmental labeling/public disclosure. In this approach, manufacturers and/or producers are required to label products so that, consumers can be aware of the environmental impacts associated with their use. The consumers can then choose which products to purchase based on the products' water consumption and/or environmental performance.

### 3.4 RISK-BASED APPROACH:

Risk-based approaches to water quality and environmental management are relatively new. These approaches establish priorities for compliance and enforcement based on the potential for reducing the risks posed to public health and/or the environment.

The risk-based approach has been recently used in some countries for setting priorities for compliance and enforcement with water and environmental requirements. The capacity available for the quantitative assessment of both public health and ecological risks is extremely limited in some of the SWIM-SM countries. This limitation can be attributed to the following reasons:

1. Inadequacy of regular water quality and environmental monitoring programs that systematically measure the level of discharged pollutants and their concentrations in the ambient aquatic environment.
2. Lack of epidemiological investigations that are based on actual public exposure to various water pollutants and their potential dose-response effects.
3. Inadequacy of reliable database and information systems capable of storing, retrieving and disseminating water quality and environmental data for conducting risk assessment studies.
4. Inadequate of national expertise in the area of bio-statistics, water quality management, environmental epidemiology, environmental health and ecological risk assessment.
5. Some of the governments in the SWIM-SM Region consider risk assessment investigations and their potential communication to the public as a sensitive issue of potentially political and undesirable ramifications.
6. A large fraction of water quality and environmental data available for risk assessment studies is of questionable quality. The lack of consistent Quality Assurance/Quality Control (QA/QC) programs in water quality monitoring laboratories is the main reason for such uncertainty.
7. Background-level data on the original state of the ambient aquatic environment in some SWIM-SM countries are very limited and obstructing the accuracy of risk assessment investigations.

## 4 **CREATION OF WATER AND ENVIRONMENTAL REQUIREMENTS FOR COMMAND & CONTROL APPROACHES**

At the heart of regulatory command & control approaches are water quality and environmental requirements. These are defined as specific practices and procedures required by law to directly or indirectly protect water resources and reduce or prevent water pollution. Ensuring compliance with these requirements will evidently require enforcement.

The first step in fostering compliance is to ensure that the water and environmental requirements themselves are enforceable, i.e. that laws provide the necessary authorities for enforcement, and that requirements are clear and practical. The enforceability of water and environmental requirements has great impact on the effectiveness and cost of enforcement and on the ultimate level of compliance. For instance, enforcement programs that do not have adequate legal authority will generally be ineffective. Requirements that rely on expensive, unreliable, or unavailable technologies will be difficult or impossible to comply with. Requirements that are unclear, imprecise, ambiguous, or contradictory may be difficult to comply with.

This chapter describes the evolution and basic framework of various water and environmental requirements it also discusses the principles of the various approaches to make these requirements enforceable. The following are the vehicles often used for implementing water quality and environmental requirements.

#### 4.1 WATER QUALITY ACTS AND ENVIRONMENTAL LAWS:

Water quality acts and environmental laws provide the vision, scope, and authority for water and aquatic environmental protection and restoration. The water quality acts and environmental laws will be most effective if they provide the authorities necessary for their own enforcement. The credibility of enforcement programs will be eroded if violators can successfully challenge the authority of a program to take certain enforcement actions. Ideally, an environmental law or water quality act should provide regulating agencies with the following authorities:

- Authority to issue regulations and guidance to implement the law
- Authority to inspect regulated facilities and gain access to their records, data and equipment to determine if they are in compliance.
- Authority to require regulated communities to monitor their own compliance, keep records of their conformity and report it systematically to enforcement program.
- Authority to take legal action against non-complying facilities.
- Authority to correct situations that pose an imminent and substantial threat to water resources, public health and/or the aquatic environment.

Most SWIM-SM countries have issued water quality acts and environmental regulations giving various degrees of authority to the regulating agencies. The water quality acts and environmental laws have also established the institutional framework required for enforcement by broadly describing “who” will be responsible for implementing “what”. However, some of the water quality acts and environmental laws were not consistent, fragmented, overlapping and sometimes conflicting with existing laws issued earlier for land use planning; natural resources management; water resources conservation and protection; food safety; consumer products; occupational health and safety; pesticide use, etc.

#### 4.2 WATER QUALITY ACTS AND ENVIRONMENTAL REGULATIONS:

Regulations establish in greater detail than can be specified by water and environmental laws the general requirements that must be met by the regulated community. This might include how harmful water pollutants should be tested, registered, handled, monitored, discharged, and/or disposed. These requirements generally apply at the national level.

Most of SWIM-SM developed a number of water quality and environmental regulations (called acts) using some times the participatory approach called for by the UN. Generally, different sectors of the government are involved in the process to secure maximum participation and transparency.

In many cases, the developed water quality and environmental regulations are suffering from fragmentation. In order to avoid problems resulting from such fragmentation, it is important for SWIM-SM countries to invest in the additional efforts needed to sensitize and integrate these regulations. A very successful water pollutant discharge reduction program, for instance, can merely transfer the pollutants to another media rather than water receiving body. Successful measure to treat discharges could simply result in the creation of masses of sludge that are subsequently land-filled, causing soil contamination and underground water pollution, not to mention health and safety hazards.

A non-integrated approach also tends to encourage traditional, end-of-pipe controls (e.g. wastewater treatment units, filters, cooling towers, etc.) which not only tend to transfer pollutants from one medium to another, but which, despite considerable investment costs, bring no economic payback.

On-the-other-hand, an integrated approach in the design of the water and environmental regulations, encourages at-source, water conservation, cleaner production measures, reducing the amount of wastewater to be discharged of, minimizing energy and raw material consumption, and preventing pollutants from appearing in any other medium.

To enforce single medium regulations, SWIM-SM countries should naturally respond by developing system of single medium monitoring, inspection and enforcement. Inevitably, this causes a situation where those enforcing water quality acts are at odds with those enforcing soil or marine pollution laws. Compliance with water quality standards, for instance, might lead to reduced effluent discharges but increased mass of sludge for authorities to deal with.

A single medium approach also means that different agencies or departments are inspecting the same production facility, requiring facilities to fill out forms and provide much of the same information. This can cause confusion not to mention added paperwork, duplication of effort and disregard for public authorities' administrative complexity, and inconsistency.

Other problems, which can be caused by the fragmented requirements and implementation structures to control water pollution include:

- Impeded cooperation between water and environmental policy and other sectors policies.
- An inaccurate assessment of water pollution problems and the development of solutions that might not work.
- Failure to identify new and complex problems
- The difficulty of setting priorities among problems.

To avoid these problems, the development of an integrated approach is called for during the preparation of water quality acts and environmental regulations. The single medium focus needs to be shifted to a multiple media focus on all releases of water pollutants from their source including industrial facilities. Such an integrated approach allows water pollutants to be followed from one medium to another. One integrated permit can then be issued to each regulated facility, and integrated inspections can be conducted by a single agency or department or at least allow for real and effective coordination between media - specific agencies.

Even if the regulations themselves are still developed for a single medium, the inspection should take into consideration the total environmental impact including effects on water quality of a facility and ensure that the overall damage to the environment is minimal. This should also be reflected in the structure and organization of the inspectorate as it will be suggested in a subsequent chapter. Corrective measures within the single permitting system should ensure minimum integrated environmental damages at least.

In this connection, it is important to note that political struggles between departments within the same regulating institution can often act as a barrier in shifting from a single medium to an integrated multi-medium approach. Practical measures need to gradually be formulated and applied to overcome such interdepartmental territorial rivalry.

The types of requirements typically used with command and control approaches for water quality and environmental management are discussed below.

#### **4.2.1 Requirements in the form of Ambient Water Quality Standards:**

Ambient water quality standards (also called media quality standards) are goals for the quality of the aquatic ambient environment. These standards are usually written in units of concentration such as Parts-Per-Billion (PPB). They set maximum allowable levels of pollutants in the receiving water medium.

Ambient water quality standards are very useful in establishing environmental priorities since geographic areas, which comply with the relevant ambient standards, are considered to require no further intervention for the enforcement of environmental acts. Setting water quality ambient standards requires an explicit agreement on the environmental quality objectives that are desired and the costs that society is willing to accept to meet those objectives.

Most SWIM-SM countries have established ambient water quality standards. Due to very high cost and the lack of technical capacities necessary for the development of environmental standards, most of the ambient standards were not developed by SWIM-SM countries but rather adopted from other places. The main resources used for the extraction of recognized environmental criteria and standards in the SWIM-SM Region were from the European Union, US-EPA standards, and/or Canadian-EPA standards. Internationally recognized standards recommended by United Nations organizations such as World Health Organization (WHO) were also utilized.

In most of the cases, national committees of local experts were formed under the auspice of the national competent water resources and environmental authorities to study, analyze and then adopt the suitable ambient standards that are most appropriate to their specific environmental settings. Priority in most of the cases was given to the development of primary ambient water quality standards with the aim of protecting the public health and reducing the health hazards associated with human exposure to harmful substances. During the selection process of primary ambient water quality standards, issues such as the techno-economic feasibility and societal costs associated with the enforcement of the adopted standards were not given enough weight of considerations. Moreover, management systems, implementation modalities and capacity necessary for monitoring and inspection were not given the proper weight or attention they deserve.

#### **4.2.2 Requirements in the Form of Performance Standards (Effluent Standards):**

Effluent standards are widely used for regulations, permits, and monitoring requirements for wastewater effluents. Performance standards limit the amount or rate of particular pollutants or discharges that a facility can release into the aquatic environment in a given period of time. They provide flexibility because they allow sources to choose which technologies they will use to meet the standards. Often such standards are based on the output that can be achieved using the Best Available Technology (BAT). Sampling and monitoring are the only means to measure compliance with emission standards. Depending on the kind of control or monitoring equipment required, compliance can be difficult and/or expensive to enforce.

Effluent or performance standards come next in importance to ambient standards. At the current stage, emission standards in some countries of the SWIM-SM region might be inadequate and do not cover the wide spectrum of complex and modern pollutants discharged to the natural aquatic environment of the region. This case is particularly true when chemical industries, petrochemicals, pharmaceuticals, electronics and other non-conventional modern industries recently established in the SWIM-SM Region are carefully thought about. The lag in the development or adoption of effluent standards, as compared to ambient standards, might be explained by one or more of the following elements:

1. Inadequate water quality and environmental information, database, and inventories on industrial processes and their associated effluent discharges to the aquatic environment.
2. Fragmentation of authorities controlling water resources and environmental aspects.
3. Lack of national expertise in the area of environmental risk assessment of discharged pollutants; identification of their potential toxicological and environmental effects; identification of their technological control measures; and development of environmental management systems.
4. Inadequate water quality and environmental monitoring laboratories needed for the characterization of discharged pollutants and their potential transformation in the natural aquatic environment.

