

## **CEA White Paper on insurability of Environmental Liability**

January 2007

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## Table of content

<b>1. Executive summary</b>	4
<b>2. Introduction</b>	5
<b>3. Prerequisites of insurability</b>	6
<b>4. ELD and transposition</b>	8
4.1. Scope of the ELD	8
4.1.1. General remarks	8
4.1.2 Remediation	9
4.1.2.1 Scope of remediation	10
4.1.2.2 How to calculate an interim loss?	10
4.1.3 Preventive action	11
4.2. ELD in the scope of existing insurance products	12
4.3. Considerations regarding transboundary impacts	13
<b>5. Case studies</b>	14
5.1 Sandoz/Doñana cases study	14
5.2 Golf course case study	16
<b>6. Consideration regarding insurability of ELD</b>	17
6.1 Legal clarity and certainty	18
6.2 Measuring loss	18
6.3 Risk assessment	18
6.4 Risk Management	19
6.5 Claims management	20
6.6 Compulsory financial security	20
<b>7. Considerations regarding premiums and available financial protection</b>	22
<b>8. Recommendations</b>	24
<b>9. Annexes</b>	25
9.1 Transposition law process, CEA table	25
9.2 Sandoz/Doñana case study	28
9.3 Golf course case	30
9.4 List of the CEA-EEWG	48

## 1. Executive summary

Since the Environmental Liability Directive (ELD) was adopted in Spring 2004 the insurance industry has been actively engaged in the transposition process of the Directive into Member States law. Parallel to that, the CEA has commissioned an Environmental Expert Working Group (EEWG) dealing with the challenges the new regime will pose to the European insurance industry. The purpose of the present White Paper is meant to stimulate and further deepen the discussions with all relevant stakeholders (i.e. operators, insurers/reinsurers, transposition/competent authorities, DG Environment).

Whereas some Member States have adopted in their draft proposals the full scope of the Directive, some Member States have established draft legislation that goes far beyond the scope of the ELD.

For practical reasons and to speed up the process, the EEWG has based the present White Paper on the scope of the ELD. When the final scope the Member States legislation is known it may be possible for the insurance industry to develop insurance products. One of the prerequisites of insurability is legal clarity and certainty. The transposition of the full and unchanged scope of the ELD into Member States' law would enhance the development of insurance products. Whereas environmental liability insurance schemes on site specific and stand alone basis are still a niche market (only a selected number of insurers, limited capacity available and relatively low market premium volume of about €200m) the European insurance industry has gained considerable experience for pollution cover granted in general third party liability insurance (GTPL) for traditional damage resulting from a sudden and accidental pollution incident and where claims are based on civil law (the estimated market premium in Europe for GTPL is about €15bn). The EEWG recommends as a first step that the development of insurance products is based on the scope of the products currently available and extend them - where appropriate - with features of the ELD e.g. claims based on public law, new kinds of damages etc. In this respect, the EEWG will communicate with the CEA Member States associations to share with them the elaborated cornerstones for possible insurance solutions, risk assessment and claims handling aspects.

The White Paper is also designed to support the discussion with the national transposition authorities, through the national insurance associations. Of particular importance will be the sharing of updates on legal and insurance related developments within the Member States and to initiate discussions with competent authorities to develop plans for cooperation that will assist with the development of insurance products (e.g. to develop methods to evaluate and restore environmental damage in the most effective and cost efficient manner).

**Environmental liability  
Insurance market a niche  
market**

**Working on existing  
insurance covers should be  
a starting point**

**Call for a closer  
cooperation with  
Transposition/competent  
authorities**

## 2. Introduction

Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage (ELD) represents a major step forward in protecting the environment and has been framed to represent a balanced compromise between the diverse interests involved. The insurance industry fully supports and welcomes the objectives of the ELD for the elimination of environmental damage through prevention and the restoration of the environment should damage occur.

In welcoming the agreement of the then draft directive, the Director General of the Comité Européen des Assurances (CEA) commented "As of today, there is no established environmental liability market providing products that match the scope of the agreement. The insurance sector can offer products for part of the scheme (clean up of soil and water) but many risks, such as biodiversity damage, are difficult to evaluate. More work needs to be done to make those risks insurable".

The CEA commissioned an Environmental Expert Working Group (EEWG) to do that work. The CEA represents the interests of 33 countries (including all 27 Member States) and more than 5,000 insurance and reinsurance companies and is able, therefore, to call upon a range of specialists to work together and identify the key issues and potential cornerstones for insurance products. However, the EEWG cannot develop products; that is the responsibility of each insurer who can take forward the work of the EEWG and apply it to their own circumstances, customer base and risk appetite. This White Paper is the result of the work undertaken by the EEWG and will form the basis for further discussions with key stakeholders, including transposition bodies, competent authorities, operators, insurers, reinsurers and DG Environment.

In the context of environmental liability insurance products on a site specific and stand alone basis, the insurance industry is in its infancy in Europe. In some states, pools exist and there are some products available for specific types of enterprise but there are few products generally available to everyone. In essence, it is a niche market with only a relatively small number of insurers offering fairly small amounts of financial protection and with an estimated premium income in the region of €200m. Demand for cover does vary but generally is not high. Cover is often requested as part of the purchase of real estate and the party financing the deal is seeking to protect their investment. Compare this with the general liability market where the estimated premium is €31bn and the market for commercial General Third Party Liability (GTPL) is estimated €15bn. Pollution cover granted in GTPL insurance is readily available to every business in almost all Member States. In comparison, the environmental liability insurance market is tiny and limited to developed insurance markets.

A significant challenge is to transform the environmental liability market from being niche to mainstream. A mainstream market will be one whereby all operators, large or small in any industry will have a choice of products available that meet their individual needs and for which they can buy protection for the financial amounts they consider to be appropriate.

**The insurance industry welcomes and supports the ELD**

**More discussions and further research are needed following the adoption of the ELD**

**A challenging market opportunity for the insurance industry**

We remain a long way from this goal but this White Paper signifies a first step on the journey. It considers a range of relevant issues and uses case studies to illustrate some of the key issues. It sets out what needs to happen during transposition if achievement of the goal is to be accelerated and also identifies the remaining challenges and how they can be addressed. It also considers some of the technical considerations that are important but not always understood beyond the insurance industry and also includes some recommendations that are designed to continue the product development process.

### 3. Prerequisites of insurability

#### Insurance techniques need to be better understood

Insurance is a financial transaction that enables an enterprise to manage risk by transferring it to another party – the insurer – in return for a financial consideration, usually known as the premium. The broad principle is that an insurer will accept a large number of homogeneous risks over a large geographical range and that by achieving such a spread of such risks, the premiums received from all customers will exceed the claims from a relatively small number of customers resulting in a profit for the insurer.

Insurance has existed for more than 300 years and has evolved during that time and continues to do so. Over time, policy covers may become wider and new products will be developed in response to the constantly changing legal, social and economic climate. Premiums will also change as the cost of claims changes and in response to other issues such as competition.

#### Not all risks are insurable

One constant factor, however, is the fact that not all risks are insurable. Examples of what one would normally consider to be uninsurable are:

- Protecting criminals against their criminal activity
- Protecting individuals or enterprises against deliberate acts to cause harm, insurance only covers fortuitous losses
- Research and development risks, which are generally considered to be entrepreneurial risks that an enterprise should retain for its own balance sheet to encourage safe and best practice
- Certain types of mass risks, for example the consequences of terrorism or nuclear operations where special arrangements need to apply
- Unknown risks where the insurer cannot identify the possible scale or number of claims. Insurers owe a duty to their customers to manage their business prudently and provide the level of security and protection they pay for. In addition, insurance regulators will expect insurers to follow corporate governance procedures designed to ensure solvency and security

All insurance policies generally include a number of exclusions and will usually be subject to a financial limit on the liability of the insurer.

Insurance is future-oriented. When the insurer estimates the risk of loss, he will only take into account uncertain, future occurrences of an insured peril. The insurance

should apply only to the consequences of future activities and this is why known existing losses are usually uninsurable.

Only events which are uncertain and whose risks are quantifiable can be taken into account. Data on the incidence of events, their frequency and severity of the losses are all essential to calculate an adequate premium to insure against these events.

The greatest problem for liability insurers is the foreseeability of the loss. The insurer can only set appropriate premiums and the technical reserves required by regulators for uncertain occurrences if they are foreseeable.

Non-foreseeable claims – relating to legal changes with retroactive effects, or technological developments - provide a major challenge to insurers. Insurers may have to pay claims under a larger number of policies and considerably higher claim amounts on policies issued in the past than the amounts anticipated when the policy was written. It will not have been possible for the insurer to predict these claims and therefore calculate or collect any premium, nor been able to put aside any reserves.

What is the border between insurability and non-insurability? There is no clear answer to this question; it is down to individual insurers to decide whether or not to offer to provide the cover. The ability to assess the risk and calculate an appropriate premium is a prerequisite. But even if the risk can be assessed and quantified sufficiently, there are other considerations for the individual insurer who has to decide whether or not to provide cover.

**Insurability also relies on the willingness of individual insurers to provide cover**

The main additional considerations are:

- The legal and economic environment
- The size of his existing portfolio in relation to the risk involved
- The availability of reinsurance protection in case of accumulated losses and/or large severity losses
- The size of his free reserves (excess capital)
- His willingness as an entrepreneur to accept the risk in relation to his expected general results
- The general premium level in the market of the risks involved
- The moral hazard (behaviour) presented by the applicant

Ultimately, it is the choice of each individual insurer who has to decide whether to provide cover or not, after having assessed the risk and after having considered the aspects mentioned before. Thus, insurability can be defined as: the willingness of (individual) insurers to provide cover.

Taking this definition into account, some general misunderstandings regarding insurability can be clarified:

- Insurance capacity is not unlimited, but finite
- Insurability is not the result of the application of a theory of formula on a specific risk, resulting in a clear yes-or-no answer

- The quality of the risk itself does not constitute the answer, because these qualities are only partially relevant
- Insurability is the result of a complex decision-making process by an individual insurer, involving several individual considerations
- Insurability is the result of the ability of an individual insurer to assess the potential exposure properly and to predict the future loss development
- This process results in the willingness of many, few or no insurers to provide cover
- The more insurers that are willing to provide cover, the more insurable the risk can be considered to be, or the more insurers who are willing to provide cover, the greater the insurability

## 4. ELD and transposition

### 4.1. Scope of the ELD

#### 4.1.1. General remarks

Since the ELD was adopted in Spring 2004, the insurance industry has been actively engaged in the transposition process of the ELD into Member States law. Whereas some Member States adopted in their draft proposals the full scope of the ELD, which we welcome, other Member States have established draft legislation that goes far beyond the scope of the ELD (e.g. Poland, Spain).

This situation poses not only significant challenges to the insurance industry but also to industry within the EU territory through exposure to different regimes which may have significant consequences on final costs for operators and their financial risk takers respectively. Member States that have gone beyond the ELD will most likely make insurability of the whole ELD more difficult, not just the additional liabilities. We can anticipate that availability and appropriateness of insurance products will be directly linked to the scope and clarity of provisions made by the different Member States as part of their transposition laws. When the final scope of the Member States legislation is known, it may be possible for insurers to develop appropriate products.

