



# Remediation contracts regarding contaminated sites

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SCHOOL OF SCIENCE & TECHNOLOGY

A thesis submitted for the degree of

*Master of Science (MSc) in Energy Systems*

OCTOBER 2011

THESSALONIKI – GREECE



INTERNATIONAL  
HELLENIC  
UNIVERSITY

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DISCLAIMER

This dissertation is submitted in part candidacy for the degree of Master of Science in Energy Systems, from the School of Science and Technology of the International Hellenic University, Thessaloniki, Greece. The views expressed in the dissertation are those of the author entirely and no endorsement of these views is implied by the said University or its staff.

This work has not been submitted either in whole or in part, for any other degree at this or any other university.

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# Abstract

The main purpose of this work is to present the importance and necessity of a legislative regulation on remedial action concerning contaminated land. The first introductory chapter includes the concepts and definitions of land contamination and brief remediation legislation in North America and Western Europe. The second chapter presents the advantages of remediation.

The third and fourth chapters are describing the contents, scope and level of a remedial contract and provide information for each one of the different contract types. In the fifth chapter Germany's remediation planning is presented. Chapter six analyses the legislative framework relevant to soil remediation in Greece. The conclusions are included in the final chapter.

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Christina Strapatsa

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# Contents

<b>ABSTRACT .....</b>	<b>IV</b>
<b>CONTENTS .....</b>	<b>V</b>
<b>1 CONCEPTS AND DEFINITIONS OF TERMS.....</b>	<b>1</b>
1.1 INTRODUCTION .....	1
1.2 CONSPECTUS OF LEGISLATION CONCERNING CONTAMINATED SITES AND ITS IMPLEMENTATION	
1	
1.2.1 <i>Terminology</i> .....	2
1.2.2 <i>Identification of Contaminated sites</i> .....	3
1.2.3 <i>Remediation liability</i> .....	7
<b>2 ADVANTAGES OF REMEDIATION .....</b>	<b>12</b>
2.1 IMPORTANT AS PRECONCEPTION: ADMINISTRATIVE DISCRETION IN DETERMINING THE PERSON	
IN CHARGE OF REMEDIATION .....	12
2.1.1 <i>Imposition of remediation measures</i> .....	12
2.2 THE SPECIFIC ADVANTAGES OF A REMEDIATION CONTRACT.....	13
2.2.1 <i>Use in practice</i> .....	14
2.2.2 <i>For public (environmental) authorities</i> .....	15
2.2.3 <i>For the (supposed as) liable parties</i> .....	15
<b>3 CONTENTS AND CONDUCT REMEDIATION .....</b>	<b>17</b>
3.1 SCOPE AND LEVEL OF REMEDIATION .....	17
3.2 REMEDIATION SCOPE CONCERNS IN SOIL REMEDIATION CONTRACTS.....	18
3.3 REMEDIATION LEVEL CONCERNS IN SOIL REMEDIATION CONTRACTS.....	21
3.4 DRAFTING THE SCOPE AND LEVEL OF REMEDIATION CONTRACT TERMS .....	21
3.5 INTRODUCTION .....	23