5. Limited experience in the assessment of total pollution loads discharged or released from various point and non-point (fugitive) sources of pollution.
6. Inadequate expertise in mathematical simulation modeling to project the transport, dispersion, dissipation and dilution of the discharged pollutants to propose threshold limits for emission.
7. Lack of experience in relating discharge loads to impacts on ambient water environment and to define its assimilation capacity.

Alternatively, emission standards can be established by estimating the discharges that are compatible with ensuring that, receiving areas around the discharging facility meet the ambient standards defined for the pollutants. However, this will require both considerable information on both the sources and the ambient environmental quality and will vary from one area to another.

#### **4.2.3 Requirements in the Form of Technology Standards:**

Technology standards require the regulated community to use a particular type of technology such as BAT, or more recently Best Practicable Technology (BPT) and Best Available Technology Not Entailing Excessive Cost (BATNEEC) to control and/or monitor wastewater discharges. It is relatively easy for inspectors to determine whether facilities are in compliance with the technology standards by simply observing if the prescribed equipment are in place and operate properly.

The performance of EIA policies might be the perfect modality for incorporating technology standards in the adopted command approach. In EIA, the potential impacts of projects are identified and then minimized through alternative choices. It is at this stage where regulating agencies can command or require certain technology to be incorporated as a precondition for approving the submitted project. The requirement should also specify the kind of technology, its required performance standards, and the sort of monitoring and reporting requisites.

#### **4.2.4 Requirements in the Form of Practice Standards:**

These standards require or prohibit certain work activities that have significant impacts on water quality and environment. Like technology standards, it is easy for enforcement officials to inspect for compliance and take action against non-complying sources, but difficult to ensure ongoing compliance.

Practice standards are widely recognized and implemented in the management and control of hazardous chemicals manufacturing and its associated wastewater discharges.

#### **4.2.5 Requirements for Reporting Information:**

These requirements are very different from the standards described above in that they require a source of potential water pollution to regularly generate and report information to the regulating authorities. Sources discharging pollutants in water bodies might also be required to monitor, report, and maintain records of the level of discharged pollutants and whether or not it exceeded performance (effluent) standards.

Practically, the duty of monitoring and inspection in such a case is carried out by the regulated party itself. It is important to note that no matter how much budget and resources are allocated for monitoring and enforcement by governments, the necessity of relying on a well designed and managed self-monitoring, self-auditing, and self-reporting programs is becoming indispensable. Self-monitoring programs are originally designed to monitor, document and report compliance with all regulating discharge (effluent) standards set by the regulator.

#### 4.3 WATER AND ENVIRONMENT PERMITS AND LICENSES:

Water and environment permits are usually designed to control activities related to construction or operation of facilities that generate water pollutants. The requirements in permits are often based on specific criteria established in laws and regulations. Licenses are similar to permits but issued to manufacture, test, sell and/or distribute a product, such as pesticides and fertilizers that may pose an environmental or public health risk if improperly used.

These forms of requirements are widely used at both the national and local levels in most of the SWIM-SM countries. The main reasons for such widespread use are the versatility; flexibility; centrality; and the minimum administrative and technical requirements needed to enforce water and environmental permits and licenses.

In most of the cases, the applying facility provides information about its operations and discharges to the permit department at the local municipality. The permit official reviews the information and requests additional information if necessary. He may provide the opportunity for any concerned party to comment on whether the applying facility should be granted a permit and what the requirements should be. After sufficient information gathering, discussion, and negotiation, the permit writer decides whether to issue the permit or license. In some SWIM-SM countries specific sanction are applied if the permit officials discover that the applicant submits false, incomplete, or misleading information.

#### 4.4 ENFORCEABILITY OF WATER AND ENVIRONMENT REQUIREMENTS

The requirements, particularly in the form of regulations, will be most effective if they closely reflect the practical realities of compliance and enforcement. Ideally, requirements should fulfill the following provisions:

- Are clear and understandable
- Accurately define what sources or activities are subject to the requirements.
- Precisely define the requirements and the conditions for any exceptions or deviation from these requirements.
- Clearly define how compliance is to be determined by specifying test methods and procedures.
- Clearly state deadlines for compliance.
- Are flexible enough to be constructively adapted through individual permits, or licenses without jeopardizing their credibility.
- Are based on control and monitoring technologies that are available, affordable and reliable.
- Are drafted clear enough to be the basis of criminal prosecution (considered as the most serious enforcement action).

In many cases, the ease and cost of compliance greatly affect the degree of compliance. Despite the sincere desire of the regulated community to comply, they will not be able to if the requirements are too expensive or the necessary technologies are unknown or not available. It is then up to the decision-makers at the regulating agency to balance between the desire to create stringent and ambitious requirements on one hand and the burden the requirements will create to the regulated community on the other. It has been the assumption of some regulators that more stringent requirements will ultimately lead to larger and quicker environmental protection and restoration. However, experience showed that too stringent programs yielded disrespect for the requirements regulated communities who are making the compliance decision in the field. This has also caused challenges and delays in the few cases taken to courts of law. This imbalance between stringency and feasibility has hampered and seriously undermined the credibility of the enforcement programs. Furthermore, the regulated communities were overwhelmed and overburdened by the abrupt and non-progressive way of imposing the water and environmental requirements.

It is therefore recommended for regulators to creatively cater their requirements to be based on factors such as size, assimilation capacity of surrounding environment, pollution loads, environmental and public health risks

posed by the regulated communities. It is also recommended that requirements be gradually implemented in a phased approach to facilitate compliance. The first phase involves the less stringent requirements with minimum burden on the regulated facilities. Sometime later, a second phase involving more stringent requirements can be implemented.

#### **4.5 HOW TO ENHANCE ENFORCEABILITY OF WATER AND ENVIRONMENT REQUIREMENTS:**

The following are proposed approaches (successfully used in other parts of the world) to help ensure that the water and environmental requirements are enforceable.

##### **4.5.1 Improve the Climate for Compliance:**

Two simple practices that often invite the respect of the regulated community and improve the climate for compliance can be easily practiced as follows:

- By demonstrating value through recognized scientific methods to illustrate that a requirement will produce measurable environmental improvements.
- By demonstrating options and feasibility through provision of technical information on means and technologies that will produce compliance.

##### **4.5.2 Identify the Size of the Regulated Community:**

Regulating authorities should recognize that the size of the regulated community could influence the program's ability to successfully enforce general requirements. The larger the community, the more difficult effective enforcement will be. An extremely large regulated community can make it impossible to implement and enforce requirements. In such a case, it is advisable for environmental regulating authorities to focus and regulate the smallest link in the chain (manufacturer, distributor, and users) to achieve the desired environmental performance with minimum effort.

##### **4.5.3 Analyze the Ability to Comply:**

Both economic and technological factors determine how great a burden the new requirement will pose to the regulated community. In such specific cases, regulating authorities should commission independent investigations to examine what economic and technological impact regulation will have on that particular regulated community. Factors to be considered include the type of facility, equipment required for compliance and monitoring, cost of changes in practice, long-term economic impacts, cost for self-monitoring-reporting, feasibility and reliability of the required technology, etc.

##### **4.5.4 Involve the Regulated Community and Other Stakeholders in Developing the Requirements:**

A good number of regulating water and environmental authorities has involved the regulated community in the process of developing requirement. This participatory approach helps in the creation of support and reduced resistance and conflict. It also made requirements more practical and therefore more enforceable, and it publicized the requirements at an early stage, which set the floor for compliance.

The participatory approach is often limited to informal negotiations by participating in sectoral committees and formal comments by publishing the drafted regulations and soliciting comments of the regulated communities. Field testing to verify whether the requirements are clear, understandable, cost effective and techno-economically feasible is seldom practiced by the regulating authorities.

#### 4.5.5 Involve Enforcement Officials:

It is customary to find that personnel involved in drafting water and environmental requirements are not connected to the enforcement activities. It is therefore evident that the experience, wisdom, and concerns of both the technical and legal staff involved in enforcement are not readily available to the regulating agencies. It is often the case that enforcement officials were only requested to enforce the requirements without providing them with the proper legal or technical aspects associated with the issued regulation.

This common practice has deprived the regulating authorities from the non-compliance lessons learned by enforcement officials in enforcing earlier requirements.

## 5 PROMOTION OF WATER AND ENVIRONMENTAL REQUIREMENTS AND THEIR MEANS OF COMPLIANCE

Once created, promotion of water and environmental requirements and producing means for their compliance are always considered as an inherent part of any successful enforcement strategy. Compliance promotion is defined as any activity that encourages voluntary compliance with water and environmental requirements. It helps overcome some of the compliance barriers discussed earlier. Most compliance strategies involve both activities to promote and enforce requirements. Policymakers need to determine and implement the most effective mix of compliance promotion and enforcement response.

Experience from around the world has shown that promotion alone (carrot alone) is often not effective. Enforcement (stick) is important to create a climate in which members of the regulated community will have clear incentives to make use of the opportunities and resources provided by promotion (carrot). Experience has also shown that enforcement alone (stick alone) is not as effective as enforcement combined with promotion (carrot + stick). This is particularly true due to the following reasons:

1. The number and size of the regulated communities far exceed the regulating authorities program's resources for enforcement, e.g., when regulated community consists of numerous polluting sources such as large industrial complexes, small and medium size industries, large number of mechanic shops and gas stations, etc.
2. Due to the economic factor involved, the regulated community is usually reluctant to comply voluntarily.
3. The existence of a cultural resistance to enforcement and a social show of superiority by noncompliance to regulations.

This section describes some of the attempts to promote compliance with the passed water and environmental regulations. According to experience from other parts of the world, it is believed that compliance through information, education and other means is an effective tool in securing conformity with the law. As a part of their comprehensive initiative, SWIM-SM countries should promote compliance with their water and environmental legislation and acts through a combination of the following measures:

### 5.1 FIRST: BY EDUCATION, INFORMATION DISSEMINATION AND TECHNICAL ASSISTANCE:

Education, information dissemination and technical assistance lay the groundwork for voluntary compliance. They are essential to overcome barriers of ignorance or inability that otherwise lead to noncompliance. Education and technical assistance make it easier and more possible for the regulated communities to comply by providing information about the requirements and the modalities of meeting them. Provision of technical advice helps the regulated parties take the

necessary steps for compliance. Education and technical assistance are particularly important in the early imposition stages of new requirement-based program, and whenever the program requirements are amended.

In most of the cases, enforcement authorities failed to conduct the proper education and technical assistance campaigns needed to promote compliance of their water and environmental regulatory programs. This is chiefly attributed to the lack of perception and adequate resources, resulting in deficiency of information needed to establish sound enforcement programs. It is often the case that the regulating agencies are not in a position to disseminate information on:

1. The parties subject to their requirements,
2. The exact requirements in each case,
3. Why these specific requirements are important?
4. What changes (including technical and managerial reforms) must be made to comply with the requirements?
5. How these changes can be made (e.g. what equipment or technologies should be used?) and
6. What is the grace period, and what are the consequences of not complying?