The EEWG was formed in the Autumn of 2004 and has focused on the following aspects:

- Clarify and focus criteria for insurability
- Develop risk assessment criteria and based on that
- Identify possible mechanisms on how to calculate parameters of insurance cost and develop cornerstones for possible insurance solutions

The EEWG will not develop products that will be down to the individual insurers and reinsurers within Europe, the EEWG will produce a report that insurers and reinsurers may wish to use to develop their own product range and ideas for calculating insurance costs. For practical reasons and to speed up process the work of the EEWG is based upon the ELD itself. We have not tried to take into account the fact that some Member States may go further in terms of liability.

**The financial consequences of diverging regimes need to be considered**

The CEA welcomes the efforts taken by the DG Environment to stimulate the discussion within the Member States. The points being discussed, in particular concerning Annex II, are key issues. The number of domains left to the choice and discretion of the individual Member State may have significant consequences on the final costs for operators and financial risk takers respectively, as far as the final aggregated liability is concerned. This relates in particular to the assessment of the interim loss. We fully share the view that it is of utmost importance to fix the many remaining degrees of freedom in order to increase the operators and financial risk takers ability to assess ex ante the amount and nature of their liability, as well as their own room for manoeuvre within the ELD framework. To create more certainty e.g. reduce number of possible choices, is likely to have positive impact on the risk assessment and insurability. In particular, insurers will expect to have a degree of control and influence in the decision-making process on remediation measures, if they are expected to pay the costs.

**A degree of control over the total remediation costs is required**

Below are some of the most important issues the EEWG is considering:

#### **4.1.2 Remediation**

How will the competent authority select options to be considered among the technically feasible ones (Section 1.3.1 of Annex II)?

Apparently no ex ante guidance is given about the priorities and weight given by the authorities to the criteria listed in Annex II. A lack of prioritisation leads to legal uncertainty and most likely different approaches among the Member States. Therefore we urge that such a prioritisation is accomplished at a Member State level. Such a provision would soothe insurers' and operators' concerns about extremely expensive interpretations. We have to establish a process for a close cooperation with the competent authorities to develop methods to evaluate and restore environmental damage in the most effective and cost efficient manner. For comprehensive and affordable products to be developed, the following are key requirements for everyone, including potential policyholders:

**Prioritisation of the various remediation options and close cooperation with competent authorities are needed**

- Calculation of realistic and reliable estimates of amounts likely to be paid out in claims
- Any loss to be compensated must be quantifiable in monetary terms
- Reliable estimation of the probability of any loss and prediction of the severity of losses

Again, it is of high importance for insurers to work closely with the competent authorities in deciding which option to use. If insurability is to be achieved, insurers and reinsurers must have a degree of control over the claim, the remediation and the cost. We must stress the importance for the insurance industry (and other providers of financial security) to contribute to these considerations, as well as being closely involved with the decision making on remediation.

#### 4.1.2.1 Scope of remediation

Annex II of the ELD sets out the scope of the remedial measures for all three types of damage, damage to land, damage to water, damage to protected species and natural habitats.

According to the requirements of the ELD, damage to land is to be restored only insofar as “the contaminated land, taking account of its current use or approved future use at the time of the damage, no longer poses any significant risk of adversely affecting human health”.

As land in most Member States belongs to private individuals and enterprises or is in public ownership, under the existing (civil law) principles of liability, these parties can regularly demand reimbursement of the cost of eliminating contamination from their own land in the event of damage by third parties.

**Insurance products are already available for third party damage to land**

In most Member States, extensive cover in respect of third-party damage to land is already offered as part of public liability insurance or stand-alone environmental liability covers. However available standard liability insurance products limit the scope of cover to sudden and accidental pollution events. The insurance industry therefore has some experience with this type of loss, i.e. on the one hand statistical data and, on the other, claims settlement practice. The same goes for measures following a “sudden and accidental” incident in order to avert imminent insured losses (advance loss minimisation costs or loss prevention costs).

**Claims management practices will need to be adapted**

Where we are comfortable with the insurance aspects, this is because we are involved from a very early stage in any claim. Of course, many claims are brought under existing civil liability regimes which mean that we act on behalf of our policyholder, taking control of the claim and defence on their behalf. The usual rules of civil liability make this possible whereas the rules of public law do not and therefore, while we have experience of the claims, we have less experience (and none in some countries) of the process. This is something we do need to develop: it should not present an impossible burden but is dependent upon our being involved with influence from the outset

The EU regulates the scope of remediation for damage to water and that for damage to protected species and natural habitats in a more subtly differentiated way:

- We consider primary remediation i.e. “any remedial measure which turns the damaged natural resources and/or impaired services back to, or towards, baseline condition” as a result of a sudden and accidental pollution event to be in principle insurable, because it is aimed at restoring the condition that existed before the damage occurred and we do have some experience in assessing this type of risk and in claims handling.
- For the same reasons as with primary remediation, we also consider complementary remediation i.e. “any remedial measure taken in relation to natural resources and/or services to compensate for the fact that primary remediation does not result in fully restoring the damaged natural resources and/or services” (e.g. extended area, habitat elsewhere, use of a different species) to be insurable, even if it is necessary to carry out some or all of the remedial measures elsewhere in order to fully restore the environment.

In both scenarios, however, there are still open questions and legal uncertainties which in each individual loss can lead to discussions with the competent authorities: ascertainment of the extent of the loss, which is also dependent on documentation of the baseline condition (condition before the loss occurred), the assessment of the loss and the existence of a relevance threshold, duration of remediation, the likely success of remediation, what will happen if executed actions do not fulfil envisaged expectations etc.

- Compensatory remediation i.e. “any action taken to compensate for interim losses of natural resources and/or services that occur from the date of damage occurring until primary (and/or complementary) remediation has achieved its full effect”, e.g. resettlement of a large number of the species affected, or extension of the natural habitat, in order to compensate for the interim loss of the environmental service of the protected species or the natural habitat. We consider this remedial measure to be essentially uninsurable at the present time. Measures of this kind ordered by the authorities are not aimed at restoring the baseline condition, but arise in addition to primary and / or complementary remediation. In contrast to primary / complementary measures, where the insurance industry or public authorities have (at least to a certain extent) reliable historical loss information, the field of compensatory remediation constitutes a new compensation category lacking loss experience and reliable statistical data of all involved parties (e.g. insurance industry, operators and public authorities). This presents the biggest challenge to the insurance industry and as previously indicated we are keen to overcome these hurdles through working closely with key stakeholders including the DG Environment and competent authorities.

**Compensatory remediation measures are uninsurable and represent the biggest challenge for the insurance industry**

#### 4.1.2.2 *How to calculate an interim loss?*

There are various formulae known in the insurance industry to calculate the loss of profit (e.g. business interruption). The current concepts used in the US for the calculation of interim losses are based on the assumption that key indicators for each and every natural habitat exist on which the loss of the environmental service can be measured (e.g. the salmon population in a watercourse). The formulae used still require the understanding of the baseline conditions, the extent of the damage and the likely period of time to restore. Such information may not always be readily available and if required, invariably requires considerable effort to calculate. However these calculation methods used do not give an answer to the question of what will happen if the assumptions for the mathematical model turn out to be wrong? To illustrate: the whole remedial option chosen lasts longer than envisaged or the whole selected execution proves to be false to reach the remediation goal.

#### 4.1.3 Preventive action

The ELD requires the operator to prevent or minimise environmental damage where there is an imminent threat of such damage. Under some environmental liability covers today, it is possible to buy insurance for loss preventive measures that avert otherwise insured losses relating to land damage and in some cases, to water damage following a sudden and accidental incident. This means that possible overlaps and

problems of demarcation between existing covers and new concepts based on the ELD must be identified and avoided.

## 4.2. ELD in the scope of existing insurance products

Based on the fact that the “all risk environmental insurance” does not exist, the EEWG has performed a study, the aim of which is to match the different aspects of the liability system in the ELD with the features of insurances available in Europe.

The table below shows comments on aspects that are likely to cause gaps with the scope of the ELD.

Scope of coverage	Comments
Impact on the environment <ul style="list-style-type: none"> <li>- pollution events</li> <li>- other impacts on the environment</li> </ul>	The ELD refers to all types of impacts on the environment whereas environmental liability insurance, as well as GTPL insurance usually limits the cover to pollution events. Some specific products are available in Germany, France and Denmark that extend coverage to other kind of impacts
ELD-definition of environmental damage: <ul style="list-style-type: none"> <li>- damage to land</li> <li>- damage to water</li> <li>- damage to protected species and natural habitats</li> </ul>	Damage to land and/or water are usually covered to some extent. For damage to protected species and natural habitats very limited insurance from a very small number of insurers is available in U.K., France and Spain only
Causes of environmental damage/impact on the environment as a result of: <ul style="list-style-type: none"> <li>- a sudden &amp; accidental/fortuitous event</li> <li>- normal undisrupted or permitted operations</li> </ul>	Insurance usually excludes emissions based on the normal undisrupted or permitted operations. This limitation has not been explicitly found in some products in U.K. and Sweden. The ELD does not differentiate between these two categories.
Environmental damage as a result of defective products and works (products liability and completed operations)	Usually covered under product liability policies and generally limited to traditional damage (i.e. bodily injury and damage to property). Environmental liability insurance does not cover products liability. The ELD foresees that Member States shall take the appropriate measures to enable the operator to recover the costs incurred caused by third parties (including from the manufacturer of defective products).

Intentional acts/lack of maintenance, gross negligence	Insurance does not cover damage as a result of intentional acts and the insurer usually has the right to reduce the compensation for damage arising from gross negligence. The ELD is explicitly applicable for these types of actions (fault based liability for non-dangerous activities) and is based on strict/no-fault based liability for dangerous activities where these types of actions are not relevant
Exemptions - development risk - state of the art - damages caused by authorised emissions	Generally explicitly excluded in civil liability and therefore, excluded from insurance cover whereas the ELD left the decision to the Member States whether or not the operator is liable in these cases

It should be noted that:

- Feedback was received from a representative sample of the European markets
- Insurance products reviewed for this study are the most specific ones found in the market and generally offered by specialist insurers
- The original data was collected in October 2005 and has since been updated

### 4.3. Considerations regarding transboundary impacts

The transposition of the ELD in the Member States might lead to different liability regimes. This situation will challenge all involved parties especially in incidents with transboundary effects (e.g. pollution of a transboundary watercourse leading to environmental damage in various countries/counties downstream). Businesses, the insurance industry and competent authorities are faced with questions such as:

- Which liability regime will apply?
- What are the relevant standards?
- How do involved competent authorities liaise with each other?
- Will there be a pre-defined process?
- Is there a decisive competent authority?
- Who decides on the applicable restoration measures?

which should be addressed and answered beforehand.