3.6	AIMS OF REMEDIATION, REMEDIATION CONCEPT .....	23
3.7	IMPLEMENTATION OF REMEDIATION .....	24
3.8	CONFIRMATION OF REMEDIATION .....	25
3.9	MEASURES BY REGULATORY AUTHORITIES.....	25
3.10	MISCELLANEOUS.....	26
<b>4</b>	<b>CONTRACT TYPOLOGY .....</b>	<b>27</b>
4.1	BACKGROUND ON CONTRACTING OPPORTUNITIES UNDER SUPERFUND.....	27
4.2	EMERGENCY RESPONSE TECHNICAL ASSISTANCE TEAM CONTRACT .....	28
4.3	UNITED STATES BUREAU OF RECLAMATION ENGINEERING AND CONSTRUCTION CONTRACTS.....	28
4.4	SITE-SPECIFIC REMOVAL AND REMEDIAL CONTRACTS .....	29
4.5	REMEDATION ACTIONS SUPPORT SERVICES.....	29
4.6	RESPONSE ENGINEERING AND ANALYTICAL CONTRACT .....	29
4.7	ENVIRONMENTAL SERVICES ASSISTANCE TEAMS CONTRACT.....	30
4.8	HAZARDOUS MATERIAL INCIDENT RESPONSE TRAINING CONTRACT .....	31
4.9	TECHNICAL SUPPORT FOR SUPERFUND POLICY FORMULATION .....	31
4.10	SUPPORT OF SUPERFUND IMPLEMENTATION EVALUATION .....	32
4.11	PAYMENT FOR SUPERFUND CLEANUP .....	32
<b>5</b>	<b>CONNECTION BETWEEN REMEDIATION CONTRACT AND REMEDIATION PLAN... ..</b>	<b>35</b>
5.1	THE GERMAN SOIL PROTECTION ACT .....	35
5.2	DECONTAMINATION PLAN .....	35
5.3	INVESTIGATION AND PLANNING FOR REMEDIATION .....	37
5.4	MONITORING .....	39
<b>6</b>	<b>SOIL PROTECTION IN GREECE.....</b>	<b>41</b>
6.1	SITUATION IN GREECE .....	41
6.1.1	<i>Remedial liability.....</i>	<i>42</i>
6.1.2	<i>Legislative framework relevant to soil remediation.....</i>	<i>43</i>
6.2	WASTE MANAGEMENT PLANNING.....	46
6.2.1	<i>Direct Implementation as a requirement on legislative provisions complementing an introduction of remediation contracting.....</i>	<i>47</i>
6.3	THE LAVRION CASE STUDY .....	48

<b>7 CONCLUSIONS .....</b>	<b>52</b>
<b>BIBLIOGRAPHY .....</b>	<b>55</b>





# **1 Concepts and definitions of terms**

## **1.1 Introduction**

Land is beyond any doubt part of the environment and deserves the law's attention and protection. However, land found protection in law only recently. This paper will explore the role of contracting for contaminated land remediation. Purpose of the Study is to present the importance of imposition of remediation measures for both environmental authorities and liable parties.

In a review of this length it is not possible to consider all aspects of rehabilitation legislation. In dealing with regulations concerning contaminated and polluted land, we have highlighted the content of these regulations without reference to the economic costs of the tasks required by them in various countries. Furthermore, a short insight of the substance of the contract is presented, as well as a variety of contracting typology.

During the analysis, the basic legal instruments on waste management and planning stage of waste management, in Greece is offered. Lastly, the basic legal instruments on the protection of the environment could be the introduction "door", with legislative intervention.

## **1.2 Conspectus of Legislation concerning Contaminated Sites and Its Implementation**

Contaminated land, like other pollution problems, is a legacy of industrialization which is regarded as a threat to society in the developed market economies, even though the threat is worse in the industrialized former eastern bloc and developing market econ-

omies. In the developing market economies, public and political attention has only recently begun to be turned to environmental issues, and they are not regarded as a priority.

On the other hand, in spite of public awareness and political commitment in North America and Western Europe, countries regulated the problem differently. The following account considers the practices in identification, clean-up, and financing of remedial action concerning contaminated land within the United States, Canada, the United Kingdom, The Netherlands and Germany. The respective standards, guidelines and legislative regulations are discussed; the similarities and differences are highlighted and practical experiences summarized.

### **1.2.1 Terminology**

Three terms are often used in the context of remediation - "contaminated land", "land affected by contamination" and "brownfield land". Arguably for the purposes of a remediation contract the terminology does not matter - there are some contaminants which are harming or could harm the environment and these need to be dealt with as part of the development. That said, the terms have different meanings and it is worth understanding how they fit together:

#### **Brownfield land**

*"The Brownfield Guide: A practitioner's guide to land reuse in England"* published in 2006 by English Partnerships states (page 9): "for the purpose of this guide, brownfield land refers to land and buildings where reuse may in some way be constrained by physical or regulatory issues that affect its potential for reuse. This includes land and buildings that are derelict and/or vacant and those that are occupied, in whole or part, but which have been identified as having redevelopment potential, though impacted by physical and/or regulatory constraints that hinder or prevent their reuse."