Regulating agencies that are maintaining enforcement programs consider deterrence as one of their important elements. The atmosphere of deterrence is supposed to provide an incentive for regulated parties to sincerely seek assistance for compliance. Nevertheless, the necessary information needed to create such “atmosphere of deterrence” was never made available or communicated to the regulated parties in most of the cases. The following section is providing an analysis and assessment of the various means of assistance the regulating agencies can be providing to the regulated parties to help actualize their compliance.

#### **Means of Providing Information and Assistance to the Regulated Parties.**

- **Publications:** Such as brochures and guidance manuals, created specifically for educational purposes, and distributed or made available to regulated groups. These are the most common used means for dissemination of information to the regulated communities. However, the amount and quality of disseminated information is very limited. In most of the cases, these publications provide a narrow description of the water and environmental requirements and devoid of any technicalities on the means for compliance. The distributed publication has the dual-objective of informing regulated communities and more important the self-advertising for the regulating agency. In many cases, these publications are unfortunately used to publicize the achievements and justification for the mere existence and spending of the regulating agency to the society.
- **Training Programs:** These are programs designed specifically to educate the regulated community about water and environmental requirements and compliance.
- **Conferences:** Following the issuance of water and environmental legislations, orientation conferences need to be held to bring together officials from the regulating agency, the regulated communities and stakeholders. These conferences should be designed only to inform the regulated parties on the content and effective date of the new legislation. Unfortunately, it is often the case in all these conferences; enforcement officials play a minor role in providing guidance or assistance on the proposed means for compliance.
- **Hot-lines:** These are known dedicated telephone numbers that the regulated community can call to ask questions and receive information and assistance.
- **Technical Assistance:** There are three means by which technical assistance can be provided. **(1)** By trained personnel who are made available by the regulating agency to visit individual members of the regulated communities and assist them taking the necessary changes for compliance. **(2)** By inspectors who provide technical assistance as part of their inspection. This service is partially usually provided by regulating agencies but on ad-hoc bases and subject to the, experience, mood, views, attitude and personality of the assigned inspectors. **(3)** By special assistance programs, set up for example at academic institutions and research centers that provide a central resource for information on and assistance with compliance. This is the most widely used means of acquiring information and assistance by regulated communities. It is considered, as the last resort for the regulated groups to obtain

information on the proper technical measures needed for their compliance. This source of information is not provided free of charges. In many cases, the regulated parties are overcharged for information that can be easily accessed much cheaper from other sources.

- Cooperative arrangement: These are programs by which program officials can facilitate cooperative arrangements among small businesses that may want to comply but do not have the necessary resources to do so. The management authorities in many of the industrial zones, cities and complexes have constructed central wastewater treatment units, and in some cases processing centers for pollutants that must be controlled or recycled. In some cases the services provided by these centers are provided free of charge to stimulate industrial investments. However, in most of the cases a service charge, that commensurate with the nature and strength of the discharged pollutants, is imposed on the regulated parties.
- Media Announcements: This sort of information is widely used in the West to distribute information through newspapers, television, or radio. This can include information about requirements, ways to meet requirements, and enforcement activities. The use of media to disseminate reports of enforcement has proved to be very effective in deterring other potential violators and in creating public pressure for compliance. In SWIM-SM region, apart from very few generic articles in the local newspapers regarding the promulgated water and environmental requirements and some unspecified cases of noncompliance, the media at large is hardly used to inform about water and environmental requirements, the ways to meet them and the corresponding enforcement activities.
- Academia: Universities and research institutions play a pivotal role in educating the regulated community through their conferences and publications.

In this connection, it is important to note that promotion of compliance can be developed or enhanced by establishing a communication plan which specifies the type of information that should be communicated, how it should be developed, when it should be released, and how it should be distributed. Similarly, a technical plan can be developed to indicate what assistance should be provided, to whom, and under what circumstances.

Water and environmental authorities should continue to strengthen their cooperation with the National Research Institutions, academia, industries, International and Regional Organizations such as UN (UNIDO, UNEP, UNDP, UNITAR, ESCWA, UNESCO, ILO, IAEA, etc.) on policies for enforcing relevant legislations. This fostered cooperation should lead to the promotion and development of new, clean and environmentally sound technology as well as the evaluation of existing technology in use in the world, to facilitate its adaptation and application.

It is the duty of national competent water and environmental authorities to provide the other Government agencies, the private sector, and local municipalities, with the technical information on the following:

- Best means for pollution abatement
- Control measures to prevent releases of substances into the aquatic environment
- Approved standard methods for analysis and monitoring

## 5.2 SECOND: BY BUILDING PUBLIC SUPPORT & PARTNERSHIP:

The public can be a powerful associate in promoting compliance with the issued environmental requirements. They can also serve as watchdogs that alert officials to undetected cases of noncompliance. In addition, public support can create a social ethic or culture of compliance.

Regulating authorities should consider the idea of providing the authority to members of the public or NGOs to bring citizen suit against non-complying facilities. Furthermore, NGOs can independently promote compliance by publicizing information to increase public awareness of water and environmental problems and build support and pressure for compliance. NGOs may also become involved in enforcement by detecting noncompliance, commenting on government enforcement actions, and where the law allows, taking legal action against a violator for noncompliance or against the government for not enforcing the requirements.

Although, public participation and support are viewed in the developed world as indispensable for achieving compliance with water and environmental regulations, many government agencies are neither willing nor able to cooperate with their citizens in this domain. In some SWIM-SM countries the level of public participation is limited

to very few NGOs with water and environmental interests and concerns. However, most of the regulating authorities have a legacy of paternalistic or technocratic, if not authoritarian, relations with their public and the relevant NGOs.

### 5.3 THIRD: BY PUBLICIZING SUCCESS STORIES

Publicizing success stories of compliance, by selected facilities that have been successful in achieving compliance, can provide an incentive for the rest of the regulated community. With the prevailing wave of water and environmental concern and awareness in the SWIM-SM Region, positive publicity about a firm's compliance success can enhance its reputation and public image. It can also create a positive social climate that encourages compliance.

Publicizing success stories in water and environmental compliance is very common particularly when it involves certification for an ISO-14000 series. This sort of environmental compliance promotion is not carried out or sponsored by the regulating agency. It is the complying facility that usually sponsors these publicity campaigns through paid advertisements in newspapers and television. Apart from diminishing the credibility of the publicized success story, such campaigns are exploiting the water and/or environmental issues for commercial promotion rather than for promoting compliance. The paid advertisements are in fact catered to publicize the facility self-assessment of its own environmental performance and are often oriented towards polishing the firm's public image.

### 5.4 FOURTH: BY DEVELOPING ECONOMIC INCENTIVES:

An obvious economic reason for compliance is that regulated communities normally respond to both positive and negative incentives. If expected penalties are sufficiently high, the threat of being punished for noncompliance should be an adequate reason for compliance. However, imposing negative incentives requires strong, constant and credible monitoring and reporting. Moreover, even if discovered to be in noncompliance, associated fines and fees are often either low or do not commensurate with the damage inflicted to water and/or the environment.

Regulating agencies can encourage compliance by providing economic incentives for compliance. This is the most effective approach to publicly owned facilities which are less likely to be deterred by monetary penalties, since they are funded by the government. The benefit from compliance can be applied to the facility generally, or even to an individual based on his or her performance. Economic incentives might include:

- Fees: In this case, the facility is charged based on the amount, rate and toxicity of its effluent discharges. Unlike monetary penalties, fees create an immediate cost to the regulated community for polluting, and they generate revenue that can be used for enforcement programs. Fees should be high enough to deter pollution, otherwise they might be considered as license to pollute.
- Tax Incentives: These are reduced taxes for costs associated with improving water quality and/or environmental performance by installing pollution control equipment, or reforming a process to avoid pollution.
- Subsidies for Complying Facilities: This incentive provides communities that comply with requirements a subsidy to help defray the cost involved with their compliance efforts. Some simple practices such as awarding annual trophies, citations and titles to regulated community with good environmental compliance records in recognition to their exerted efforts yielded good results.
- Facility or Operator Bonuses: These bonuses are given to the facility or operator who is achieving better results than originally specified in the water and/or environmental requirements.
- Promotion Credits: These are incentives given to senior managers in government owned facilities that are achieving compliance with water and environment regulations.

Banking and insurance industries are also becoming increasingly aware and directly involved in enforcement by requiring assurance of compliance with water and environmental requirements (particularly in the preparation of EIA of large-scale projects) before they will issue a loan or insurance policy to a facility.

## 5.5 FIFTH: BY BUILDING FOCAL POINTS WITHIN THE REGULATED COMMUNITIES

Western societies are promoting the concept of establishing internal Environmental Management Systems (EMS) within the regulated community to promote compliance and generally improve environmental including water quality. One of the main fundamental aspects of building internal EMS is the performance of environmental auditing.

Environmental audits are internal evaluations by companies and government agencies, to verify their compliance with legal requirements as well as their own internal policies and standards. They are conducted by companies, government agencies and others on voluntary basis, and are carried out by either outside consultants or employees of the company or facility from outside the work unit being audited. Audits can identify compliance problems, weaknesses in management systems, or areas of risk. The findings are usually documented in a written report.

Environmental auditing of the regulated community should be conducted on regular basis. Regulating agency should recognize and make use of the power and effectiveness of environmental audits as management tools for regulated communities. An environmental audit can provide a clear view on the need for different management changes relevant to water and environmental compliance as follows:

- Development of a formal water and environment compliance plan or policy.
- Education and training programs aimed at compliance with water and environmental requirements.
- Budgeting and planning for water and environmental compliance.
- Purchase, operation, and maintenance of equipment needed to achieve compliance with water and environmental regulations.
- Developing monitoring, record-keeping, and internal and external compliance and noncompliance reporting systems.
- Developing internal communication and chain-of-command systems to ensure compliance.

In order to encourage the practice of environmental auditing, inspections and investigations should be conducted in a manner, which should not inhibit the practice or quality of auditing. Inspectors from regulating authorities should not request environmental audit reports during routine inspections to verify compliance. Access to environmental audit reports may be required only when inspectors or investigation specialists have reasonable grounds to believe that:

- An offence has been committed
- The audit's findings will be relevant to the particular violation, necessary to its investigation and required evidence
- The information being thought through the audit cannot be obtained from any other source through the exercise of the inspector's or investigation specialist's powers.

Regulating authorities should also inform regulated communities and government agencies that environmental audit reports should not be used by any mean to shelter required monitoring, compliance or other information that would be accessible to the inspectors.