To draft insurance products for multinational companies (e.g. companies with plants in several Member States) it is paramount to have transparency regarding the applicable legislation and to have an identified process regarding the definition of the most effective and cost efficient restoration measures. Furthermore, to encourage insurers to offer insurance on a cross border basis, as encouraged by the

EU Freedom of Services Directives, transposition should follow the ELD as closely as possible in each Member State.

## 5. Case studies

### 5.1 Sandoz/Doñana cases study

Ecological consequences of damage to the natural environment are often the result of industrial accidents. There is a long list of instances where the environment has been heavily polluted or has been otherwise significantly damaged. In some of these cases we know that the consequences have resulted in liabilities consequent financial implications for the polluting party and/or the public.

The aim for this study is threefold:

1. Analyse what actions were taken in some very relevant cases that occurred in the past in Europe; who was found responsible applying the existing laws; what were the financial consequences thereof and who actually bore them?
2. Analyse which of these measures would have been required by the competent authority, if the ELD would have been in force respectively which measure would have been required by other civil and/or public laws.
3. Identify additional measures that were not required under the existing legislation but would be once the ELD is transposed into Member States laws.

Unfortunately, the available information in respect to costs resulting from environmental losses in the past is incomplete and the amounts allocated to compensate and/or restore the different types of damages cannot be separated.

With reference to the heavy pollution of the river Rhine caused by a fire in 1986 (Sandoz AG Schweizerhalle Switzerland) and the collapse of a waste retention dam of a mining complex (Boliden Apirsa SL, Aznalcóllar Spain) in 1998, which has led to a flow of toxic sludge and waters towards the Doñana National Park we analysed the possible financial consequences of the introduction of the ELD.

The fire in the warehouse storing agriculture chemicals led to a heavy pollution of the river Rhine – from Switzerland down to the Netherlands. The fire extinguishing water discharged several tons of chemicals into the Rhine over a period of more than 24 hours and seriously damaged the aquatic flora and fauna and killed several tons of fish. Due to the emergency measures and the fact that a large river with constant flow of fresh water had been contaminated the baseline conditions were reached after 2 years - even exceeded. The water quality of the Rhine today is actually better than before the accident. The overall damages have amounted to €90m, whereas the major part of the costs (€39m) were related to the restoration of damage to land in the scope of the ELD (polluter's site). The compensation to fishing

associations/federations and public authorities for gathering dead fish, restocking of fish populations and ecological monitoring – primary restoration regarding the ELD – and the compensation of third party claims (e.g. alternative drinking water supply) amount to approximately €27m. The remaining €24m have been costs for cleaning-up debris and damage to property/goods, which are not in the scope of the ELD. Neither complementary nor compensatory remediation measures have been initiated. Most of these costs were borne by the insurers.

Depending on the pollutants, the aquatic situation and the initiated remediation measures the natural recovery could last from few months up to decades.

As a consequence of this event, the legislation regarding major accident protection became more stringent (e.g. emergency management, specific construction related regulations). The discussion among the property insurers and the liability insurers raised the question of who has to pay for the restoration of damage to land. In this particular case, the property insurers provided cover for the clean-up of the policyholders own property contaminated as a result of a fire event, whereas the liability insurers covered the costs for measures to avoid any further insured bodily injuries or property damages (loss prevention costs). Most of the costs therefore were covered under both policies. From an insurers perspective, it is important to bear in mind that in some cases an environmental accident could trigger several insurance policies (e.g. fire insurance, liability insurance, Worker's Compensation/Employers' Liability insurance). This accumulation potential should be taken into consideration when designing insurance solutions respectively providing insurance protection.

**Remediation costs can be covered by competing insurance policies**

It is also a fact that especially water and air pollution will not stop at the border of the country of origin (damage was reported in Switzerland, France, Germany and the Netherlands). Claims handling is more challenging in cases where several countries/counties with different environmental and civil liability laws are involved. Even if the ELD will form the basis for a new environmental liability regime within the EU, it is possible that based on the transposition within the Member States different laws might be enacted and public authorities might apply different standards. Therefore a close cooperation of competent authorities in cross border environmental damages is paramount to identify and decide on the most effective and cost efficient restoration measure(s).

**Transboundary issues require further discussion to achieve agreement**

In the mining tailing dam case, the breach of the dam resulted in a sludge flood which contaminated a large surface area partially used by farmers, killed all aquatic life which came into contact with the sludge in two nearby rivers and threatened the Doñana National Park - a Natura 2000 site. Due to the swift intervention of the State authorities a large pollution of the National Park was prevented. However a significant area of wetland known as 'The Entremuros' – protected as Special Protection Area (SPA) under the Wild Bird Directive - was affected by the spill. The loss minimisation measures and the primary restoration amounted to €101m. The creation of the "green corridor" (cf. annex 9.2 column 4) - complementary restoration regarding the ELD - amounted to nearly €70m. There were assessment and adjustment costs (cf. annex 9.2, Boliden column 6) which could be allocated to environmental damage and third party damage and finally, an amount of over €10m for the compensation of third party civil liability claims which are outside the scope

of the ELD. The repair of the dam, the clean-up of the contaminated industrial site and a smaller part of the restoration costs have been paid by the polluter. Most of the costs for restoration measures were borne by the public authorities who are now trying to recover these costs from the operator.

Both cases studied show that an industrial accident could lead to severe ecological damage and depending on the endangered areas, to expensive restoration costs. Most costs for the restoration/clean-up of an industrial site (i.e. land damage according to the ELD) are often covered by insurance, and could be in the future if proper insurance products are designed and offered.

#### Conclusions:

- Detailed financial cost information for environmental accidents from the past is rarely available and the ones that are known about do not specifically distinguish between the costs for environmental damage according to the ELD and those linked to other liability regimes. This makes it difficult to use historical information to establish reliable statistical data that could be used to predict the cost of future losses.
- It is a fact, once the ELD is in force, additional new actions or techniques with which we are not familiar might be required (e.g. compensatory restoration/interim loss). This will result in additional costs which the polluter has to bear.
- To support predictability and hence, insurability, it is recommended to elaborate scenario based case studies and try to build up hypothetical estimations of costs linked to the ELD (see below "Golf course Case"). The adequate classification of costs is very important in order to build future statistical data.

## 5.2 Golf Course case study

The aim of the paper was, using a real-life case study, to review the potential impact on the polluter in terms of remediation costs and associated expenses, and to consider these losses from an insurance perspective.

The case study concerned a leak of diesel oil from an IPPC licensed industrial facility that contaminated groundwater, a neighbouring river / lake system and a protected estuary. Post-Spill management costs included;

- Mitigation measures to contain the extent of pollution
- Investigation of the extent of the environmental damage and determination of remedial design
- Remediation
- Communication with the public / media / regulators
- Possible handling of third party claims via insurers

Elements of the above are straightforward to quantify based on current best practice / available technologies but those associated with interim losses are more subjective and loss experience does not exist on which to base remedial estimates.

Several key issues were identified as potential barriers to quantifying the extent of environmental damage and interim loss:

- Exchange rates between species when estimating complementary remediation
- Loss estimation not taking account of the condition of the resource and reflecting natural deterioration of the resource
- The unwillingness of a competent authority to negotiate with Insurers as to the extent of interim loss, where insurers are expected to pay

Principal findings are:

- Little or no loss experience exists for interim losses
- Should the process to determine the extent of the loss become very protracted a greater demand for more cover from the insurance market will be created as the size of the loss will increase
- The potentially long-term nature of such losses will encourage insurers to settle quickly by paying over a sum of money to the competent authority to manage the remediation. This will represent a full and final discharge by the insurer who will have then no further liability under the policy. Dealing with claims over a long period is unattractive to insurers and creates problems surrounding the levels of capital required to support the business (see 7. below)
- Polluters should be given the ability to act on “voluntary” basis to prevent worsening of environmental damage
- Concerns over quantifying interim losses should not detract from the importance of initial management / containment of the loss
- If the estimation of interim loss is seen to be workable and reasonable in practice, it follows that liability for interim loss in particular is more likely to be insurable

## 6. Consideration regarding insurability of ELD

The insurance industry recognises that for the new liability regime to be successful, funds need to be readily available to ensure that any environmental damage is remediated to the appropriate level. This means that one solution is for the development of insurance products and it is to be expected that organisations with new liabilities will seek to transfer the financial consequences to insurers as they have done for many years for other liabilities. Policy makers have also expressed a desire for the insurance industry to respond to the challenge.

For insurance to be available and sustainable, there are several key principles that need to exist. Insurers have to act in a way that satisfies both regulators and policyholders. Insurers are commercial organisations that transact insurance to achieve a profit. There is a responsibility to deliver security to customers in addition to the products they require. In addition, it is of no help to anyone for products to be introduced and

**Managing the expectations from customers and policy makers**

**Development of sustainable insurance products should be preferred**

withdrawn later because of poor underwriting results. To this end, there are certain prerequisites for sustainable insurance products to be developed.

## 6.1 Legal clarity and certainty

A clear and unambiguous legal framework is essential whereby insurers know exactly in what circumstances they are required to pay claims and for what amounts.

## 6.2 Measuring loss

### Insurers must be able to calculate premiums

It is very important for the insurer to be able to calculate the appropriate level of premiums. Insurance operates on a broad principle that the premiums of all of the policyholders should be sufficient to pay the claims of the unfortunate policyholders that suffer a loss, and leaves a small amount for the insurer as profit after payment of expenses. Therefore:

- The insurer must be able to make a realistic and reliable estimate of the amounts likely to be paid out in claims over a specific and reasonably long period of time
- Any loss to be compensated must be quantifiable in terms of money in accordance with established and known criteria
- The insurer must be able to estimate the probability of any loss
- The insurer must be able to predict, in monetary terms, the severity of losses.

## 6.3 Risk assessment

It is very important for any policy to be issued that the underwriter is able to assess the risk presented. He will want to know whether the risk presented to him is good, bad or somewhere between the two descriptions. Underwriters recognise that no two risks are the same. Each risk will present its own individual features and the underwriter will need to be able to assess each one carefully to help him to decide whether or not to accept the risk, on what terms and how much insurance he is willing to offer.

### Insurers must be able to differentiate between good and bad risks

Some of the things the underwriter will want to consider include

- The inherent risks associated with the activities carried on at the site
- The risks associated with the plant and equipment
- The storage of chemicals and other potentially hazardous substances
- The surrounding area to see what is at risk should there be a loss, especially in relation to habitats and sites of special or scientific interest
- Identification of pathways and receptors
- Loss history

- The history of the location as there may be risks associated with the cocktail effect of current use mixed with historical use
- The extent to which contamination may exist already

## 6.4 Risk Management

The level of risk management is a significant factor in influencing underwriters on whether or not cover can be offered and if so, on what terms.

Companies that show a poor commitment to protecting the environment are likely to find it difficult to obtain insurance and even if they can, the terms will probably include high premiums and a substantial element of self insurance. On the other hand, high quality risk management is likely to be rewarded through competitive premiums and coverage.