#### **Contaminated Land**

This expression derives from the legislative regime contained in Part IIA of the Environmental Protection Act (EPA) 1990 of the Parliament of the United Kingdom. The statutory definition is:

*“any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that-*

*(a) significant harm is being caused or there is a significant possibility of such harm being caused; or*

*(b) pollution of controlled waters is being, or is likely to be, caused”.*

Interpreting this definition requires the application of statutory and technical guidance and making technical judgments, for example a judgment as to whether a contaminant triggers “a significant possibility of significant harm” otherwise known as “SPOSH”.

### **Land affected by Contamination**

This is the expression used in the Planning Policy Statement 23: Planning and Pollution Control (PPS 23). Paragraph 2.13 of Annex 2 Development on Land Affected by Contamination to PPS 23 states:

*‘To avoid confusion with the statutory term “contaminated land” and its definition and to reflect the different context and scope of planning control, this Annex uses the wider term - “land affected by contamination”. This is intended to cover all cases where the actual or suspected presence of substances in, on or under the land may cause risks to people, property, human activities or the environment, regardless of whether or not the land meets the statutory definition in Part IIA.[1]*

### **1.2.2 Identification of Contaminated sites**

The contamination of land and ground water by chemicals has been well recognized and acted upon in Europe and North America. This has been a consequence of the identification of a large number of contaminated sites with the potential to affect the health of residents and other groups using those sites. This has led to the establishment of legislation concerning contaminated sites and to the implementation of remediation procedures. These measures have been in place for almost twenty years in these countries resulting in a great breadth and depth of experience in the management of contaminated land and water.

### **1.2.2.1 U.S.A.**

In the United States the two major legislative instruments dealing with contaminated land are the 1976 Resource Conservation and Recovery Act (RCRA) and the 1980 Comprehensive Environmental Response Compensation and Liability Act (CERCLA) including their amendments and reauthorization. The RCRA establishes a 'cradle-to grave' regulatory programme for current hazardous waste activities while CERCLA establishes a comprehensive response programme for past hazardous waste activities by providing funds and authority. Accordingly, national contingency plan (NCP) regulations are set in which owners and operators of any facility are required to notify the release of reportable quantities of hazardous substances and pollutants or contaminants to the national response centre of the Environmental Protection Agency (EPA) in Washington. There are more than 720 hazardous substances listed by the EPA as presenting a substantial danger to human health and the environment. In addition, according to CERCLA a 'pollutant or contaminant' can be any other substance not on the list of hazardous substances which 'will or may reasonably be anticipated to cause any type of adverse effects in organisms and/or their offspring'. The list of hazardous substances is regularly updated by the EPA and by the end of 1990 there were approximately 33000 sites in the EPA's inventory of potentially hazardous sites. Out of these, 31000 sites have undergone preliminary assessment by the EPA. As a result of preliminary assessment it was decided that 19000 sites would be handled by local government together with the parties potentially responsible and not by federal action, leaving 12000 sites on the National Contingency Plan (NCP).

### **1.2.2.2 United Kingdom**

In contrast, in the United Kingdom the existing laws including the Control of Pollution Act of 1974 (COPA) and the Environmental Protection Act 1990 (UK EPA) are not designed to investigate or identify contaminated land. Instead they aim to minimize pollution by controlling activities which have the potential to contaminate.

In addition they are designed to respond to specific contaminants in the case of redevelopment. There is no centrally managed identification of contaminated land except through pilot studies carried out in a few locations, including a comparatively detailed

study made in It is estimated that 100000 sites in the United Kingdom, covering more than 100000 hectares, are contaminated. The Environmental Protection Act 1990 requires local authorities to maintain a register of land exposed to contaminative use. The contaminative use list issued by the Department of the Environment covers a wide range of processes and operations. It includes processes for producing energy, chemicals and raw materials, operations such as the burial of diseased livestock, activities of research or educational laboratories, and dry cleaning services. As stipulated in the UK EPA the scheduled compilation of contaminated land registers should have commenced by April 1992 and should have been available to the public by April 1993.

The government has postponed the action after complaints by developers and land-owners that such registers could blight their property. It was also revealed that further consultations would take place but there is no target date for implementing the register. It is worth noting here that the register is still mainly intended for use in property transactions.