## 6 **MONITORING COMPLIANCE WITH WATER AND ENVIRONMENTAL REGULATIONS**

Monitoring compliance is the most vital element of any enforcement program. Monitoring compliance by collecting and analyzing information on the compliance status of the regulated communities is fundamental for the following reasons:

1. It detects and corrects noncompliance
2. It assesses the enforcement program progress
3. It provides evidence to support enforcement actions

Regulating authorities usually start enforcement by designing a national compliance strategy. This strategy should be based on the following two basic elements:

**Element one** involves the establishment of a water and environment compliance monitoring program, which sets out the priorities and rationale for conducting on-site inspections and other types of compliance monitoring.

**Element two** involves the establishment of a water and environment enforcement response policy, which details the appropriate level of enforcement action associated with the many ways that a regulation can be violated. This enforcement policy should also detail the principles and rationale for determining the seriousness of various types of violations as factor in assessing penalty amounts. This element will be discussed in much further details in the next chapters of the manual.

In general there are four main sources of compliance information that water and environmental authorities can develop, promote, institutionalize, and rely upon. These sources can be categorized as follows:

## 6.1 INSPECTIONS BY PROGRAM OFFICERS:

Inspection is defined as the process by which inspectors determine that a facility is in or out of compliance, including examination of records, quality of discharges, and other conditions. It is considered as the backbone of most enforcement programs. Inspections are usually carried-out by government officials such as inspectors affiliated with water and environmental regulating authorities or independent contracted accredited third parties. Inspectors plan inspections, gather data in and around a particular facility, record and report on their observations, and sometimes make independent judgments about whether the facility is in compliance. It conceptually provides the most relevant and reliable information. However, it requires unaffordable extensive budgets, technical and managerial resources to be carefully targeted and planned.

To conduct an inspection of a premise, the inspector must have reasonable grounds to believe that, in the premise that he intends to enter and inspect, there are activities, materials, substances, records, books, electronic data or other documents that are subject to the requirements or relevant to their administration.

### 6.1.1 **Types & Levels of Inspection:**

Inspection may be an announced-routine if there is no reason to suspect the facility is out of compliance, or it can be an unannounced targeted inspection if there is reason to believe that a facility is out of compliance. Inspections should focus on one or more of the following aspects:

- Whether the facility has an up-to-date permit or license
- Whether water pollution control equipment are installed
- Whether the installed equipment are operational
- Whether the facility practices support the required compliance activities
- Whether there are signs of willful violations and/or falsification of water and/or environmental data (volume and concentration of contaminants in the discharged effluent)

There are several inspection levels that water and environmental regulating authorities should consider when designing their systematic compliance program. These are:

1. Walk-through Inspection: It consists of a tour of the facility by a skilled and experienced inspector. It would include:
  - Noting the existence of pollution-control equipment,
  - Observing work practices and housekeeping, and
  - Checking the record repository.
2. Compliance Evaluation Inspection: In addition to what has been mentioned in walk-through inspection, it would include
  - A review and evaluation of the records,
  - Interviews with facility personnel,
  - Determining the details about pollution control systems and devices in place and
  - Possible collection of a grab sample of the effluent for quick analytical checks.
3. Sampling Inspection: It includes, in addition to the activities listed in the above two inspections, a preplanned sample collection to be conducted in duplicate sampling and analysis performed by the owner or operator. Split samples will confirm or refute the reported compliance data. Sampling inspection can also be used to document the extent of water contamination or environmental damages.

#### 6.1.2 Authority that should be Given to Inspectors by the Water and Environmental Regulating Agency:

In the course of inspection, the inspector may examine, flow records, water meters, substances or products, wastewater effluents, discarded solid waste, containers, or packages and take samples. The Government inspector may also examine books, records or electronic data and make copies of them. If during an inspection, the inspector discovers a violation, his or her response should be determined by the nature of the offence (including the degree of harm or potential harm to water quality and environment) and by the compliance history of the company, individual or government agency.

How can we build inspection capacity?

#### **Step I: Regulating Authorities Locate the Resources Needed to Set-up Water and Environmental Inspectorate.**

The resources that are required to set-up an environmental inspectorate would always be reflecting the size and complexity of the various economic sectors. There are, of course certain fundamental resources needed in order to have at least the beginnings of a functional and effective inspectorate which can carry-out integral inspections. However, steps can be taken with minimal personnel and resources if priorities are well defined and real political-will does exist. Fundamental infrastructure needs are as follows:

- Trained staff to conduct integrated inspections of regulated communities.
- Infrastructure with administrative and criminal prosecuting authorities (police, public prosecutor, municipalities, central government).
- Logistics and support equipment - e.g. vehicles or alternative transportation facilities, field sampling equipment, instruments and gears for rapid field assessments.
- Accredited laboratories for reliable and comprehensive water and environmental analysis
- A functional administrative system to document, follow-up and keep records of inspections. Documentation equipment might include video cameras, film, logbook, and tape recorder to record information and evidence.

- Safety equipment to protect the inspector from hazards that may be encountered during inspection.

Obviously, the analysis of physical samples of effluents and wastewater will require more resource-intensive facilities. However, direct sampling might be necessary when specific water quality and/or environmental problems have been identified or, when periodic or continuous checks of the environmental quality of water have to be undertaken. This will require:

- Specialized skilled personnel to conduct direct sampling and analytical measurements
- Certified or accredited environmental laboratories to physically analyze samples of water, wastewater, and other environmental matrices according to recognized standard procedures.
- Rapid impact and risk assessment teams.
- Availability of operational emergency teams and tested contingency programs.

Where resources are not available for an inspectorate to hire specialized personnel, other alternatives should be found. For example, reputable private sector might be contracted to do the inspection and external environmental auditing work. However, an accreditation, certification and/or inspection systems should also be established to control the quality performance of these contractors.

#### **Step II: Regulating Authorities Identify the Functions of the Developed Water and Environmental Inspectorate.**

The functions of a water and environmental inspectorate are identified and should be catered based on the local situation in each individual SWIM-SM country. Factors to be considered in this connection are the availability of laws, standards, guidelines and policies for environmental auditing, licensing and enforcement powers. The functions of an inspectorate at the regulating authorities can be gradually upgraded and properly defined in phases as follows:

1. Present State: The suggested function of the inspectorate in the present case should be centered on advising, planning, assisting but not policing.
2. Near Future State: In this phase it is assumed that comprehensive water and environmental requirements and standards are formulated and the codes of practice are developed and more enforceable prescriptions are insinuated. In such a case, the function of the proposed inspectorate should be less as a regulating authority adviser that assists only on request and will start more as a real inspector. As a result, the inspector should advise on inspection and enforcement. The inspector should show that he can be tougher unless changes are made in a proper time (it might be advisable that the inspector be a different person than the one in step 1). He should act not as policeman, but he should rather be very strict in his approach, very consistent in action, and predictable.
3. In the Future: In the future it is assumed that all licensing procedures are functioning; laws, water and environmental requirements and codes of practice are approved and passed; standards and regulations are known, registration is fully developed. In this case the regulating authorities inspectorate would require reports, results, actions more or less voluntary but if not, the regulating authority inspectors start acting like policemen. Strong warnings, tickets should be given, and public prosecutor can be involved.
4. Ultimately: When enforcement mechanisms are in place, the regulating authority's inspectors would conduct compliance testing either within the inspectorate or via independent accredited third party. This might involve checks for discharges (ERA can resort to private sector or local research institute), and checks on accountants book to investigate costs of disposal, treatment technologies, cost of operation of water and environmental laboratories etc.

All these actions and especially step 3 and step 4 require very highly skilled inspectors with extensive background in environmental engineering or science.

#### **Step III: Regulating Authorities Identify the Overall Tasks of the Proposed Inspectorate.**

The tasks of an inspectorate usually evolve in a number of steps according to their particular situations. These situations might start from where there are no comprehensive water and/or environmental requirements and an ill-informed regulated community to one in which the community is well informed of its obligations in complying with well-established water and environmental requirements.

The tasks of the water and/or environmental inspectorate will thus vary according to the stage of development of water and environmental requirements. But essentially, these tasks can be summarized as follows:

1. Provide response and advice to permit applicants, communicate with the licensing authorities during the planning stage of the new facility, or during the preparation of a rehabilitation scheme.
2. Assist the licensing authorities to define the content of water and environmental permits.
3. Advise and assist the operator of regulated communities to comply with the regulations on the occasions of the inspection.
4. Define and impose remedial actions if necessary. Apply or recommend sanctions if needed (fine, fees levied against the company corresponding to the amount of money the regulated community made while avoiding compliance).
5. Follow-up results of monitoring on the occasion of the inspections. Consolidate the results of the monitoring activities.
6. Prepare and maintain records on inspections made, observations, taken actions, results of sample analyses and other relevant information. Sound record keeping is not only essential for effective inspectorate responsibility, but also as material for future enforcement activity (e.g. court case) if systematic violations of a permit occur.
7. Prepare and disseminate information to the regulated community on the regulations and on the currently available environmentally sound technologies.
8. It is also important for the inspectorate to play a role in keeping the public informed about the water quality and environmental situation, pollutants discharged, eventual hazards, existence of emergency response plans, etc. If kept well informed, the public and NGOs can provide an influential and sometimes silent pressure on regulated communities to ensure that water and environmental regulations are respected by industry.
9. Finally, it is the implicit task of inspectorates to encourage voluntary compliance of the regulated communities by promoting sound environmental and water quality management practices.

#### **Step IV: Regulating Authorities Train Inspectors.**

Water and environment inspectors require training in a broad range of skills such as technical, legal, administrative and communication. The training programs should be based on a clear needs identification and gap-filling strategy. They shouldn't be provided on an ad-hoc basis and should be catered or focused to reflect the real obligations related to the enforcement of enacted local water and environmental requirements. The water and environmental inspectors need to be technically competent in the subjects of inspections they perform, and skilled in obtaining crucial facts and in collecting and preserving credible evidence of noncompliance. They also need to be skilled in working in teams, in effective communications ranging from entry conversations to complex cross-examination and, in serving as expert witnesses at enforcement proceedings.

#### **Step V: The Regulating Authorities Identify the Financial Appropriations for the Developed Water and Environmental Inspectorate.**

In the developed world, the financial resources required for existing inspectorates, are usually raised through taxes or fees based on the polluter- pays-principle (e.g. discharge fees, fossil fuel taxes). However, due to the current circumstances prevailing in the region, it is always advisable that the central governments, through their regulating authorities, start by providing the needed resources for the establishment of the inspectorate. There is no reason why

over time, a significant proportion of the costs of the water and environmental inspectorates cannot be gradually recovered from regulated facilities through one of the following mechanisms:

- 1- Permit Charges: In France and the UK, for example, the fees paid by each permitted plant cover the costs of inspectorates. In the Netherlands, central government resources provide the financial requirements of the inspectorate.
- 2- Financial Penalties: Financial penalties for persistent non-compliance, in addition to their deterrent role, can also contribute to the operation costs of an inspectorate. The system of levying fees for pollutant discharge means that the regulated facilities discharging pollutants, or discharging pollutants in excess of the prescribed discharge standards, should pay an amount of fees according to regulations and discharge standards for eliminating and controlling pollution. In this case the polluter shall pay the fee within a prescribed period, if not, he shall pay an additional fee for such a delay, or otherwise be taken to the proper court for compulsory enforcement. The payment shall not exempt a polluter from responsibility for eliminating and controlling the pollution, and compensating for the damage incurred and also other liabilities provided by the legislation.