Insurers cannot visit every site to assess the risks and therefore underwriters will need to ask probing questions to obtain the information they need. Of particular importance will be the:

- Quality of the management of the risk and competence and authority of the person in charge. The higher the risk management function is in the organisation, the greater influence it will have to generate actions and obtain adequate funds
- Compliance with statutory requirements and regulations
- History of risk assessments, understanding of the environmental risks associated with the activities and plans for actions to minimise risks identified
- Implementation of a formal Environment Management System (as described in EMAS or ISO 14000) and commitment at all levels to implementing risk improvement measures
- Regular audits to monitor performance on a continuous basis and subsequent corrective actions
- Financial strength of the organisation. Companies need to be financially sound to implement a proper risk management policy. Companies that are struggling financially are unlikely to invest in new equipment or to maintain it properly. Experience has shown that in difficult times, risk management can be one of the first things to be dispensed with as it may be seen as not adding to the profit of the organisation. The most attractive risks for insurers will be those that are successful and will continue to invest in safe and modern facilities and equipment
- Employee training: all employees should be given proper training in awareness of all aspects of environmental protection; best practice needs to be shared and implemented throughout the organisation. It is also important for refresher training to be given so that employees can keep their knowledge up to date
- Written procedures, widely communicated in the organisation including general policy, standards, templates etc.
- Emergency plan that sets out in detail what to do in the event of an emergency, who has responsibility for each action and stage
- Adequate testing and maintenance of plant equipment to ensure it is in good working order.

**The level of risk management is critical for insurers**

**New claims management skills are likely to be required**

## 6.5 Claims management

Insurance is a promise to pay claims should the policyholder be unfortunate and suffer a loss. It is at this point in time when the policyholder really needs a highly professional, competent and efficient claims service.

Insurers have a wealth of experience in handling claims, including highly complex and technical ones. In the context of liability claims, this is mainly in the area of what might be called “traditional damage”, meaning bodily injury, damage to property and pure economic loss. The ELD does, however, introduce remedial measures for which the industry has very little experience and therefore new claims management skills will be needed. Some of the things we will need to consider include:

- Development of best practices for the handling of claims to the benefit of the environment but without excessive costs
- What techniques exist to restore environmental damage in the most effective and cost efficient manner – How much does it cost – How many companies have the expertise – Is it generally available - How do we obtain it?
- To what extent will insurers be able to exercise control of claims? If Insurers are expected to pay for claims, they will expect to be able to exercise a degree of control of the claim: there is a duty to both regulators and the wider community of policyholders to manage their business prudently and professionally. National laws should recognise this upon transposition
- Effective working relationships with competent authorities will need to be developed to enable insurers to manage their business properly while allowing competent authorities to comply with their responsibilities
- How to deal with claims where the value of the loss exceeds the amount of cover provided by the insurer
- How quickly will insurers be able to close off claims – Will they be able to pay their money over (to the competent authority) and leave others to manage the restoration/remediation without any further involvement from the insurer – What needs to be done to ensure this can be done (See principal findings in 5.2)
- Managing the media and dealing with the public relations issues on behalf of the policyholder

Insurers may well have to recruit specialists in this area.

## 6.6 Compulsory financial security

During the passage through the European Parliament, there was much debate over whether or not the ELD should include a requirement for financial security. While well intended, the effects could have been very damaging for many businesses as the insurance industry does not offer insurance products against all of the liabilities under the ELD.

It is a myth that insurers will insure anything. There are risks that because of their claims record, inherent risks within a trade, methods of working or for other reasons

such as moral hazard may be unable to obtain insurance. It is for policymakers to decide whether or not such businesses should be driven out of business.

Insurers must be free to decide which risks they are willing to accept and those they are not.

There also seems to be a general view that if insurance is made compulsory, it will work. This is not correct either.

For compulsory insurance to work well, a number of things need to be present:

- An established insurance market with stability based upon many years experience
- Sufficient capital due to a realistic expectation of a consistent delivery of profit targets
- A group of risks that are homogenous and where claims cost and frequency is predictable with a degree of reliability
- An abundance of financial insurance capacity to ensure there is competition and freedom of choice
- Substantial amounts of reinsurance to support direct insurers
- Products that provide what the customer wants at an affordable price

Without all of these, any attempt to introduce compulsory insurance will not work. It may work for a while but it will break down eventually as results or a capital shortage force insurers to withdraw from markets, premiums become unaffordable or cover is simply not available to some. There are examples from recent history that demonstrate the problems, most notably with medical liability in several countries. There can be very damaging consequences for many, especially small businesses.

**Compulsory insurance schemes cannot work in this area**

Contrary to GTPL insurance (i.e. insurance cover provided for traditional damage as a consequence of a sudden&accidental pollution incident) stand-alone, site-specific environmental liability insurance schemes are still in their infancy in Europe, the latter is still a niche market with specialist underwriters offering products selectively with highly detailed risk assessment criteria that would not be viable on a much larger scale. Today, none of the essential factors described above exist in addition to which insurance products offering cover for the full scope of the liabilities under the ELD are not generally available.

In addition, compulsory insurance would result in higher costs for customers because they must buy insurance cover – if it will be provided at all - at levels required by law whether they need it or not. This affects small and medium-sized companies the most. They must spend money on expensive, comprehensive liability insurance and as a result cannot spend it on active risk prevention. Ultimately, it is the consumers who will pay for this excessive expense in the form of higher prices for products.

Making financial security compulsory any time in the foreseeable future will not work. However, the insurance industry recognises that it needs to respond to the ELD so that it will be able, in time, to deliver creative and innovative products to those that need them. History has shown that this creativity and innovation is best

delivered within the context of a free market where ideas and thinking are not constrained by a legislative requirement.

## 7. Considerations regarding premiums and available financial protection

Capital requirements in this area are high

Insurance companies transact insurance for the purpose of making a profit and the levels of premiums charged, and the amount of cover to be offered, will take this factor into account.

Insurance products are supported by capital provided by shareholders who expect the insurance company to utilise it prudently in order to return to the shareholders a reasonable return on their investment. In turn, Insurance regulators will ensure that insurers meet required standards of corporate governance and behaviour to meet the solvency requirements of the EU.

The greater the unpredictability or volatility of the line of business, the higher the level of capital that is required. Equally, where there is a high degree of uncertainty, the higher the level of return required by shareholders as they perceive their investment is of a higher risk. As insurers have no experience of the liabilities under the ELD or have access to any reliable statistical data, there is a considerable degree of uncertainty over the probable frequency or cost of claims. It follows, therefore, that should products emerge, there will be a heavy requirement for capital to support them and this will directly impact on the levels of premium that insurers require.

Insurance premiums have to cover a number a number of different costs:

- Claims costs, being the expected cost of all claims
- Technical reserves, being required by regulators to set aside funds to cover unpaid claims plus claims for losses that have occurred but have not yet been reported to the insurer
- Reinsurance costs, insurers need the support of reinsurers to enable them to absorb large, aggregated (from a common cause or in a particular location) and widespread liabilities
- Commission that is paid to agents and brokers that introduce business to the insurer
- Overheads and expenses
- Profit, some of which is paid to shareholders and the balance retained by the insurer

As the experience of insurers increases over time, it is possible that the capital requirements will change which could affect the levels of premiums required. However, in the early days of an emerging market, it must be expected that premium will be set at what might be termed cautious levels. The situation will be improved, however, if the transposition into national law closely mirrors the ELD and where the Member State has flexibility, the most conservative approach is implemented. For example, proportional liability rather than "joint and several" liability is likely to

result in lower premiums. Put simply, the more ambitious the national regime, the greater the uncertainty and volatility will be for insurers resulting in higher premiums, more restrictive cover or no products at all.

Article 14 of the ELD requires the Commission to produce a report by 30 April 2010 on, inter alia, “the availability at reasonable costs and on conditions of insurance.....”. This is a very difficult task as “reasonable costs” is highly subjective and must take into account a number of technical, legal and regulatory factors. Some of these have been dealt with briefly above but the EEWG will be keen to work with the Commission on this highly challenging obligation.

In addition to insurance premiums, it is also important to consider the financial amount of cover that may be available. All insurance policies will contain a financial limit representing the maximum amount the insurer will be liable to pay. The amount that each insurer will be willing to offer will vary according to the financial strength of the insurers and its underwriting principles. A key factor will also be the availability of reinsurance support and individual reinsurers will also wish to manage their own exposure to large or accumulated losses. Reinsurers will also wish to exercise some influence on how their capital is utilised and will support those insurers that can best demonstrate technical competence and a risk appetite that matches that of the reinsurer.

In some cases of environmental damage, a remediation may take a number of years to be fully completed. In some cases, it is a possibility that the funds provided by an insurance policy may prove to be insufficient but this is less likely to happen if operators can buy insurance in sufficient amounts. This means that there must be a number of insurers in the market offering cover that will enable the operator to buy protection from several insurers, if that is what he wishes to do. It is also important to bear in mind that large losses are not restricted to large businesses, insurers have learnt from a wide range of lines of business that small businesses do have large losses and the amount of cover to be made available should not be linked directly to the size of the operator.

Essentially, for there to be a true market, there needs to be sufficient number of insurers offering a range of products and in sufficient financial amounts for there to be competition and choice for the customer. We are a long way from that today but it is most likely to develop against the backdrop of a clear and predictable national framework for environmental liability that closely matches the ELD.

**All insurance policies will carry a financial limit of liability for the insurer**

**Competition should be promoted in this area**

## 8. Recommendations

The EEWG aims to further deepen the close cooperation with DG Environment and to support the national transposition authorities, through the national insurance associations, especially in the field of

- Sharing of updates on legal and insurance related developments within the Member States with a special focus on the challenges of cross-border activities and/or damage
- Supporting the elaboration of the report the Commission will have to present before 30 April 2010
- Developing plans for cooperating with competent authorities to agree methods to evaluate and restore environmental damage in the most effective and cost efficient manner

The development of insurance products will be enhanced if there is certainty on the scope of the underlying legal framework in the Member States. Furthermore the development of sustainable long lasting products must meet the criteria of insurability:

- Insurers need to set up possible methods for risk assessment and claims management and
- Lay the basis for calculating insurance costs.

To achieve this, insurers should (as a first step) consider the development of insurance products based on the scope of currently available products. The existing commercial liability insurance products provide coverage based on civil liability law for traditional damage as a consequence of a sudden and accidental pollution event. These products, for which the insurance industry has gained significant experience (e.g. loss frequency, loss severity, risk assessments tools, calculation of insurance costs) could serve as basis to extend the cover to features of the ELD (claims based on public law, new kinds of damages etc.) where appropriate.

The development of appropriate insurance products may take some time, depending from the different states of experience the different markets and insurers already have gained. The EEWG is convinced that within the context of a free market appropriate insurance solutions can be developed. Compulsory financial security would not support but impede these developing processes. It is recommended that transposition authorities follow the ELD very closely when implementing it into their national laws to encourage the development of insurance products.