### **1.2.2.3 Canada**

In Canada the major piece of legislation that deals with contaminated land is the 1988 Canadian Environment Protection Act (CEPA). CEPA is a comprehensive act and has created the 'priority substance list'. Using data on priority substances, a list of 'hot spots' has been identified. The list of 'priority substances' is comparable to the United States' list of hazardous substances even though it is much shorter. The list comprises substances proved or suspected to have negative effects on human health and the environment." There is, however, no structured system, as in the United States, for identifying contaminated land at national level, even though CEPA and other laws and regulations require compulsory reporting of spills, pollution and emission of contaminant".

In contrast to the national situation in Canada, the city of Toronto has an inventory of contaminated land compiled from previous contaminative use and the province of Quebec has a list of companies whose operations are suspected of causing contamination.

#### **1.2.2.4 The Netherlands**

In The Netherlands the legislation dealing with the identification of contaminated land is contained in the 1983 Soil Clean-up Act (interim) referred to as IBS and the 1987 Soil Protection. The provincial authorities are responsible for investigation and clean-up. Although the national survey of contaminated land was started in 1980, since 1983 there has been an extensive programme to identify contaminated sites. The survey has helped in the production of lists of sites considered likely to be hazardous in the future to human health and the environment. According to the summary of various studies carried out by the national and provincial authorities, there are 650000 contaminated sites of varying size throughout the country. About 110000 are thought to be sufficiently contaminated to need remediation and of these 25000 were considered to need urgent action because they posed a serious threat to human health and the environment.

#### **1.2.2.5 Germany**

In Germany the sixteen states and the federal government have been working since the early **1970s** to abate the problem of contaminated land. The legal foundation of the contaminated land problem is contained in three federal acts and various state laws and regulations, the federal acts are: the 1972 Waste Disposal Act, the 1986 Waste Disposal Act and the 1974 Environmental Protection Act. These pieces of legislation have been criticized for containing no direct regulations on contaminated land. In spite of the lack of direct legal regulations an enormous amount of work has been undertaken towards tackling the problem of contaminated land. The responsibility of identification of contaminated land rests with state authorities and contaminated sites are considered as a historical burden. There is a similar approach in most states towards identification of contaminated land. The state of Hamburg follows three stages in the identification process: documentation and surveying, preliminary studies, and detailed studies. The first stage consists of gathering information from different sources regarding the suspected site. From the information gathered a 'contaminated site reference register' and accompanying site map is produced. These documents are used as support documents for any undertaking related to the use of the land. Accord-

ing to the state of Hamburg the sites are divided into four categories, A, B, C, and X, depending on the risk to human health and the environment. The state has adopted the United States Environment Protection Agency's hazard ranking system and the Dutch A, B, and C reference value to fit its needs. If the initial evaluation reveals a high risk a preliminary study is undertaken, followed by detailed studies which prepare an action plan for remediation.

### **1.2.3 Remediation liability**

#### **1.2.3.1 U.S.A.**

In the United States CERCLA has established a trust fund called 'Superfund' which is primarily drawn from tax on the petroleum and chemical industries. The maxim behind 'Superfund' is 'shovels first and lawyers later'. The EPA pays for the remediation from Superfund and whenever possible recovers the cost from responsible parties. CERCLA puts the liability for remedial action on potential responsible parties (PRPs). PRPs include past and present owners of the site and also persons who arranged for the transport, disposal and treatment of a contaminant. Once the PRPs are identified and an enforcement agreement is reached, PRPs are compelled to execute the remediation under the EPA directive. If agreement is not reached, in good time the EPA can order PRPs to take action towards remediation. If PRPs fail to comply with an enforcement order the EPA can undertake the remediation and recover the actual costs, plus three times the actual cost in damages. Remediation settlement figures showed that the financing by PRPs has increased drastically. It should also be noted that the liability costs also apply to the 'natural resources damage' even though such damage to the ecosystem is difficult to quantify. Natural resources include flora, fauna, groundwater, surface water, etc., which are managed by the federal or state governments.

#### **1.2.3.2 United Kingdom**

In the United Kingdom there is no legislation which particularly compels the remediation of contaminated land. Rather, it is dealt with as a condition of planning permis-

sion. Here the guiding principle is *'caveat emptor'*, consequently remediation costs are borne by those who own or purchase contaminated land with a view to redevelopment. The environmental lobbies have urged the adoption of the 'polluter pays principle' as in other countries but the concept has failed to be accepted by the law commission. The law commission insisted that the 'polluter pays principle' will invite more litigation; instead they recommended 'let the buyer be well informed'. This will leave in doubt the effectiveness of remedial action taken by developers using the existing undemanding guidelines of the Department of the Environment (DOE). Furthermore, the consequences to human health and the environment of leaving aside untreated contaminated sites for which there is no demand for development remain to be seen.