Virtually any enforcement program, no matter how adequately funded, will never have enough resources to inspect all regulated facilities. Therefore, the major issue to be considered in creating an inspection program is how to target the scarce inspection resources to achieve maximum effect. Another strategy for conserving inspection program resources is to use what has been recognized in USA as “tiered inspection”. In this inspection, regulating authorities will start with the least expensive inspection. If the regulated facility is found to be in violation, the regulating authorities will take action to require the facility to correct the violation and do self-monitoring & reporting. The same facility will again be subject to more intensive unannounced inspection. This approach is assumed to shift some of the burden of data gathering to the regulated facility. It also postpones resource-intensive inspections until lower-level inspection and monitoring warrant the expense.

## 6.2 SELF-MONITORING, SELF-RECORD-KEEPING & SELF-REPORTING:

Self-monitoring, record-keeping, and –reporting are three essential ways in which sources can be required to track their own compliance and record or report the results for regulating agencies review.

- In self-monitoring, the regulated communities measure a discharge or performance parameter that provides information on the nature of pollutant discharges or the operation of control technology. For instance, a regulated facility might be asked by the regulating agency to sample and measure wastewater effluent of a certain pollutant. Regulated facilities may also be asked to monitor operating parameters on pollution control equipment (voltage, electric current used, etc.). These parameters can be used as indicators on how well the equipment is operating. This sort of parameters are generally inexpensive to monitor and more reliable than occasional sampling and analysis of the effluent itself.
- In self-record-keeping, the regulated facility is responsible for maintaining their generated records of a certain regulated activity (shipment of hazardous waste, self-monitoring data, etc.)
- In self-reporting, the regulated facility is required to provide the regulating agency with self-monitoring or record-keeping data periodically and/or upon request.

The self-monitoring, record keeping and reporting provide much more extensive information on compliance that can be obtained with periodic inspections. They also shift some of the economic burden of monitoring to the regulated community. For instance, the industrial sector, the agricultural sector, the public work sector, etc., should self-monitor, self-record-keep, and self-report on the water and environmental aspects associated with their activities to the regulating agency. Self-monitoring requires that reliable and affordable monitoring equipment be available to the regulated community. Self-monitoring, self-record-keeping, and self-reporting has the disadvantage of relying on the assumed integrity and capability of source to provide accurate and punctual data. It also places a burden on the regulated community and increases the paperwork for compliance program. The data will be misleading if the source either deliberately falsifies the information or lacks the technical capability to provide accurate information. Therefore, it is advisable for regulating agency planning to utilize self-monitoring, self-record-keeping, and self-reporting to establish a modality to help ensure accuracy. This can be achieved by restricting self-monitoring requirements only to facilities with appropriate technical capability, by developing QA/QC standards and programs for monitoring, record

keeping and reporting. Penalties should be set including severe deterrence for any deliberate deviation from these standards.

It is important to note that self-monitoring, record-keeping, and self-reporting programs should be designed and imposed by the regulating agency to account for the following aspects:

- Discharge and ambient water quality standards to be observed,
- parameters to monitor,
- sampling locations,
- sampling frequency,
- standard methods for water and wastewater sampling and analysis,
- minimum acceptable analytical quality control,
- methods for records-keeping,
- frequency and timing of reporting,
- reporting format,
- penalties for not monitoring,
- sanctions for missed or delayed reporting, etc.
- penalties for deliberate falsification of information
- internal QA/QC program for insuring reliability of the generated and reported data

In general, self-monitoring and reporting can be good substitutes for the efforts governments are exercising for the implementation of water and environment regulations. They will undoubtedly reduce enforcement costs without compromising deterrence. Of course, self-monitoring and self-reporting do not entirely remove government enforcement costs. Instead, the government enforcement authority will have a new type of monitoring to consider, namely auditing the self-monitoring process and self-reporting content. The objective of the new monitoring (auditing) task is to verify the validity of the reported information and imposing sanctions if the regulated facility was found to be lying or falsifying information. In this case regulated facilities should be formally informed that they must report any violation of discharge standards or pollution prevention requirements. The magnitude of any imposed penalty should subsequently depend on whether the violation is promptly reported voluntarily or if the government enforcement authorities discover it when no self-report has been made. For the latter, the imposed penalty should be considerably higher. In case some governments decide on incorporating self-monitoring and self-reporting requirements in their water and environmental legislation, it is advisable to include severe enforcement powers. For instance, failure to report and/or submitting of false report and data should be treated as criminal offenses punishable by imprisonment. On the other hand, consistent and timely self-reporting of violations should be rewarded with more lenient treatment by prosecutors who might agree not to bring criminal charges or to reduce the severity of the sanctions.

Self-monitoring and reporting requirement identifies potential violations and provides the regulating agency inspectors with a complete history of the compliance behavior of the regulated facility. All facilities permitted to operate can also be required to file regular wastewater discharge monitoring reports on a monthly or quarterly basis for all the constituents designated for monitoring as a precondition for the renewal of the discharge permit. Meanwhile, in addition to self-monitoring, reporting and monthly discharge monitoring report systems, regulating authorities should also have the authority and/or liberty to resort to other measures to insure the compliance of various regulated parties. While required self-monitoring and submission of monthly discharge monitoring reports are key features of the compliance program, regulated sources also should be subject to periodic on-site inspections by regulating agency inspectors or its delegated responsible authorities. Part of the on-site inspection should include a review of monthly discharge monitoring report, record-keeping, compliance status, and reasons for noncompliance. Owners, managers or operators of facilities discovered to submit incomplete, inaccurate, or false information should be subject to strict civil or sometimes criminal sanctions as mentioned earlier.

It is important to note that it is the responsibility of regulating agencies to define to the regulated facilities each type of noncompliance event in which the plant management should necessarily provide notification. Sometimes, it is required that significant environmental events be reported to regulating agency before the events take place.

Examples of significant events, other than noncompliance, that need notification are the removal and disposal of hazardous chemicals, shutdown and purging of major production lines, disposal of toxic substances such as PCBs, etc.

Usually, it makes sense to provide the notification in a two step process- the first being an oral notification followed by a written notification. The procedure should specify the timing of the oral report - i.e., the elapsed time after noncompliance has occurred or after it has been detected, within which the notification must be made to the regulating agency.

Likewise, the timing for the written notification and the form and minimal content of the written notification should be specified by the regulating agency. For instance, the written notification should identify the following:

- The requirement with which there was noncompliance.
- The actual conditions that existed.
- The duration for which the condition of noncompliance persisted.
- The root cause of the noncompliance.
- The corrective action to be taken.
- The impact of noncompliance on the facility and its employees.
- The projected duration of the impact on the facility and its employees.
- The present and potential future impacts of the noncompliance on the public.
- The estimated duration on the impact of noncompliance on the public.

It is a part of regulating agency responsibility to follow-up and assure that the self-reported noncompliance event at hand is either rapidly corrected or otherwise promptly addressed. An administrative procedure should be designed by the regulating agency to require a fast corrective reaction by the facility to the reported. The response should be in the form of a Corrective Action Report (CAR) submitted within a specified time. The CAR should address the noncompliance condition at hand, the measures taken to remediate the condition and the impact of such condition.

### 6.3 AREA MONITORING BY REGULATING AGENCIES:

Area monitoring can be another method for regulating agencies to use for compliance monitoring, although it should be less used than self-monitoring and reporting. It consists of using ambient monitoring or remote sensing to monitor water quality and environmental conditions in the vicinity of a facility or over a large area. Area monitoring can be used to:

- Assess the overall impacts of certain activities,
- Assess trends,
- Define the fate, transformation, transport and distribution of discharged pollutants in the environment,
- Provide data useful in assessing risks and health impacts
- Provide a screening device for identifying potential violations.

This source of information is very useful in detecting possible violations without entering the facility. It also determines whether permits and discharge requirements are providing adequate environmental protection. However, this source of information can also be difficult to establish causality. It is difficult to obtain precise information that can be used as credible evidence in courts of law. Area monitoring includes ambient monitoring, remote sensing and over-flights.

Regulating agencies should recognize that ambient monitoring is most useful when a source is the only significant polluter in the investigated area or when its discharges have a characteristic composition that serves to fingerprint them.

#### 6.4 CITIZEN COMPLAINTS:

The public complaint process is one of the most common mechanisms for public input in water and environmental enforcement. It usually allows any person to file a complaint with the government regarding activities that are causing environmental harm or ecological imbalance. The federal or municipal government is then required to look into the matter and provide a response within a relatively short period of time. In many of the developed countries, citizens are also allowed to go a step further by taking legal action to enforce environmental laws, either under specific provisions in environmental laws, or in accordance with administrative or civil codes. Citizen participation in enforcement of water and environmental legislations through complaints can build a broad-based popular support for what can be controversial enforcement actions. Citizen complaints can be used to unveil and expose non-compliance's that are not detected by inspection or self-monitoring. However, this source of information is often sporadic, non-consistent, and sometimes unreliable.

The mix of compliance information sources varies from one country to another, with inspection by government officials followed by citizen complaints as the most prevailing sources of information. In this connection, self-monitoring and self-reporting should be promoted due to its cost-effectiveness as an information source of monitoring for compliance. It might be worthy to develop -with the assistance of NGOs- programs to encourage citizen involvement by providing a financial reward for any citizen complaint that leads to a conviction of the non-complying facility. Citizen complaints are based on the fact that citizens know the country's land and natural attributes more intimately than regulating agency inspectors ever will. Their large number makes them more pervasive than the largest enforcement government agency; and seeing citizen as part of the enforcement team helps shield the regulating agencies from isolation.

## 7 ENFORCEMENT RESPONSE TO VIOLATIONS

Enforcement officials at regulating agencies should be able to examine every suspected violation of which they have knowledge. If after the examination the inspectors determine that there is insufficient evidence to prove the violation or that the violation did not, in fact, occur, they will take no further enforcement action.

### 7.1 CRITERIA FOR RESPONSES TO VIOLATIONS:

Whenever a violation of the water and environment requirements is discovered, regulating agencies enforcement officials should apply the following factors when deciding on the kind of enforcement action they must take:

1. **Nature of the violation:** This includes:
  - consideration of the seriousness of the harm or potential harm,
  - the intent of the alleged violator,
  - whether this is a repeated occurrence and
  - whether there are attempts to conceal information or otherwise subvert the objectives and requirements of the act.
2. **Effectiveness in achieving the desired result with the violator:** The desired result is compliance with the water and environmental requirements, within the shortest possible time and with no further reoccurrence of violation. Factors to be considered include:
  - the violator's history of compliance with the act,

- willingness to cooperate with enforcement officials, and
- evidence of corrective action already taken.