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## 9.1 Transposition law process, CEA table

Transposition Table Directive 2004/35/CE @ 1st January 2007	State of the process / Comments on Legislative process	Extent of bio-diversity protected	Exemptions: - State of the art - Permit	Other extensions / restrictions (eg. historical contamination)	Financial security
<b>AUSTRIA</b>	A public draft is expected in the next few weeks.				
<b>BELGIUM</b>	Draft decree on environmental damage produced by the Flemish Minister for the Environment.				
<b>BULGARIA</b>	There exists an official draft on the environmental liability dated 26 September 2006 in line with main provisions of the ELD.	In line with the ELD.	No exemption.		Requirement for bank guarantee or insurance of the financial risk.
<b>CYPRUS</b>	A bill might be ready and a law be passed in February or March 2007.				
<b>CZECH REPUBLIC</b>	Ministry of Environment produced a draft Act on preventing and remedying of environmental damages (May 2006). Proposal subject to inter departmental proceeding for comments	Limited cover : identical to the Directive.	No exemptions for state of the Art but for Permit.		5 options for compulsory insurance.
<b>DENMARK</b>	Public draft - The proposals have been subject to a public comment period. A bill will be introduced in February 2007. Date of entry into force: 1st of April 2007.	To a degree an extended cover i.e. in some ways the implementation of the directive extends existing rules (extended implementation). Other elements are identical to the Directive.	Use of Art. 8 in drafts in some extend.	There are other more stringent provisions, and some rules are extended in use and cover.	A taskforce group is set, to explore the possibilities of an insurance option in future. No compulsory insurance schemes in draft proposal.
<b>ESTONIA</b>	The Ministry of Environment has prepared a preliminary draft, which is to be considered by policy-making authorities.				
<b>FINLAND</b>	A group in the ministry is still working (till of March 2007) to complete the draft law. A public hearing should be held in 2007.	Are encountering problems.			No compulsory insurance.
<b>FRANCE</b>	Official public draft dated 06 November 2006 (law + decree). Public consultation through the internet web site of the MEDD (Ministry of Ecology and Sustainable Development) from 06 to 27 November 2006. Expected agenda : deposit to the Parliament during the 1st quarter 2007. The law will be part of the French Environment Code with a new title VI called "Prevention and remedying of environmental damage".	The draft law lays down that the protected species and natural habitats will be defined in a list built by the MEDD. (There is no draft list up to now).	The draft law makes provisions: 1/ for the exemption for the state of the art 2/ not for the emission / event expressly authorized.	The draft law stipulates also that : 1/ in case of emergency, third parties like public bodies, public interest groups, NGO, professional syndicates, private owners affected or regions with a measure of autonomy, can propose the competent authority to do prevention and remediation works by themselves and ask later for repayment to the operator. 2/ costs linked to the information and consultation of the public and 3rd parties affected are part of the prevention and remediation costs.	The draft law doesn't stipulate any obligation regarding financial security.

<b>GERMANY</b>	Governmental draft 20 Sep. 2006; starting parliamentary process on 16/17. Jan. 07; adoption planned until May 07 <a href="http://www.bmu.de/gesetze_verordnu_ngen/bmudownloads/doc/35167.php">http://www.bmu.de/gesetze_verordnu_ngen/bmudownloads/doc/35167.php</a> .	Generally identical to the ELD, but Länder can extend.	No use of Art. 8 in the draft Competence Länder.	No extension/restriction.	No compulsory insurance / possibility given by legal basis.
<b>GREECE</b>	No information available.				
<b>HUNGARY</b>	Amendment of existing law: General Environmental Protection Act 1995 to transpose the ELD.	Like the ELD, land damages should have a significant impact on human health and in the use of remediation options by Competent authorities there will be cost criteria.	No exemption for the "state of the Art" but for Permit in cases where GMOs or untested pesticides created future problems.	HU law will be possibly less strict as regard the definition of the liable party but more stringent as regards the defenses.	The draft may contain compulsory financial insurance for a significant part of the Annex III activities.
<b>IRELAND</b>	No public draft Consultations were to be held last summer/early autumn 2006.				
<b>ITALY</b>	The ELD (Environmental Liability Directive) has been implemented in the Legislative Decree n. 152/2006, in the 6 <sup>th</sup> Part, entered into force on April 2006. The new government is studying some change to the Decree that will be probably ready on January 2007.	Same cover of the ELD, implemented in the 6 <sup>th</sup> part of the Decree 152/2006.	The Art. 8 of the ELD has been entirely transposed in the Art. 308 of the Decree 152/2006 without changes.	In the Decree 152/2006: - the Annex for the "occupational activities" misses, - the liability is only for fraud or guilt (no strict liability for the occupational activity) - there is an exclusion to the polluted sites where the procedures for the clean up have been already started.	No measure on Financial Security.
<b>LATVIA</b>	The Government adopted a bill. A law might have been passed by Parliament during the 3 <sup>rd</sup> quarter of 2006 (to be confirmed).				
<b>LITHUANIA</b>	Act on 24 March 2005.	Extended cover 4th category for damage to environment element + species habitat, water, soil.	No use of Art. 8.		No measure on Financial security.
<b>LUXEMBURG</b>	No information available.				
<b>MALTA</b>	No information available.				
<b>POLAND</b>	Public Draft (5 May 2006) Draft subject to consultations with stakeholders and general public; The government might act immediately. One example of transposition law going far beyond the scope of the ELD in various areas.	Damage to land not restricted to damage which presents a significant risk to human health.	State of the art / Permit exemptions adopted in the draft.	No joint and several liability Leave some issues to secondary legislation: activities covered by the ELD, triggers to require action, financial security.	Non compulsory Insurance.
<b>PORTUGAL</b>	No public draft.				
<b>ROMANIA</b>	A preliminary draft has been prepared to be subject to public consultation.				

SLOVAKIA	Draft of the national act has been returned to the Environmental Ministry to revision (state from December 2006).	In compliance with ELD.	In the first, non revised version of draft - 2 options: insurance or bank guarantee.
SLOVENIA	A study was undertaken to identify the measures necessary to ensure full implementation of the ELD.		
SPAIN	<p>In Oct. 2006, a draft of law was been passed by the Government.</p> <ul style="list-style-type: none"> <li>- Two official reports and inter ministerial discussions to follow.</li> <li>- Second approval by the Government is expected for Jan 2007 and then passed to Parliament, for discussion.</li> </ul>	<p>Protected species and habitats include not only those in Natura 2000, but also the ones declared by National and regional authorities. Include all species and habitats— extended cover.</p> <p>Permit defence and development risk defence are in place, but the exemption is limited in two ways:</p> <ul style="list-style-type: none"> <li>- It affects to recovery costs; not to prevention.</li> <li>- The operator has to pay costs and then he is entitled to recover them from the Public Administration.</li> </ul> <p>State of the art / Permit exemptions.</p>	<p>Mandatory financial scheme will be established as of April 2010;</p> <p>Three options: a) insurance;- b) Bank bond.- c) Assets deposit.</p> <p>Amounts from 300.000 € to 20.000.000 €, according to risk level.</p> <p>This is to be determined, using a risk assessment method to be ruled before Dec. 2008.</p>
SWEDEN	<p>A Governmental investigation has come up with a suggestion how to implement the ELD in the Swedish environmental legislation.</p> <p>The report has been circled for opinion and the Swedish Insurance Federation has been supporting most of the suggestions regarding the implementation of the directive.</p> <p>The Swedish Government has, however, not yet given an own proposition of the implementation of the directive. Such proposition is said to be given during the spring and the law is by the Government estimated to come into force in August 2007.</p> <p>Report produced by an ad hoc commission composed of civil servants and experts</p> <p>Report subject to comments from different stakeholders.</p>	<p>In the report , it is suggested that there should not be any prescription period regarding the damages on biodiversity, which is in line with the previous legislation on the environmental liability.</p>	<p>The above mentioned Governmental investigation is still working with discussions regarding the financial security of the environmental liability.</p> <p>There might be a subsidiary mandatory insurance protection in the case the producer has no ability to reimburse the actions taken to remedy the damage.</p> <p>A report will be issued by the end of April 2007.</p>
NETHERLAND	Draft Bill Proposals submitted to Council of State.	No more than ELD.	No compulsory Insurance.
UNITED KINGDOM	<p>No official draft</p> <p><a href="http://www.defra.gov.uk/environment/liability/index.htm#1">http://www.defra.gov.uk/environment/liability/index.htm#1</a></p> <p>A consultation process began in July/August. Second consultation on draft winter 2006/2007.</p>	<p>The Government is consulting on whether there should be any extensions to requirements of the directive.</p>	<p>The Government has made it clear that there will be no compulsory insurance.</p>

### Disclaimer:

"All aforementioned information set up in this transposition table come from various sources. Since the content displayed therein may be incomplete or inaccurate, the CEA transposition table can only serve as indications of the implementation status within some Member States as at 1<sup>st</sup> January 2007. The CEA therefore explicitly declines any liability of whatsoever nature which might arise from them".

## 9.2 Sandoz/Doñana case study

### ANALYSIS OF CLAIM EXPENSES

SANDOZ <sup>1</sup>	AMOUNT AND CATEGORY OF EXPENSE (amounts in Euros)							ESTIMATED PERIOD OF INTERIM LOSSES	WHO PAID	RESPONSIBLE PARTY ACCORDING TO THE DIRECTIVE
	1	2	3	4	5	6	7			
Measures/claims										
Emergency/preventive measures										
- recovery and cleaning up of debris		12'900'000							Polluter	Polluter
Damage to soil										
- remediation/clean-up of contaminated soil in the own premises, ordered by public authority due to danger to human health		39'000'000							Polluter	Polluter
Damage to water										
Primary remediation			27'000'000						Polluter	Polluter
Complementary remediation										
Compensatory remediation										
Damage to protected species/habitats										
Primary remediation										
Complementary remediation										
Compensatory remediation										
Compensation of civil liability claims										
- Bodily injury										
- Property Damages										
- Financial Losses										
- Others:										
Loss of enjoyment										
Loss of use of the environment										
TOTALS	0	51'900'000	27'000'000	0	0		0	GRAND TOTAL		78'900'000

<sup>1</sup>The fire in 1986 in the warehouse of Sandoz AG Schweizerhalle (Switzerland) storing agriculture chemicals led to a heavy pollution of the river Rhine – from Switzerland down to the Netherlands. The fire extinguishing water discharged several tons of chemicals into the Rhine over a period of more than 24 hours and seriously damaged the aquatic flora and fauna and killed several tons of fish