### **1.2.3.3 Canada**

In Canada, the six provinces and the six territories have laws which empower them to stop contaminative operations and undertake remediation at the polluter's expense. As in the United States, authorities can also order responsible parties to carry out remediation; if they fail to carry out the order the authorities can undertake the remediation and recover the cost and expenses. As an exception to the above, the province of Quebec places responsibility for remediation on the purchaser or developer of the contaminated site. The Canadian government's Green Plan published in 1990 mentions the allocation of a 250 million for remediation between 1992 and 1996. In addition to enforcement stipulated in the Canadian Environmental Protection Act (CEPA) of 1988, the federal government has promoted the 'life cycle' management of toxic substances which is planned to ease the burden on land and ultimately the contamination of the soil.

### **1.2.3.4 The Netherlands**

In The Netherlands the financing of remediation is laid down in the two acts of Soil Clean-up and Soil Protection. The main tenet is that the 'polluter pays principle' should be adhered to as far as is possible. Reasonable success has been recorded in the recovery of costs from those who are responsible for contamination. In the early 1980s clean-up was undertaken by provincial authorities and costs were covered from con-



tributions by local authorities within whose boundaries the site is located, and from national authorities. Local authorities pay a maximum of UK£50000 plus 10% of the remaining cost. The national authorities are authorized to recover the cost from the polluter. The objective of this proactive government involvement was to remediate, in the shortest possible time, those sites which posed a serious threat to human health and the environment. In the mid and late 1980s the involvement of responsible parties and developers also made some progress. This breakthrough gave an opportunity to the government authorities to concentrate on and tackle the more urgent and serious sites that are threats to human health and the environment. Developers are also obliged to investigate the site before they commence any construction work and if they find the site is contaminated they are authorized to take remedial action and recover the cost from the previous operator or owner of the site. If the remedial cost is found to be beyond the developer's resources, and provided the project is in the public's interest, the government will make available the resources necessary to carry out the remediation. Nowadays the government adheres more and more to the 'polluter pays principle' as the number of sites discovered has increased and a huge amount of money is required for remediation. Above all it is now realized that remediation will not be completed in a short time span but will take considerably longer and should be planned for accordingly.

#### **1.2.3.5 Germany**

In Germany remedial costs are covered by the state budget, by a reclamation fund and by responsible parties. Although the 'polluter pays principle' is the guiding regulation it is not always applicable for several reasons, Many previous polluters are unknown as contamination may have originated in the late 19th century, the time at which the chemical and other industries started. Even if the polluters are located, most cannot afford the cost or they are protected by other laws dealing with special production. They may also have been responsible for plant operation during and after wars, when emergency situations led to improper disposal practices.[2]





## 2 Advantages of Remediation

### 2.1 Important as preconception: administrative discretion in determining the person in charge of remediation

Remediation is usually considered to be an entirely positive step, freeing up land for redevelopment with the advantages of reducing pressure on greenfield sites and possibly improving the area within which the site is located.

#### 2.1.1 Imposition of remediation measures

Remediation measures on a site, especially in cases of historical pollution, may entail quite considerable costs and deplete the entire value of the property concerned. In the event that the existence of harmful alterations of the soil or inherited pollution has been confirmed by investigation or was obvious from the start, the competent authority may ask the individuals in charge to carry out

- decontamination of the soil, i.e. measures for eliminating or reducing pollutants of the soil if necessary, to the extent that this has been affected
- investigation measures which the competent authority shall not carry out itself within the framework of official investigation or
- other measures to which the competent authority may oblige the persons in charge of remediation, as
  - measures which prevent, or reduce, a dissemination of pollutants in the long term without eliminating the pollutants (safeguarding measures).
  - measures for eliminating or reducing harmful alterations of the physical, chemical, or biological condition of the soil.