3. **Consistency in enforcement:** Enforcement officials have to insure consistency in their responses to violations. Accordingly, regulating agencies officials should consider how similar previous situations were handled in the country, in the region and from around the world, when deciding what enforcement action to take.

## 7.2 LEVELS OF ENFORCEMENT ACTIONS AVAILABLE FOR REGULATING AGENCIES TO RESPOND TO WATER AND ENVIRONMENTAL VIOLATIONS:

Inspection or monitoring activities may uncover permit or requirement violations. In such an event, regulating agencies might consider one of the four legal actions pursuant to the appropriate statute as follows:

### 7.2.1 **Administrative Actions:**

Administrative actions may either be informal or formal.

**Informal Administrative Action:** Informal administrative actions are basically notices of noncompliance or warning letters issued from regulating agency. They are usually advisory in nature. In these actions, the manager of a facility is advised that a violation have been found, the corrective action needed, and the time within which an action to correct the problem must be instituted. Generally, informal actions carry neither penalty nor power to compel action. However, the records of an informal action can be used to support more severe legal actions when situation is not satisfactorily corrected.

**Formal Administrative Action:** Formal administrative actions are legal actions that result in an order requiring the violating party to correct the violations and, in most cases, to pay a civil penalty that commensurate with the seriousness and circumstances of the violation. These administrative actions are strong enforcement tools. If a person violates the terms of an administrative order, a court action may be obtained based on an regulating agency recommendation, to force compliance with the order. Generally, administrative actions are the most expedient means of requiring correction, and they are used in lieu of civil or criminal actions whenever appropriate.

#### **How Can Regulating agency Implement Administrative Actions?**

It is strongly recommended that administrative actions can be taken under regulating agency internal administrative litigation system. This system is very comparable to any court system, except that it is presided over by regulating agency administrative law judges, whose salaries in this case should be paid by the regulating agency.

In all cases, these administrative actions have the potential to be challenged in the legal court systems. Therefore, the conduct of the administrative actions by regulating agency should be governed by an extensive set of procedural rules designed to provide mature legal processes to the alleged violator and to ensure the integrity of the system.

Violators should always have the right to appeal the initial rulings of the administrative judge to regulating agency chief administrator, and may appeal the chief administrator's final decision to the proper courts of law.

### 7.2.2 **Civil Judicial Actions:**

Civil actions are taken in the member state's court system by the country's Ministry of Justice (MJ) at the request of the regulating agency. Typically they are used against more serious or recalcitrant violators of water and environmental laws. Generally, they are intended to seek prompt correction of imminent hazard situations posing immediate threat to human health or the environment. Preparation of civil judicial cases is resource intensive because of the Ministry of Justice involvement and the more formalized procedures required for court action as compared to administrative actions. The civil judicial action requires efficient and prompt court systems with judges familiar with water and environmental issues and requirements. The efficiency of court systems varies widely, with some having acceptable

efficacy while others are seriously inefficient. However, the number of judges, who are familiar with water and environmental laws and requirements, is very limited.

Civil cases often result in penalties and court orders requiring correction of the violation and also requiring specific actions, such as specialized monitoring to prevent future noncompliance.

### 7.2.3 Criminal Judicial Actions:

Criminal actions are taken when a person or industry has knowingly and willfully committed a violation of the law. In a criminal case, the magistrate should prosecute the alleged violator in a court system, seeking criminal sanctions, usually including fines and incarceration. Criminal actions should be taken only when flagrant, intentional disregard for water and environmental laws, and/or deliberate falsification, or alteration of possibly incriminating documents or environmental records, occur. The Ministry of Justice usually brings criminal cases at the exclusive request of the regulating agency. Criminal cases are the most difficult to pursue. It is important for the regulating agencies to recognize that they will require sophisticated special investigation and case development procedures and they should involve the highest standard of proof, including proof of intent of the violator to commit the violation. It is also important to note that the ability to apply criminal enforcement in water and environmental cases in will depend on each country's legal system and on whether appropriate authority is provided in its enacted water and environmental or other laws.

Criminal cases, which can include incarceration as one of the penalties, should be the least used of the potential legal actions. However, their mere existence is fundamental for the following two main reasons:

- The environmental requirements either currently in place or under development by regulating agency might call for criminal cases to be filed, giving the requirements a much more deterring power, and
- Based on experience from USA and Western Europe, it is believed that the most effective deterrent is to find "the person who turned the valve, i.e. the person who directly caused the water and/or environmental damage" and perhaps his superiors guilty of criminal conduct, and send them to jail. This will definitely impress corporations operating in much more than the low to moderate corporate fines in civil cases.

## 7.3 SUGGESTED MEASURES FOR RESPONDING TO WATER AND ENVIRONMENTAL VIOLATIONS:

Potential adverse consequences of non-compliance should not be restricted to the conventional responses provided beneath. Response to water and environmental violations can also include permit provocation's, fines, and adversarial relations with regulating agency, as well as criminal prosecution of corporate officials. Conventionally, the response to water and environmental violations includes in an increasing order one of the following regulating measures:

### 7.3.1 Warnings:

Regulating agency inspectors may use warnings in the following cases:

- When they believe that a violation of the act is continuing or has occurred; and
- When the degree of harm or potential harm to the water and environment, human life or health appears to be minimal.

When deciding on whether to use warnings or more severe enforcement action, regulating agency inspectors may also consider the following:

- Whether the individual, company or government establishment has good history of compliance.
- Whether the individual, company or government establishment has made reasonable efforts to remedy or mitigate the consequences of the offence or further offences.

Warning should be given in writing including the following information:

- The section of the act that was violated.

- A description of the alleged offence.
- The time limit within which the person, company or government establishment must comply with the warning.
- The statement that if the warning is not noticed, enforcement officials will take further action.

### 7.3.2 Directions by Inspectors:

Where there is release of a pollutant in contravention of the passed water quality or environmental regulations, a regulating agency inspector may give directions to the regulated community either a person, company or government establishment that owns the released pollutant to take all reasonable emergency measures to:

- Remedy any dangerous situations; or
- To reduce any danger to the water resources, environment or human life or health that results from such a release.

The regulating agency inspector will not ordinarily issue such directions unless the obligations are not met. The directions should be given in writing.

Failure to comply with the directions by the regulating agency inspector should head to prosecution of the regulated community either an individual, company or government establishment for this failure. In case of inability to comply with the directions, the regulating agency inspector should be empowered by the passed water and environmental legislation to take the action himself or to hire qualified experts to take the emergency measures at the regulated facility expense.

### 7.3.3 Ticketing:

The purpose of ticketing is to delineate exact offences, associated fines, and procedures to respond to tickets. The water and environmental regulations should designate offences where there is minimal or no threat to the water quality, environment or human health, as ticketable offences.

The inspector should not issue a ticket unless he determines that a warning is the appropriate response and the offence is a repeated occurrence.

Once the regulating agency inspector issues the ticket, the accused party may within a certain time limit stated on the ticket respond in three different ways:

1. May plea guilty and pays the fine to the appropriate court as indicated on the ticket without making a formal court appearance.
2. May plea guilty with an explanation and appears in court to request lower penalty or additional time to pay the fine.
3. May submit a plea of not guilty, resulting in formal court proceedings.

If the accused fails to choose an option and does not respond within the time limit, a conviction is then entered against him and the regulating agency should begin proceedings to collect the penalty.

### 7.3.4 Injunctions:

The regulating agency directors should be given the authority to seek an injunction “court order”, in order to stop or prevent a violation of environmental and/or water legislation. Regulating agency inspectors are supposed to carry out inspections to ensure that the regulated community either an individual, company or government establishment complies with the terms of the injunction.

If the individual, company or government establishment does not comply with the injunction, the regulating agency director should return to the court to seek:

- A contempt “disregard” of court ruling.

- Instruction by the court for the violator to comply within the stated time limit in the injunction.
- Any additional penalty, such as fine or imprisonment that the court may see fit to impose in its contempt of court ruling.

### 7.3.5 Prosecution:

The regulating agency inspectors should lay a charge for every violation of the promulgated water and environmental regulation unless they determine that:

- A warning is the most appropriate enforcement action
- Issuing a ticket is the most appropriate response

Prosecution should always be pursued in the following cases:

- There is a death of or bodily harm to a person.
- There is a serious harm or risk to the water resource, environment, human life or health.
- The alleged violator knowingly provided false or misleading information, or made a false or misleading test of substance in pretended compliance with the enacted environmental regulations.
- The alleged violator obstructed the inspector in carrying out of his or her duties and responsibilities.
- The alleged violator interfered with a substance seized by an inspector under the enacted regulations.
- The alleged violator concealed or attempted to conceal information after the offence occurred.
- The alleged violator did not take all reasonable measures to comply with a direction by the regulating agency inspector.

### 7.3.6 Penalties and Court Orders upon Conviction:

Upon the conviction of an offender for a certain violation it is expected that the regulating agency inspectors would recommend to the prosecutor the proper penalty to be imposed. The recommended penalty should commensurate with the nature and gravity of the offence. Penalties to be included in the enacted water and/or environmental regulations should include fines or imprisonment or both and court orders that accompany a fine or imprisonment. When making such a recommendation with respect to sentencing, the regulating agency inspector should apply the following criteria:

- The nature of the violation.
- Effectiveness of the recommended penalty in achieving the desired result with the violator (namely compliance with the regulations and no further reoccurrence of the violation).
- Effectiveness of the recommended penalty in deterring others from committing violations and in ensuring compliance with the statute (general deterrence).

Upon conviction of the violator, the regulating agency enforcement officials may request in their recommended sentence, that the court include one or more of the following orders:

- Prohibit the offender from doing any activity that may result in continuation or repetition of the offence.
- Direct the offender to correct resulting harm to the environment or to take measures to avoid potential harm.
- Direct the offender to notify, at the violator's own expenses, any person, company, or government agency adversely affected by the offender's infraction of certain water and/or environmental regulations.
- Direct the offender to publish the facts relating to the conviction
- Direct the offender to compensate the regulating agency for the costs of the preventive or corrective measures (including cleanup) taken by the regulating agency as a result of the violation.

- Direct the offender to pay an amount for the purposes of conducting research into the ecological use and disposal of the substance in respect of which the violation was committed.