BOLIDEN <sup>1</sup>	AMOUNT AND CLASS OF EXPENSE (amounts in Euros)							ESTIMATED PERIOD INTERIM LOSSES	WHO PAID	LIABLE PARTY ACCORDING TO ELD
	1	2	3	4	5	6	7			
	1. Expenses to avoid imminent damages 2. Expenses minimization measures. 3. Expenses primary restoration 4. Expenses complementary restoration 5- Expenses compensatory restoration 6. Generic expenses (Legal, investigation of damages caused, claim adjustment, etc.) 7. Expenses and indemnities 3rd. Party liability									
MEASURES/ CLAIMS/ INCURRED EXPENSES										
Indemnity for loss of crops							10'220'000		Boliden	Boliden
Clean-up of Boliden's site soil									Boliden	Boliden
Surface clean-up of affected ground and river bed (deposed wastes).			43'300'000						Junta Andalucía	Boliden
Build up of a depurating plant for contained polluted water.			7'861'000						Ministerio de Medio Amb.	Boliden
Depuration process of contained polluted water.										
Build up of a wall to protect the limit of the natural park from further polluted water spilled during the clean-up period		3'880'000							Ministerio de Medio Amb.	
Analytic controls of surface and underground waters			4'207'000						Ministerio de Medio Amb.	
Neutralization of polluted soils with basic products, to fix remaining pollution.			14'425'000						Junta Andalucía	Boliden
Expropriation of private-owned affected grounds to change their dedication into public natural park. Riverside				1'800'000					Conf Hidrogr. Guadalquivir	Boliden
Expropriation of private-owned affected grounds to change their dedication into public natural park. Other.				66'110'000					Junta Andalucía	Boliden
Reforestation of the affected grounds			22'021'000						Junta Andalucía	Boliden
Subsequent analytic monitoring						4'570'000			Junta Andalucía	Boliden
Investigation and working program for restoration			5'547'000							
Technical assistance						2'885'000			various	Boliden
Sanitary controls for employees water for human consumption and food									Consejería de Salud.	Boliden
<b>TOTALS</b>	<b>0</b>	<b>3'880'000</b>	<b>97'361'000</b>	<b>67'910'000</b>	<b>0</b>	<b>7'455'000</b>	<b>10'220'000</b>	<b>GRAND TOTAL</b>	<b>186'826'000</b>	

<sup>1</sup> The collapse of a waste retention dam of a mining complex (Boliden Apirsa SL, Aznalcóllar Spain) in 1998 resulted in a sludge flood which contaminated a large surface area partially used by farmers, killed all aquatic life which came into contact with the sludge in two nearby rivers and threatened the Doñana National Park - a Natura 2000 site. Due to the swift intervention of the State authorities a large pollution of the National Park was prevented. However a significant area of wetland known as 'The Entremuros' - protected as Special Protection Area (SPA) under the Wild Bird Directive - was affected by the spill.

### 9.3 Golf course case

## Golf Course case

## AIMS & OBJECTIVES

The aim of this orientation paper is to identify some of the likely environmental impacts following a spill event from an industrial facility. A case study scenario was developed for this paper from a number of real-life environmental damage events in order to highlight key aspects of the Environmental Liability Directive (ELD) 2004/35/CE.

On the basis of the case study events and resulting environmental impacts, this paper explores and quantifies the likely expenses incurred as a result of the spill event.

The paper also provides a comprehensive review of the identified impacts and associated costs from an insurance perspective by discussing key areas relating to how interim losses, as defined in the ELD, are estimated and the consequences for managing the evaluation process.

Recommendations are made on the basis of our observations.

It should be noted that two key assumptions have been made in preparing this paper;

1. Baseline conditions are not known at the time of the spill and will require determination.
2. Interim Losses will need to be calculated for the resource loss associated with the case study wetland and estuary.

## TABLE OF CONTENTS

Details

Page No.

1	Summary of the Spill Event	32
1.1	Site Location and Description	32
1.2	The Spill Event	34
1.3	General Source-Pathway-Receptor Relationships	34
2	Regulatory Response	35
3	Investigation and Remediation Works	35
3.1	On-Site – Investigation and Remediation	35
3.2	X River/Lake Assessment and Remediation	36
3.3	Prevention Measures	36
4	Remediation Management	37
4.1	Preventative Measures	37
4.2	Preliminary Investigation	38
4.3	Remediation Scoping	38
4.4	Service Suppliers Costs for Remediation & Validation	38
4.5	Legal Assistance	38
4.6	Litigation Defence Costs	39
4.7	Third Party Damage Claims	39
4.8	Loss of Income	39
4.9	Cirisis Communication Expenses	39
4.10	Site Specific Miscellaneous	40
4.11	Post Remedial Operation and Monitoring	40
5	Insurance Perspective	40
5.1	Appropriate Estimation of Loss	41
5.2	Relative Importance of Post-Spill Environmental management Costs	44
5.3	Managing the Defence & Evaluation Process	44
6	Recommendations	45

# DIESEL GAS OIL SPILL FROM AN IPPC LICENSED INDUSTRY

## 1.0 Summary of the Spill Event

### 1.1 Site Location and Description (see plan on page 33)

The X IPPC Industry Ltd., Anywhere Road premises (the site) is located approximately 1.5 km south of the S-Coast Estuary, a Special Protection Area (SPA) which discharges to the North Sea.

The site is surrounded by residential properties, commercial and industrial and undeveloped pastureland

The X River/Lake System traverses the southern end of the site, and from there meanders an approximate distance of 3 km north-eastwards where it discharges to the S-Coast Estuary. A Golf Course is located less than 500 metres down stream of the site and the X River/Lake System flows for a distance of approximately 1 km through a series of lakes located within the golf course grounds.

The X IPPC Industry Ltd. site covers an approximate area of 31 acres and is elevated approximately 20 metres above sea level. Generally the site is flat with a south trending gradient.

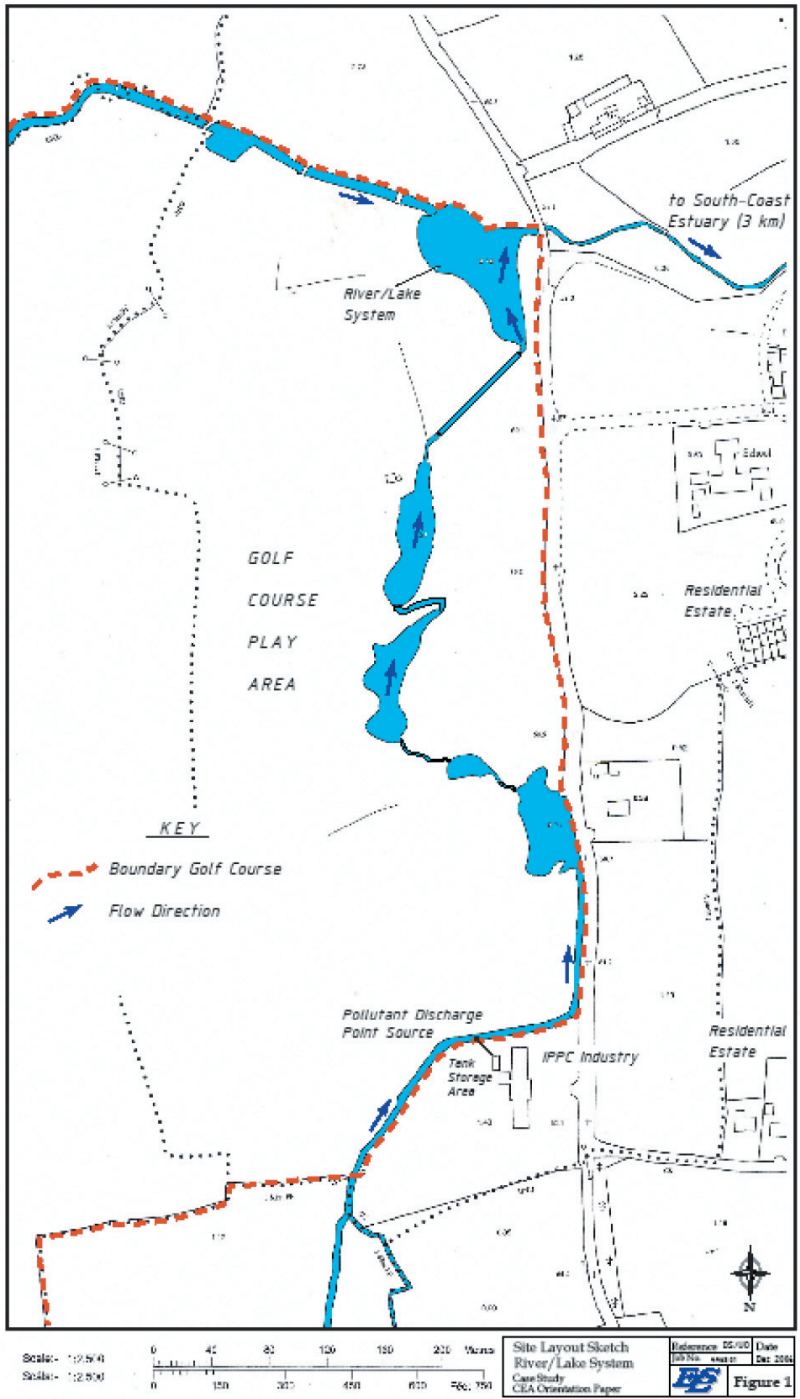
The X IPPC Industry Ltd. facility includes manufacturing and packaging processes for a range of pharmaceutical products and treatments. The site buildings include the Material Handling Facility (MHF) Building, a manufacturing area, laboratories, administration offices and a canteen area.

The site buildings are surrounded by the car parking area to the north, the loading area to the southwest, and grassed undeveloped property to the south. The surface of the site includes concrete, tarmacadam, brick pavement and lawn/undeveloped land to the south of the building.

Two (2) No. interceptors are present beneath the site in the area loading bay area and at the car park. Storage of chemicals and fuels for the site manufacturing processes include two main areas, as follows:

- (1)The gas oil diesel fuel storage area at the south end of the buildings, and
- (2)The 'low flashpoint' storage area located at the northwest corner of the MHF Building, adjacent to the water-holding tank.

The diesel fuel storage area is located at the south end of the manufacturing area. It comprises two No. 12,000 litre vertical above ground storage tanks (ASTs). The tanks were installed c. 1989 and are single-skinned. The tanks are interconnected by a balance line located between the tanks and also via a feeder line that exits the bund. The feeder line from the tanks is connected to four (4) No. Boilers which supply heat for the site buildings.



Site Sketch of the IPPC Industry and impacted site

The tanks are located within a concrete structure designed for retaining aqueous liquids (a bund). This purpose of this secondary containment facility is to provide local containment in the event of a loss of containment in the tanks or pipe work located within the bund.

The bund area is located adjacent to the site buildings and houses both tanks. The bund was installed c. 1989, the same time as the storage tanks. A number of issues concerning the bund were identified during the site assessment including:

- The bund was not roofed and a pump was used to periodically remove any rain-water contained within it. Any oily water removed from the bund during these operations was stored for subsequent recovery/disposal off-site.
- A general observation of the bund showed evidence of surface joints or cracks, and there was evidence of staining or surface deterioration of the walls and floor.
- Installations were found to penetrate the bund structure including the fill points, an old sealed pipe, and the disused feeder pipe to the old back-up generator.
- Electrical installations were located on the inside of the bund wall.