## **2.2 The specific advantages of a remediation contract**

It enables the formulation of implementation of the obligation to restore depending on the capabilities of the debtor which, combined with the fact that that the debtor has engaged in conventional configuration, allows speculation that will perform well (in that it will prompt the usual case, moreover, the data of the exact determination of the extent of the obligation and the consequent certainty of abstinence of government from adopting further measures, if the contract fulfilment is good).

This enhances the effective implementation and law, as it would normally avoid the disputes that are common in case of unilateral intervention by the government through administrative notices remedies, which are affected by the parties addressed the measures and may significantly delay the imposition of measures when combined with demands to suspend the execution of these transactions.

The above point is of particular importance in cases where the administration - probably due to the specific nature of the occasion of historic pollution -wants to achieve soon the result, but the legal and / or actual situation concerning the status as a debtor or the extent of recovery is not clear-cut, and any clarification would require considerable time.

Often It's not entirely clear that the purpose of the Act by taking measures restorer has been achieved due to the fact that the denaturation of the risk assessment referred to historically contaminated property to specific demands such measures may have significant difficulties with their cause and the characteristic that the theme of restoring historically contaminated properties have more scope sciences. This is because the de-

tails of the transfer of the purpose of recovery from a legal perspective on reality will depend on several factors (eg soil composition, use).

It allows scaled or graduated remediation contract in the cases determined that residual soil contamination cannot (over) exceed some values of pollutants targeted by the restoration, in case of a breach would be an increase of the agreed limit during the pre-agreed rate, so that the debtor should maintain the price level of pollutants below the second (re-delimited upward price).

In this way, more levels of performance of rehabilitation can be agreed according to the schedule to the point to be considered fulfilment of the obligation even when (eventually) that has not reached the final stage of the value that should at a given time, probably because the contractual obligation was excessive for the debtor (provided of course that will provide suitable conventional control options that will ensure that the debtor has tried by all means which may be required by him within the limits of the principle of proportionality below the limit values of pollution after the restoration has been).

### **2.2.1 Use in practice**

Unfortunately the public authorities still have reservations about contractual regulation in spite of the advantages for both sides specified above. They still only make relatively infrequent use of the instrument of the administrative law contract. They prefer to use their authorisation to issue unilaterally binding regulations by administrative acts.

The reasons for this are

- familiarity with the classical administrative act and above all
- a lack of experience with the negotiation and conclusion of remediation contracts; in addition, there is the fear of surrendering sovereign rights and the incurrance of obligations. From the point of view of the public authority, the contractual relationship frequently appears to be connected with the surrender of the apparently comfortable relationship of superiority and inferiority.

Despite all that, the advantages are clear for both sides.

### **2.2.2 For public (environmental) authorities**

The public authorities mainly

- benefit from a reduction in their workload and other relief, as well as
- a better reputation because of evidence of their willingness and capacity to cooperate
- the contract may also enable them to enforce accompanying claims that could not be enforced by an administrative act, e.g. performance bonds.

### **2.2.3 For the (supposed as) liable parties**

The party responsible for cleaning up residual pollution can secure considerable advantages from contractual regulation. There may

- be an improvement in the market ability of the real estate or the removal of marketing obstacles, as well as
- an increase in security regarding investment and reserves.
- It is possible in this way to influence the public authorities' use of margins of assessment and discretion, achieve an exemption or the waiver of subsequent demands.





# 3 Contents and Conduct remediation

## 3.1 Scope and Level of Remediation

The terms scope and level of remediation are often incompletely understood by the contracting parties because of inexperience in remediation contracting. Foresight in identifying potential problems is crucial in drafting the scope description; otherwise, the scope and level of remediation contract terms may prove to be insufficient to deal with future complications.

Several major concerns bear on the drafting of the scope and level of remediation terms in a remediation contract. First, while a remediation contract focuses on a specific site for cleanup, the project is often inextricably linked with contamination on adjacent sites. Furthermore, the technology used in remediation often has an impact on the environment. These potential effects must be addressed when describing the scope of the project and work to be performed. Second, as remediation technologies improve and achievable remediation and detection levels change, the required level of remediation may also change. Therefore, the contract must carefully describe the exact level of remediation agreed upon, and whether contingencies will be made for changing the level to accommodate enhanced technology or changes in government standards. Third, the scope and level of remediation are affected by the technology available, and the feasible types of technology will vary as to cost, time for completion, and other factors. The parties should understand and contemplate these variations and agree upon the technology most in line with their needs.