## 8 CREDIBLE EVIDENCES FOR THE INDICTMENT OF VIOLATORS OF WATER AND ENVIRONMENTAL LAWS

Following the promulgation of water and environmental regulations, regulating agencies will face the need to enforce the adopted regulations and the set of operational standards. Enforcement of these requirements will evidently necessitate the submission of unchallenged indictment evidences of violations and noncompliance to the court of law if deemed necessary. Most of the evidences of indictment will be based on results generated from monitoring systems either in the form of in-situ automated systems or analytical laboratory systems designed for the analysis of water and environmental samples from different matrices. These analyses will be conducted to either establish or disprove that the quality of the discharges or ambient environmental qualities exceed the limits set by the regulating agency. Credible evidence is the only means by which any alleged fact that is being investigated may be established or disproved. Documentation of evidence must be accurate, authenticated by signature or initials and complete. A universal rule is that hear-say is inadmissible (hear-say evidence that is based not on a witness' personal firsthand knowledge or direct involvement, but on matters told to him by another).

Evidence includes everything individual does that is relevant to an issue at hand. It may include:

- Inspection reports.
- Recorded personal observations during inspection.
- Video recording of the offences.
- Dated photographs with clear landmarks.
- Examination of self-monitoring reports.
- Field notes appropriately dated and signed or initiated.
- Specific conversation with identified individuals.
- The collection of samples at a particular time in a particular day, and similar information.

It is important to note that regulating agency should develop systems that can furnish credible evidence for the purpose of legal enforcement of environmental regulations.

The following are the means and criteria by which regulating agencies can insure the credibility of its evidence against violators and noncompliance perpetrators.

### 8.1 SAMPLING AND ANALYSIS:

Traditionally, prosecutors and judges are very fond of analysis and measurements. These are considered as "hard facts or evidences", while oral descriptions of say the ecological condition of an aquatic environment are not accorded the same significance. In regular situation, an accredited laboratory will carry out the analyses or measurements. The court is usually not forced to unconditionally accept such measurements. The court habitually attaches great importance to analyses being carried out as prescribed in the authorization conditions. Issues that might affect the court decision in accepting the evidences include the following:

- Precision, accuracy, reproducibility, sensitivity and detection limit of the analytical methods.
- Reliability including routine maintenance and operation of sampling gears and measuring instruments.
- Adopted Quality Assurance (QA) and Quality Control (QC) programs including chain of custody.
- Qualifications, training and competence of inspectors, field and laboratory operators.

Sampling and analyses to be used for evidence may involve wastewater discharges, water bodies, aquatic sediments, or sludge's, bacteria, waste effluents or waste sludge, toxic substances containers, water supply systems etc. All sampling and analysis should be subject to a precise quality assurance/quality control programs for field and laboratory activities. Standard analysis and operating procedures such as USEPA, OSHA, NIOSH, ASTM, ISO 14,000 or equivalent should be recorded and strictly followed. Where it is necessary to deviate from the above plans or standard procedures, the deviation should be recorded and the reason for such a deviation noted. The controlling key word is proper documentation. All aspects related to sampling and analyses procedures should be recorded, dated, and signed or initiated by the person who will be in a position to testify regarding personal participation in the action and personal knowledge of the facts presented on the signed note page.

In addition to the long-term ambient water and environmental quality monitoring, the primary focus of regulating agency laboratories should include test results for scientific investigations related to compliance and enforcement. Obviously, regulating agency laboratories should have staff that can provide indisputable Certificates of Analysis (COA) and serve as expert in testimony for prosecution.

## 8.2 IMPLEMENTATION OF A FLAWLESS CHAIN OF CUSTODY:

In order to make water and environmental analysis admissible to court of law and utilized in the legal proceedings, they should be subject to a very tight chain of custody. Proper chain of custody procedures allow the possession and handling of water and environmental samples (evidences) to be traced and identified at any moment, from the time that sample containers are initially prepared for sampling, to the final disposition of the sample. A qualified and officially nominated QA/QC officer should manage the chain of custody in regulating agency laboratories. The chain-of-custody should include the following:

1. A written record of the laboratory's source and manner of preparation of sample containers should be referenced. This should include the laboratory quality control procedures for assuring that a container is clean, ready to accept a sample, properly labeled and of proper size and material. Sample label should be water proofed, marked with indelible ink, and secured to the body of the sample container. They should contain the sample number, preservation technique if applicable, date and time of sample collection, and initials of the collector.
2. A documented procedure for management of sample containers, both in the field and in the laboratory, to prevent either inadvertent contamination or potential opportunities for tampering.
3. The field supervisor should maintain a bound, page marked field logbook in a manner such that field activity can be completely reconstructed without reliance on the memory of the field crew. Items to be noted in the logbook should include the following:
  - Date and time of activity
  - Names of field supervisor and team members
  - Purpose of the sampling exercise
  - Description of the sampling site
  - Location of the sampling site
  - Sampling equipment used and their calibration records
  - Any deviation from standard operating procedures and the justifying reason.
  - Field observations

- Field measurements made
  - Results of any field measurements
  - Sample identification
  - Type and number of samples collected
  - Sample handling, packaging, labeling, and shipping information
4. The field logbook should be kept in a secure place until a unit effort or activity for which particular logbook is maintained has been completed, whereupon the logbook should be kept in a secure case file.
  5. The official QA/QC officer should make sure that chain-of-custody record accompanies each group of samples from the time of collection to their destination at the receiving laboratory. Each person who has custody of the samples at any time must sign the chain-of-custody form and ensure that the samples are not left unattended unless secured properly.
  6. Gummed paper custody seals or custody tape should be used to ensure that the seal must be broken when the container is opened.
  7. Within the laboratory, security and confidentiality of all stored material should be maintained at all times. This may require that any analyst sign for any sample removed from the refrigerated storage area for purposes of performing analysis and note the time and date of returning a sample to storage.
  8. Before releasing or reporting any analytical results, all information on sample labels, data sheets, tracking logs, and chain-of-custody records should be cross checked to ensure that data pertaining to a sample are consistent throughout the record.

### 8.3 DOCUMENTATION:

Records should detail all information about sample and/or test organisms, including the following:

1. Collection: Date; time; locations; pre- post-, or dechlorinated; weather conditions; wind direction; hydrographic circulation patterns; methods of collection; and collector.
2. Transportation: Method, chain-of-custody, packing to ensure correct temperature maintenance and security.
3. Laboratory: Means of storage, methods of analysis, calibrations, quality assurance, quality control, chain-of-custody, and security.
4. Testing: elapsed time from sample collection, pre-treatment, standard method identification number and type of test.
5. Test organisms: species, source, age, health, and feeding.
6. Test results: including quality control results such as field and laboratory blanks, duplicates, replicates, spikes and controls.
7. All calculations that impact test results and interpretation such as instrument calibrations, detection limits, method's sensitivity and standards preparation.
8. Any observations of a non-routine occurrence that may be important in interpretation of results.
9. Equipment and instrument maintenance, malfunction and calibration.
10. Any deviation from the protocol.

### 8.4 EXPERT AND WITNESS TESTIMONY:

Expert testimony is evidence presented by a person where both sides and the court agree that the person is an expert on the subject at issue because of education, qualification, training, or knowledge of the subject matter. An expert may

testify on the alleged facts presented in the case or on personal judgment or conclusions based upon similar situations elsewhere with which the witness is familiar in a professional way.

As with all evidences, a witness must describe why, where, who, and what the results were, because the witness saw these occurrences or was personally involved in the act. As stated earlier, a witness cannot testify on something that the witness has heard someone else say. This is because it is based on the veracity and competence of someone other than the witness himself.

## 9 INCORPORATION & ASSESSMENT OF PENALTIES IN THE WATER AND ENVIRONMENTAL ORDINANCES

Penalties for water and environmental noncompliance should be incorporated with the water and environmental ordinances, including standards and Maximum Permissible Levels (MPL) specified in the various water and environmental requirements either currently in use or under development. Cash penalties should be only one element of regulating agency overall enforcement effort. Regulating agencies should also use other sanctions, in addition to the cash penalties such as:

- Denying or revoking permits.
- Partial or full Shutdown of operations.
- Cutting essential services such as water, electricity or telephone lines.
- Imposing additional compliance conditions.
- Incarceration.
- Publicizing enforcement actions to create deterrence.

It is strongly recommended that regulating agencies should take specific enforcement actions at the very early stages, immediately following the issuance of the water and/or environmental regulations, against violators at specific sites where inspections have revealed violations. These firm and intractable actions will very likely be capable of fostering compliance at all facilities throughout the country. Based on every experience from around the world, enforcement casts a wide shadow of deterrence, which dissuades people from violating the water and environmental laws.

A credible enforcement presence by regulating agency will presumably give the regulated community a substantial incentive to comply. Regulated community managers should indoctrinate that it is good business strategy to comply with water and environmental regulations, it is worthy to acquire immaculate reputation and meritorious to take the credit for good community citizenship. The alternative is noncompliance and the unfavorable publicity associated with violations and penalties for them.

### 9.1 ASSESSMENT OF ENVIRONMENTAL PENALTIES

Enforcement of environmental laws and regulations via penalty assessment will undoubtedly realize the following three major goals:

1. The first goal is the realization of successful deterrence because it provides the best protection for the water resources and environment and it reduces resources necessary for program administration. If penalty is to achieve deterrence, both a potential violator and the general public must be convinced that a penalty places a violator in a worse position than those who have complied in a timely fashion.

2. The second goal of enforcement via appropriate penalty assessment is the fair and equitable treatment of regulated community.
3. The third goal of enforcement by penalty assessment is provision of a swift solution for a lingering water and environmental problem.

Water and environmental protection regulations either enacted or currently under preparation should authorize and enable in their articles, the administrator of the regulating agency to bring civil judicial and administrative actions against those who violate certain enumerated requirements of these water and environmental regulations. In these judicial and administrative actions the administrator of regulating agency may seek civil penalties.

- Regulating agencies should bring enforcement actions to require alleged violators to promptly correct the violations and remedy any harm caused by the violations.

This chapter is basically designed to assist regulating agencies in defining the appropriate penalties for the settlement of civil and administrative actions. It will also provide regulating agency with the guidelines needed to estimate the lowest penalty figure, which the agencies should accept in an out-of-court settlement. The guideline is designed so that violators whose actions, or inactions, result in a significant economic benefit and/or harm or threaten public health or the environment would pay the highest penalties.

The proposed penalty assessment guidelines will be designed to serve the following four important purposes:

1. Penalties should be large enough to deter noncompliance.
2. Penalties should help insure that violators do not obtain an economic advantage over their competitors.
3. Penalties should be consistent and predictable across all geographical locations. This is desirable as it not only prevents the creation of "pollution heavens" but also provides fair and equitable treatment to the regulated community wherever they may operate.
4. Penalties should be based on a logical calculation methodology to promote swift resolution of enforcement actions and the underlying violations.

## 9.2 CRITERIA TO ASSESS SANCTIONS FOR DETERRENCE:

Regulating agencies should develop an internal policy on items to consider in determining the civil penalty that will provide deterrence. In most cases the items for consideration should be designed to ensure that penalties eliminate any significant economic benefit resulting from noncompliance. In many instances, the economic advantage to be derived from noncompliance is the ability to delay making the expenditures necessary to achieve compliance.