## 1.2 The Spill Event

A release of approximately 20,000 litres of gas oil diesel occurred on 1 May 2007 during bund upgrade works. The incident occurred through a disused supply pipe which was formerly used to supply oil from the tanks to a standby generator.

Following identification of the release, and as soon as it was practicable to do so, site management notified the local authority in accordance with the relevant regulatory requirements.

Following further investigation it was determined that the escaped fuel oil migrated to the nearby surface water culvert and flowed in a south-easterly direction across the site, discharging to the X River/Lake System. The culvert was not connected to any of the on-site interceptors.

## 1.3 General Source-Pathway-Receptor Relationships

Diesel gas oils are middle distillates mainly in the carbon range C9 to C25. In accordance with Directive 1999/45/EC, the category of danger of the substance is classified as: Carcinogenic Category 3, Harmful, and Dangerous for the Environment. The substance is toxic to aquatic organisms, and may cause long-term adverse effects in the aquatic environment.

Following a detailed characterisation investigation and risk assessment of the source site and the X River/Lake System, five primary receptor groups impacted by the release of fuel at the site were identified, as follows:

- (1) The site occupants,
- (2) The buildings located on site, and
- (3) Controlled waters (soil & groundwater and surface water).

The impact to controlled waters resulted in damage to two additional primary receptor groups identified as:

- (4) The downstream Ryder Cup Approved (RCA) Golf Course; and
- (5) The S-Coast Estuary, an SPA

## 2 Regulatory Response

IPPC management reacted immediately to the incident by providing emergency measures to limit the extent of the incident. Soon afterwards, the Regulatory Authority, Environmental Services Department issued a Notice to X IPPC Industry Ltd ordering the company to:

- (a) Remediate the site to ensure there was no human health based risk to site users and also that the risk of ongoing contamination migration from the site was removed; and
- (b) Undertake emergency response action along the X River/Lake System, including the deployment of oil absorbent booms at strategic locations along the river; and
- (c) Carry out an assessment of the river/lake system, with particular regard to assessing the adverse impacts to the downstream RCA Golf Course and the S-Coast Estuary; and
- (d) Undertake appropriate remedial action to remedy the adverse impacts of the petroleum contamination, in accordance with the requirements of the Environmental Liability Directive 2004; and
- (e) Undertake appropriate preventative measures against the risk of a spill reoccurring.

## 3 Investigation and Remediation Works

### 3.1 On-Site – Investigation and Remediation

Following an on-site investigation and risk assessment, the following remediation methods were employed at the X IPPC Industry site:

- Installation of a vapour extraction system for emergency control of indoor vapours,

- Remediation of contaminated soil and groundwater (excavation and disposal and pump and treat)

### 3.2 X River/Lake Assessment and Remediation

In response to the Regulatory Authority Notice, the following actions were undertaken along the downstream areas of the River/Lake System and the S-Coast Estuary with regard to the environmental impacts associated with the oil spill event:

- Emergency response measures to clean-up stream – including deployment of booms and vacuum pumps
- Characterisation of River/Lake System Sediment and surface water relative to baseline conditions in the Estuary,
- Definition of the objectives of remediation, i.e. to return the downstream receptors to baseline conditions and options appraisal,
- Assessment of 'interim losses' i.e. loss of habitat, feeding grounds, spawning grounds
- Primary remediation of River/Lake System – in-situ chemical and biological methods
- playing grounds, loss of water source, health risk to members and maintenance staff
- Complementary remediation – removal of flood defences along the edges of the S-Coast Estuary to allow re-habitation by estuarine plant and wildlife over a 10 hectare area

Other assessments related to the specific circumstances of the RCA Golf Club included:

- Assessment of the 'business loss' i.e. reduction in membership fees, increased maintenance fees and cost of replacing lost water source for irrigation of the Golf Course, and
- A health risk assessment associated with the oil spill damage relative to Golf Club staff and Golfing Members.

### 3.3 Prevention Measures

Preventative measures at X IPPC Industry Ltd. undertaken included:

- Connection of all surface discharge pipes to full retention interceptors,
- Review of X IPPC Industry Ltd.'s fuel storage requirements resulting in the reduction of overall fuel quantities stored at the site,
- Bund upgrade works undertaken in accordance with best practice and guidance,
- Assessment and evaluation of the fuel storage related activities (e.g. monitoring and maintenance), tank, bund and pipe-work conditions, in accordance with best practice and guidance,

## 4.0 Post-Spill Environmental Management & Associated Costs

As illustrated in the case study, following an environmental incident, the responsible party is faced with a range of actions, which can be broadly summarised as follows:

- Reduce the extent of the pollution
- Investigate and repair the causes of the spill event
- Evaluate the scope of damages to the soil, water, air and other natural resources
- Agree on a remediation solution with the regulators
- Select contractors and commission the work
- Via their insurers handle possible third party claims and defend or indemnify
- Maintain the company's reputation through a communication process with the public and the media

All these actions involve capital expenditures. Some of these costs are insurable and some are not. To be exhaustive, all expenses related to a remediation project, are listed below, whether they are connected to the ELD or not, and whether insurance products to cover them exist or not. These costs are detailed further below. All figures are in euros and represent the best estimates of the authors, based on their long experience in large and small remediation projects.

### 4.1 Mitigation measures

There are two types of mitigation measures:

- Those covering actions agreed with the public emergency response team and the authorities to limit the extent of the pollution. They include containment, protection, monitoring and supervision. They usually last for a few days but can extend much longer in the case of a major spill or depending upon local conditions, until the sources of the damages are identified, taken care of and a proper remediation method is agreed to.
- Those covering actions to identify the causes of the damage and repair the deficient equipment. This may imply compliance with new regulations and meeting additional technical items imposed by the regulators.

Cost evaluation for specific case study:	2 million
Range of evaluation in general:	5 to 10 million

*"All figures mentioned herein are in EUR"*

## 4.2 Preliminary investigation

These costs are related to the hiring of consultants and specialists to perform a preliminary investigation of the extent of the pollution. It includes a site visit, a review of the site history and recommendations regarding the scope of the detailed investigation necessary.

Cost evaluation for specific case study:	0,5 million
Range of evaluation in general:	0,5 to 2 million

*"All figures mentioned herein are in EUR"*

## 4.3 Remediation Possible Solutions Investigation

Following the preliminary investigation, agreeing on a remediation solution with the authorities can be a lengthy, difficult and sometime expensive exercise. This requires the involvement of consultants, field contractors, laboratories and other specialists. Pilot test studies are often required. There always several technical options to remediate an environmental damage. They differ in performance objectives, timing of implementation and naturally costs. It may take from several months to several years to agree on the "best" remediation solution to be implemented.

The new ELD is directly impacting these costs, since a proper evaluation of natural resources damages and possible remedial solutions need to be debated and agreed.

Cost evaluation for specific case study:	0,5 million
Range of evaluation in general:	0,5 to 2 million

*"All figures mentioned herein are in EUR"*

## 4.4 Remediation implementation and validation

These are the actual costs related to the remediation. They include the use of contractors, the supervision of consultants and other specialists, architects, landscape designers, laboratories. Additional costs should be expected for the validation of the remediation

Cost evaluation for specific case study:	8 to 10 million
Range of evaluation in general:	0,5 to 150 million

*"All figures mentioned herein are in EUR"*

## 4.5 Legal Assistance

While negotiating with the regulators it is advisable to secure the assistance of experienced legal advisors for interpretation and negotiation of the environmental laws and regulations, review documents and reports to reduce liability exposure.

Cost evaluation for specific case study:	0,2 million
Range of evaluation in general :	1 to 5 million

*"All figures mentioned herein are in EUR"*

#### 4.6 Litigation defense costs

After an environmental incident, third party claims are often customary. This may include class actions where permitted. Each claim should be reviewed and defended individually.

The ELD will certainly be generating different types of claims by the public and NGOs, which may be longer and more difficult to investigate and to defend.

Cost evaluation for specific case study:	0,5 million
Range of evaluation in general:	1 to 25 million

*"All figures mentioned herein are in EUR"*

#### 4.7 Third Party damage claims

These are the actual settlements of third party claims. Claims can originate from NGOs. The ELD can substantially increase these claims since it now includes damages to natural resources.

Cost evaluation for specific case study:	1 million
Range of evaluation in general:	1 to 25 million

*"All figures mentioned herein are in EUR"*

#### 4.8 Loss of Income

This would be significant loss of income for the potentially responsible party, due to temporary or permanent shutdown of operations following an environmental incident.

Cost evaluation for specific case study:	0,5 million
Range of evaluation in general:	0,5 to 50 million

*"All figures mentioned herein are in EUR"*

#### 4.9 Crisis Communication expenses

A good communication system is essential, preferably, but certainly during and after an environmental incident (particularly if claims from NGOs are involved). This includes the hiring of specialized crisis communication consultant, regular meetings with the public and media, as well as preparation and distribution of pamphlets and brochures, internet site etc.

Cost evaluation for specific case study:	0,1 million
Range of evaluation in general:	1 to 5 million

*"All figures mentioned herein are in EUR"*

## 4.10 Miscellaneous

These are miscellaneous costs incurred during the pre remediation and the remediation phases and include items such as:

- 1) Travel expenses (can be important if site is isolated)
- 2) Fines, penalties paid to authorities for late work, missed deadlines
- 3) Insurance premiums for clean up operations

Cost evaluation for specific case study:	0,5 million
Range of evaluation in general:	0,5 to 10 million

*"All figures mentioned herein are in EUR"*

## 4.11 Operation and Monitoring after remediation

Once remediation is complete, the site has to be monitored and maintained for a long period extending often over several years. Costs are incurred on an annual basis and are recurring. They can be substantial when calculated on a Net Present Value basis.

Cost evaluation for specific case study:	0,5 million
Range of evaluation in general:	1 to 5 million

*"All figures mentioned herein are in EUR"*

If, after a few years of monitoring, it appears that objectives have not been met or indicators are deteriorating, additional expenses may be involved or restarting the process outlined in 4.3 may be necessary.

As can be seen from the above costs vary widely if they concern an accident or a continuous pollution over several years (several incidents and accumulation). However, since the ELD will be implemented in 2007 and is not retroactive, gradual pollution issues may not be expected for some time after the inception of the ELD. The implementation of the ELD will have an impact on most of the costs identified, particularly in the assessment phase of natural resources damages. One of the risks is that the costs for evaluating the damages and agreeing on a remediation methodology will be higher than the remediation itself. It is therefore particularly important to standardize applicable methodology before hand.