Problems in defining the scope and level of remediation are best addressed through examination of the remediation process in different contexts, as illustrated in following

sections. USA examples are selected, while among the E.U. mostly in Germany seem to have institutional consolidation and scope.

## **3.2 Remediation Scope Concerns in Soil Remediation Contracts**

The identification of contamination in properties adjacent to the contracted site is of primary concern in soil remediation contracts. When contracting for the remediation of one parcel, the parties need to anticipate the effects on or from surrounding parcels, as well as the effect that the remediation process may have on the environment in general. For example, if the contract focuses solely on the treatment of the contaminants on one site, without regard to the impact and possible contribution to contamination via the plume extension from or to adjacent properties, the contract may prove to be inadequate. By failing to address such potential effects, the contract will not adequately describe the scope of the work.

The remediation contract also needs to consider the potential impact of the chosen remediation technology on the air. In areas such as Southern California, where governmental authorities routinely require air permits in connection with almost any remediation process, this is a topic that must be included in the scope of the work. Air permitting concerns are particularly crucial when the parties agree to treat the contaminated soil via an air stripping technique. This type of technology is apt to have more impact on the air and trigger stiffer air permitting requirements than other types. Thus, when defining the scope and level of remediation, the parties must allocate the responsibility for dealing with air permitting and the potential adverse impact of a chosen technology on air quality.

In certain circumstances, a potentially responsible party (PRP) may be faced with an order to take corrective action beyond a property line. In both federal and state statutes, provisions exist to mandate corrective action beyond hazardous waste facility boundaries (as defined in those statutes) "where necessary to protect human health and the environment unless it is demonstrated to the satisfaction of the Administrator

that, despite [the PRP's] best efforts, [the PRP] was unable to obtain the necessary permission to undertake such action."

The parties (especially the contractor) must have a feel for the mechanics of ground-water hydrology (movement of water beneath the ground surfaces). They must also be aware of the factors governing the migration of water and bulk contaminants within the soil. Suffice it to say that no environmental cleanup takes place in a vacuum.

If a site lies in a large industrial complex or an area where many industrial and commercial activities have taken place on contiguous sites, the parties should attempt to determine whether the adjacent sites are contaminated. This determination can be made via the environmental assessment process. With the cooperation of the adjacent landowners, the contracting parties may perform environmental testing to determine if hazardous materials are present. If the property owners are not cooperative, the parties should at least perform a Phase I audit. This involves a review of title records for past owners and lienholders and an observation of the property to determine the possibility and likelihood of contamination.

If testing confirms the contamination or likelihood of contamination of contiguous properties, the contract must address the potential contribution of that contamination to the specific property under contract. If owners of contiguous property will not contribute to the cost of cleanup, the owner could seek to force such contribution through legal action. However, such action will only hamper completion of the work. To expedite matters, the owner could employ construction techniques. In one case, for example, the owners agreed to additional construction to seal off the treated site from the contaminated adjacent properties by use of a slurry wall. In another case, gas chromatography was employed to distinguish the owner's contaminant from that of the adjacent property. When the vapor extraction system (VES) began to pull out the contiguous contaminant, the amounts were recorded and used in the damage claim. In the meantime, the project went forward.

Regardless of how the parties agree to handle the potential contamination from contiguous parcels, they must recognize that they may incur added expense. Anticipating and contracting for this possible contamination may be a point of hot negotiation, but failure to deal with the issue could be disastrous, as in the following illustration.

In a recent California dispute, the remediation contractor used the VES technology to treat a property in a large industrial site near downtown Los Angeles. The site was surrounded by parcels containing an ancient blacksmith shop, a paint shop, and an auto body repair shop. Initial studies of the site led the contractor to conclude that approximately six months of pumping would be sufficient to adequately treat the volume of soils involved. The contracting parties, however, never investigated the contiguous sites for possible contamination. At the end of six months the contractor was still pumping at the same rate with no end in sight. Test wells of the perimeter of the site made it immediately clear that the contractor was treating the plume from adjacent properties.