Examples of noncompliance may include one or more of the following:

- Discharge of wastewater exceeding the Maximum Allowable Concentration (MAC).
- Failure to install equipment needed to meet discharge standards.
- Failure to affect process changes needed to eliminate pollutants from products or wastewater effluents.
- Failure to self monitor where testing is mandatory to demonstrate achieved compliance.

A penalty should include an amount reflecting the seriousness or gravity of the violation. Factors that regulating agencies should take into consideration in this case include:

- Actual or possible damage caused by the violation.
- Importance to the regulatory scheme.
- Relative impact of a penalty on the violator.
- Amount of pollutant released to the environment.

- Degree of toxicity of the discharged pollutant.
- Sensitivity and vulnerability of the environment.
- The duration of time a violation continued.
- The degree of willfulness or negligence.
- The degree of cooperation or non-cooperation in reporting of noncompliance and prompt correction of environmental problems.
- History of noncompliance.
- Ability of the violator to pay the fine.

### 9.3 METHODOLOGY FOR PENALTY CALCULATION <sup>1</sup>

1. The statutory maximum penalty should be included in the water and/or environmental regulations. For instance, the maximum statutory penalty for the violation of the daily maximum limit for pollutant “A” is US \$ 15,000.00; the maximum statutory penalty for failure to properly monitor for pollutant “B” is US \$ 3,000.00; etc.
2. Before proceeding to calculate the settlement penalty, regulating agency staff should estimate the statutory maximum penalty in order to determine the potential maximum penalty liability of the illegal discharge. The penalty that any regulating agency seeks in settlement may not exceed the specified statutory maximum amount. In general the maximum penalty for violations of an effluent limit for a period longer than one day includes a separate penalty for each day in the time period (assuming there was a discharge on each day).
3. The monetary penalty is calculated based on the following formula.

<b>PENALTY = ECONOMIC BENEFIT + GRAVITY +/- GRAVITY ADJUSTMENT FACTORS – ABILITY TO PAY.</b>
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#### 9.3.1 Economic Benefit:

Every effort should be made to calculate and recover the economic benefit of non-compliance. The main purpose of incorporating economic benefit in calculating the due penalty is to place violators in the same financial position as they would have been if they had complied on time. Regulated communities that violate certain water and/or environmental act are likely to have obtained an economic benefit as a result of delayed or completely avoided pollution control expenditures during the period of noncompliance. Some of the commonly delayed and avoided pollution control expenditures include:

- Monitoring and reporting (including costs of the sampling, proper laboratory analysis and reporting);
- Capital equipment improvements or repairs, including engineering design, purchase, installation, and replacement;
- Operation and maintenance expenses (e.g. labor, power, chemicals) and other annual expenses; and
- One-time acquisitions (such as land purchase).

#### 9.3.2 Gravity Component

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<sup>1</sup> Environmental Protection Agency, USA, (1995), “Interim clean water act settlement penalty policy”

It is important for regulating agency to make every reasonable effort to calculate and recover a gravity component in addition to the economic benefit component. The removal of the economic benefit of noncompliance only places the violator in the same position, as he would have been if compliance had been achieved on time. Both deterrence and fundamental fairness require that the penalty include an additional amount to ensure that violator is economically worse off than if he had obeyed the law.

It is important to note that calculation of gravity should be based upon a logical scheme and criteria that quantify the gravity of violation grounded on either the enacted water and/or environmental regulations.

The gravity component of a penalty is usually calculated for a certain period "T" (day, week or month) in which there was a violation. The total gravity component for the penalty calculation equals the sum of each gravity component in time T. The T gravity formula is as follows:

$$1 \quad T \text{ GRAVITY COMPONENT} = (1 + A + B + C + D) \times \text{US } \$ 100^*$$

\* US \$ 100 is a suggested penalty that can be readjusted by regulating agency

**Factor A: Significance of Violation** (Rate of 0 to 20).

This factor is based on the degree of exceedance of the most significant effluent limit violation in each time duration T. Values ranging from 0 to 20 are selected from within designated ranges; violations of toxic effluent limits are weighted most heavily (for a duration T). The following guideline is proposed for the A factor as follows:

Table 1: Gravity Factor A - Significance of Violation

Percent by which effluent limit was exceeded	Factor A Value Ranges	
	Toxic Pollutants**	Conventional Pollutants*
Maximum %		
1-50	1-3	0-2
51-100	1-4	1-3
101-200	3-7	2-5
201-600	5-15	3-6
601- >	10-20	5-15
Percent Exceedance of Fecal Coliform Limit	Standard Units above or below pH limit	Factor A Value Ranges
0-100	0-0.5	0-5
101-500	0.51-2.0	2-8
501-5000	2.01-3.0	4-10
5000->	3.01-4.0	6-12
	4.01->	8-15

\* Conventional pollutants are pollutants that are not identified as toxic such as BOD, TOC, Total Dissolved Solids etc. in water and CO, CO2, Total Suspended Particulates in case of air.

\*\* Toxic pollutants are mercury, PCBs, Hg, dioxin, etc.

If there were no effluent limit violations in a particular time duration T, but there were other violations, then factor A is assigned a value of zero in that duration's gravity calculation.

Factor A values for fecal coliform and pH, which are calculated using logarithmic scales are determined using the special scales at the bottom of the table.

**Factor B: Health and Environmental Harm** (range 0 to 50)

A value of this factor is selected for each duration T in which one or more violations present an actual or potential harm to human health or to the environment. Values can be selected from the suggested values of B in the following table:

Table 2: Gravity factor **B** - Health and Environmental Harm

Type of Actual or Potential Harm	Factor B Value Ranges
Impact on human health (e.g. damage to water supplies, etc.)	10-50
Impact on water, air or soil environment	
Whole effluent toxicity limits were exceeded	1-10
Fish kill, beach closing, restriction of water body, soil contamination, land deprivation, etc.	4-50
Other impacts on aquatic or soil environment.	2-25

**Factor C:** Number of Effluent Limit Violations (Range from 0 to 5)

This factor is based on the total number of effluent limit violations within time duration **T**. In order to properly quantify the gravity of the violations; all effluent limit violations are considered and evaluated. Violations of different parameters at the same outfall are counted separately. A minimum factor **C** value of one is generally appropriate whenever there are violations of two or more different pollutants. Values for this factor may be selected by comparing the number of effluent limits exceeded with the number of effluent limits in the permit. For instance if all the limits in the permit were violated in the time duration **T**, a value of 5 would be appropriate; if 50% of the limits in the permit were violated, a factor of 2 to 3 would be appropriate.

**Factor D:** Significance of Non-Effluent Limit Violations (From 0 to 70)

This factor is based on the severity and number of non-effluent limitations requirements violated each time duration **T**. The types of non-effluent violations can be 1- violations of monitoring requirements, 2- violations of reporting requirement, 3- pretreatment program implementation, 4- unauthorized discharges, etc. The value of **D** for a given duration **T** is the sum of the highest value for each type of non-effluent limit violation.

As an example for calculating factor D, for certain duration, assume the following:

- The discharger did not sample for 5 of the 10 parameters in its permit,
- The discharger submitted his monitoring report 20 days late
- The discharger discharged a process effluent through an unauthorized outfall without treatment for several days.

From Table 3, the value of factor **D** will be calculated as follows:

- A value of 4 will be selected for failure to conduct half of the parameters from the first type.
- The delay in submitting the report should not be considered, since the other type 1 violation produced a higher value.
- For the unauthorized discharge a value of 6 may be selected for type 4.

Thus the total value for factor D for the specified time duration is **4 + 6 = 10**.

Table 3: Gravity factor **D** - Non-effluent limit violations

The factor value for a given time duration **T** is the sum of the highest value for each type of non-effluent

limit violation	
Type and extent of violations	Factor D value range
<b>Type 1- Effluent monitoring &amp; reporting violations</b>	
Failure to conduct or submit adequate pollutant sampling data or 1 or more pollutant parameters (but not all parameters)	1 to 6
Failure to conduct or submit any required pollutant sampling data in a given time duration T but <u>with</u> reasonable belief that the facility was in compliance with applicable limits	2 to 6
Failure to conduct or submit any required pollutant sampling data in a given time duration T but <u>without</u> reasonable belief that the facility was in compliance with applicable limits	6 to 10
Failure to conduct or submit whole effluent toxicity sampling data	4 to 10
Delay in submitting sampling data	0 to 6
Failure to submit a periodic compliance report or to sample again after finding violations	2 to 8
Any other monitoring or reporting violation	0 to 10
<b>Type 2- Pretreatment program implementation violations</b>	
All key program activities implemented, with some minor violations	0 to 4
Many key program activities not implemented	4 to 8
Few if any program activities implemented	6 to 10
<b>Type 3- Unauthorized discharge: e.g. discharge through an un-permitted outfall, discharge of a pollutant not identified in the permit, etc.</b>	1 to 20
<b>Type 4- Any other type of non-effluent limit violation</b>	1 to 12

### 9.3.3 Gravity Adjustment Factors:

In certain circumstances, the total gravity amount may be adjusted by two additional factors, namely the history of recalcitration (to increase gravity), and quick settlement reduction factor (to reduce gravity). The resulting figure [Benefit + (gravity +/- gravity adjustments)] is the preliminary penalty amount.

#### **History of Recalcitration:**

The recalcitrance adjustment factor is used to augment the penalty based on a violator's bad faith, or unjustified delay in preventing, mitigating, or remedying the violation. This factor is applied by multiplying the total gravity component by a percentage between 0 to 150 percent. A minimum recalcitrance factor of 10 percent is generally appropriate for each instance in which a violator fails to substantially comply, in a timely manner with an administrative compliance order, information request, or a state enforcement order. Thus if a violator violated 3 administrative orders, a minimum recalcitrance factor of 30 percent is generally appropriate.

#### **Quick Settlement Adjustment Factor:**

In order to provide an extra incentive for violators to negotiate quickly and reasonably, and in recognition of a violator's cooperativeness, the regulating agency may reduce the gravity amount by 10 percent if the regulating agency expects the violator to cooperate.

#### 9.3.4 Ability To Pay:

Regulatory agency should not request settlement penalties that are clearly beyond the financial capability of the violator. This means that regulator should not seek a penalty that would seriously jeopardize the violator's ability to continue operations and achieve compliance, unless the violator's behavior has been exceptionally liable, recalcitrant, threatening to human health or the environment, or the violator refuses to comply.

The adjustment for ability to pay may be used to reduce the settlement penalty to the highest amount that the violator can reasonably pay and still comply with the issued acts. The violator has the primary responsibility of establishing the claim of inability to pay.

If the violator demonstrates an inability to pay the entire penalty in one lump sum in 30 days, a payment schedule should be considered. The period allowed for such installment payments should not generally extend beyond three years.

If a payment schedule will not resolve the violator's ability-to-pay issue, as a last resource, regulating agency can reduce the amount it seeks to a more appropriate amount.