## 5 Insurance Perspective

The case study raises some interesting issues from an insurers' perspective. While specific issues such as coverage and claims handling protocols are dealt with in other chapters, we intend to examine the above loss from several standpoints;

- Appropriate Estimation of Loss;
- Relative Importance of Post-Spill Environmental Management Costs
- Managing the Defence and Evaluation Process;

It should also be considered that this section only concerns itself with those losses highlighted in the case study but relevant to the ELD. It should be borne in mind by the reader that other losses, such as those listed below, will still be incurred;

- Property Damage;
- Business Interruption;
- Future prevention of loss;

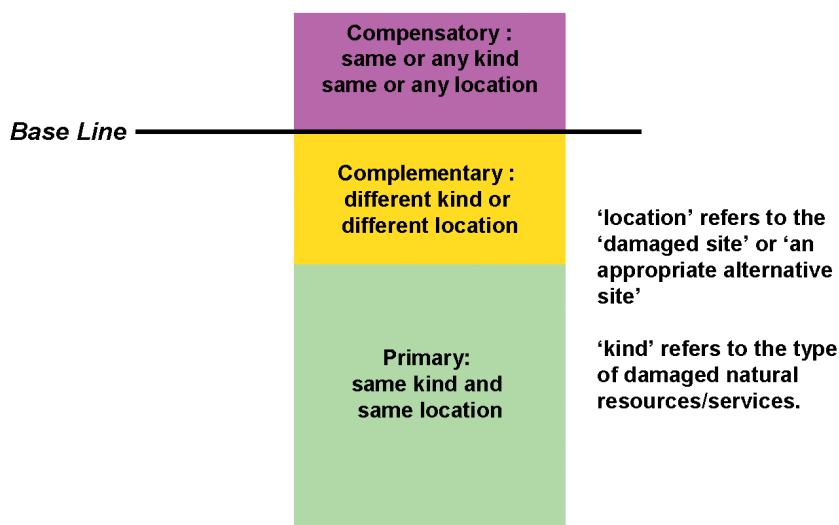
## 5.1 Appropriate Estimation of Loss

Section 1.3 identified five primary receptor groups impacted by the release of fuel at the site:

- (1) The site occupants,
- (2) The buildings located on site, and
- (3) Controlled waters (soil & groundwater and surface water).
- (4) The downstream Ryder Cup Approved (RCA) Golf Course, and
- (5) The S-Coast Estuary, an SPA

The ELD requires that environmental damage to these receptors should be considered in the context of the three types of remediation specified by the ELD – Primary, Complementary and Compensatory remediation. They can be summarised in the diagram below:

### ELD : 3 types of remediations



In the context of the ELD, a “Primary Restoration” type approach will more than likely apply to losses incurred under receptor groups 1 and 3;

- Site occupants can be dealt with using existing best practice in treatment / rehabilitation for injury;
- Controlled waters and soil can be cleaned up using suitable technologies such that the site is suitable for its intended use and that the contamination no longer poses a significant risk of causing significant harm to the surrounding environment;

Where loss estimation becomes more complex is with receptor 5 (Estuary SPA) and with receptor 4 (to the extent that the stream will take a while to recover from the gas oil release). While there will be some restoration type expenses that will apply, for example the removal of flood defences to allow the rehabilitation of estuarine plant and wildlife affected by the spill event, environmental damage to these protected species and habitats, or Interim Loss as defined by the ELD, requires quantification to establish the full extent of compensation required. Relative to these, estimation of the more “Primary Restoration” type losses referred to above is straightforward as the technologies and methods are more established. The following section concerns itself with calculation of the more subjective, non-Primary losses.

#### 5.1.1 Responding in Kind – Non Primary Losses

Compensating for damage to natural resources / protected species was originally championed in the USA and their experience appears to indicate that a resource to resource / service to service approach is the only way to estimate losses associated with the damage to the estuary and the aquatic environment of the river.

The tool used to calculate this “loss of service / resource” is Habitat Equivalency Analysis (HEA); a mathematical formula which can, on the basis of a few key variables, provide an estimate of the Interim Loss. While the ELD implies the use of HEA, its intent is for HEA to be used to calculate both Compensatory and certain elements of Complementary remediation where, in addition to items such as the removal of the flood defence to allow reinstatement of the tidal marshes, there is a requirement to determine how many units of the restored habitat equals one unit of the damaged resource at the subject site - an “Exchange Factor”.

While a relatively simple formula, use of HEA still requires an understanding of baseline conditions, the extent of the damage and the likely period of time to reinstate. Such information may not always be readily available and if required will invariably require considerable efforts to calculate (in the case study, such information would have to be obtained). In addition the “Exchange Rate” is a very site-specific and subjective item to determine. All of these pose difficulties to Insurers when required to estimate / price for such losses as data on such issues is not readily available and expensive and lengthy to obtain.

In addition to the above, there are three principal areas where care should be taken when using HEA;

1. Double Recovery – a concern has been voiced by Desvouses<sup>(1)</sup> that HEA will not enable the disassociation between complementary and compensatory remediation, thereby duplicating the loss and “double counting” if the complementary remedial measures had already been funded. In the case study above we refer to complementary remediation incorporating the removal of flood defences along the edges of the S-Coast Estuary to allow re-habitation by estuarine plant and wildlife. Desvouses warns that the HEA approach will generate a value for Interim Loss (including the above) that would include the above. While a valid point, in practice double recovery should be straightforward to avoid by accounting for monies already spent on complementary remediation once Interim Loss has been calculated. Such an approach allows for urgent complementary remedial measures to be undertaken without having to wait for HEA to be completed. Where there may be a greater potential for Double Recovery, it is the ELD’s intent to require the calculation of non-Primary losses for each and every kind of species / resource that has suffered damage, as opposed to selecting a key indicator species. One form of remediation may benefit more than one species and HEA does not take account of this, thereby running the risk of duplicating losses.
2. The loss estimation process should take account of the condition of the resource “but for” the damage, which, in calculating Interim loss should include for the fact that the resource may have naturally deteriorated over the time between when the damage occurred and the restoration was completed.
3. Use of the HEA formula – Calculating non-Primary losses using HEA has various outcomes depending on the zero-point selected, the reference point and the discount rate. In the context of the case study, all of these will require determination after the point of loss and while from an insurers standpoint, where they are expected to pay, the emphasis will be placed on minimising the expense while achieving the remedial goals, the Competent Authority may have a different view. As such there will be a level of negotiation that is likely to be required, which makes estimation of these losses ambiguous and therefore difficult to insure.
4. As an extension of point 3 above, in the case of Public Liability insurance policies, which are usually written on a claims occurring basis, there is the added difficulty in attributing losses to a particular period of insurance. Environmental Impairment Liability policies tend to be written on a “claims made and reported” basis so the policy in effect at the time the third party claim is received would be the one that responded. In the case of the occurrence wordings, whichever reference point is selected will have a bearing on which policy will be claimed upon – this will be a process of negotiation between the Insurer, Competent Authority and other relevant parties, but again it is extremely difficult to predict likely losses in advance as each negotiation will be specific to a particular loss event.

## 5.2 Relative Importance of Post-Spill Environmental Management Costs

As an exercise in prioritising the post-spill environmental management costs we have taken the costs identified in Section 4 and ranked below in order of highest urgency first. An assumption made in preparing this list is that the polluter has acted in a proactive manner to deal with the pollution release, in cooperation with the Competent Authority, thereby avoiding any legal proceedings until after the remediation.

It should be borne in mind that these costs are from an insurance perspective only and that other stakeholders will more than likely have different opinions;

1. Crisis Communication expenses / Preventive measures
2. Preliminary Investigation / Legal Assistance
3. Third Party Damage claims / Loss of Income
4. Remediation solution investigation
5. Service suppliers costs for remediation implementation and validation
6. Miscellaneous
7. Litigation defense costs
8. Operation and Monitoring after remediation

While the ELD, and the resulting restoration of, and compensation for, environmental damage, are central to this paper, it is important from an insurance perspective that attention should not be diverted from initial management / containment of any loss, which is crucial element of post-spill management. There are a number of expenses highlighted in Section 4 that are not dealt with within the ELD but this does not make the expense, or the management of this expense, any less valid. This will be discussed in more detail in the Section on Claims protocols and procedures.

## 5.3 Managing the Defence & Evaluation Process

One of the benefits of HEA that has already been discussed is that it allows a relatively straightforward calculation of Interim Loss, albeit that the information required to input into the formula is not always readily at hand. This potentially allows efficient determination of Interim Loss / non-Primary losses without lengthy investigation although it is accepted that there may be occasions where detailed investigation is the only option.

Where detailed investigation is required, and on the basis that many policies extend to defence / evaluation costs, it is in insurers interests to keep this process as efficient as possible. This means that robust advice on such issues and working knowledge of the approaches considered in the Desvousges paper and the EU non-paper must be readily available. While the potential demand for such services is yet to be determined, a concern would be that there is insufficient expertise available in the use of such methodologies.

## 6 Recommendations based on the Golf course case

On the basis of the above the following recommendations are presented:

1. Market capacity is an issue to be considered. If loss determination / estimation becomes significantly more protracted than the norm, then defence and evaluation payments potentially covered under the policy will increase, which one anticipates will have knock-on effects on pricing and market capacity. While the costs identified in Section 4 are indicative, they point to significant losses and if future experience shows these estimates to be accurate, then this will increase the demand for capacity for environmental losses. Loss estimation should therefore be as efficient as possible to minimise loss as far as practicable
2. The complexity and potentially long-term nature of possible losses covered under the ELD creates solvency / capital issues for insurers. One possible outcome of this is that it may encourage insurers to settle with the Operator to avoid costly, long-term actions that could use up the entire limits on the policy. It is important that the process needs to be managed efficiently at Member State level so as to avoid such an outcome, which would be at odds with the intent of the ELD
3. The identity of the Competent Authority should be determined more closely. Its competence should be wide enough that a polluter (or indeed their insurer) should be able to act on a "voluntary" or proactive basis, with the knowledge of the regulatory authority, without having to repeatedly wait for regulatory approval. Red Tape should not preclude the efficient handling of a pollution incident. To that end, generally acceptable evaluation methods should be agreed to before hand, with little discretion left with local authorities. The potential use of "extreme methodologies should be avoided and we suggest the use of Habitat Equivalency Analysis as a means to calculate Interim Loss
4. One of the risks is that the costs for evaluating the damages and agreeing on a remediation methodology will be higher than the remediation itself. It is therefore particularly important to standardize applicable methodology before hand
5. Concern over quantifying Interim Loss should not detract from the initial management / containment of any loss, which is a crucial element of post-spill management
6. There appears to be an absence of case studies / precedents in Europe that deal with the application of HEA. Consideration should be given to a pilot study using a suitable live case
7. Interim Loss estimation should take account of the condition of the resource "but for" the damage.

8. Proper Risk management, damage evaluation, remediation plans and fulfillment will result in proper costs and thus in:
- Adjusted insurance premiums,
  - Proper warranty amounts, and
  - Wider insurance availability.



## 9.4. List of the CEA-EEWG

### GENERAL LIABILITY INSURANCE COMMITTEE

#### CEA Environmental Experts Working Group's members

CH Working Group leader	Mr Bernard Tettamanti Director Deputy Head Americas Casualty Swiss Reinsurance Company <b>Swiss Association/Swiss Re</b> Mythenquai 50/60 CH - 8022 Zurich
CH	Mr Jürg Busenhart Vice president <b>Swiss Reinsurance Company</b> Mythenquai 50/60 CH - 8022 Zurich
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