In this situation, a Phase I review of the ownership histories and business records of those contiguous properties would have immediately revealed the possibility of contamination from the adjacent sites. The parties could then have contracted for an equitable method of dealing with the situation. Alternatively, the owner could have sought contributions from the contiguous property owners toward the cost of the remediation process. Perhaps the parties would have decided that, because of the contamination from the neighboring parcels, remediation to the desired level was impossible. In any event, the problem could have been addressed up front. Instead, the failure to address the issue led to a dispute between the owner and the contractor. The problem was further complicated by the fact that the owner had been given a lump sum price for the remediation, based on the contractor's initial estimate. From the contractor's point of view, it may be desirable to obtain a warranty from the client concerning possible migration of contaminants. It could be written thus:

Client is unaware that any previous owner of adjacent (contiguous) property has engaged in or permitted any operations upon that property in any way involving any hazardous materials, nor have any hazardous materials migrated or appeared likely to migrate from adjacent (contiguous) properties to the site of the Project.

This warranty could be modified by allowing the client to except out such items as are set forth in an attached exhibit. The warranty presupposes that the contract has carefully defined "hazardous materials" and "the site." The impact of contiguous properties must also be considered in determining the scope. If work must be performed on

those properties, whether or not they contribute to the contamination, the parties must consider the possibility and potential cost of acquiring such easements.

### **3.3 Remediation Level Concerns in Soil Remediation Contracts**

Like the scope of remediation, the level of remediation must be carefully considered. As technology and expertise in the environmental remediation field improve, the attainable level of decontamination also improves. Moreover, an acceptable level of remediation for an owner may not be acceptable for the permitting agencies with oversight control of the remediation process, or for the lender on the property who has liability concerns. Thus, the remediation contract is deficient if it fails to address the level of remediation desired by the owner as well as that required by the permitting agency and the lender.

### **3.4 Drafting the Scope and Level of Remediation Contract Terms**

The scope and level of remediation are, first of all, functions of the location of the properties involved in relation to other potentially contaminated properties, the nature of the contaminants involved, and the type of technology to be implemented. For a large-scale project located near potentially contaminated properties, greater specificity must obviously go into the writing of the terms. The parties should also consult with local, state, and federal authorities, as well as real property lenders, for their acceptable levels of remediation. Finally, site location must be considered. Remote properties often are amenable to more primitive treatment methods and require less pristine results than projects in populous areas. With these guidelines in mind, the parties should agree on whether their goal is to meet the regulatory or lender level, or if they have some other goal in mind.[2]

Before defining the scope of remediation, the owner and contractor must identify the presence and magnitude of potential contamination from or to adjacent properties. The owner and contractor would be advised to determine the scope of their work after an environmental assessment of such properties is performed.

In agreeing on the level of remediation, consultation with local, state, and federal authorities as well as lenders will quickly indicate what the contractually mandated minimum level must be. This consultation is important to avoid ambiguity in setting the level. The parties should also allow for changes in those standards. Sample language could read: "Remediation to level X or to the level acceptable to XYZ agency or lender as of (a set date)."

After performing the appropriate assessments of contiguous parcels, and investigating regulatory and lender standards for an acceptable remediation level, the parties will be in a better position to select the appropriate technology. They must weigh the benefits and drawbacks of the available technologies based on the scope and level of remediation and any peculiarities of the site. For instance, excavation means greater cost and liability exposure related to the transportation and storage of the extracted hazardous materials. If the parties use this technology, they must take into account the potential financial impact of hiring RCRA-permitted transporters (for a review of permitting under the Resource Conservation and Recovery Act. On the other hand, the basic pump-and-treat technology, although less complex than extraction, often proves inadequate in achieving the desired level of remediation. Similarly, VES is less disruptive than extraction, but may also be ineffective. Bioremediation, while cheaper, is often slower and less effective for certain contaminants. An excellent summary of some of these issues also appears in an article entitled "Science for Superfund Lawyers.

In line with the above statements following terms can be concluded in a remediation contract shown below.

### **3.5 Introduction**

*The Enterprise is developing the real estate ..... ("Operations Site"). The Enterprise intends to build office and residential buildings. The upward revaluation of the operations site to an office and residential location will be worked out together with the City of ..... by means of structural planning, which has already been passed. Applications have already been submitted for relevant preliminary building permissions for two partial areas; construction work is set to commence at short notice.*

By way of preparation for the construction project, the Enterprise has itself called in experts to investigate if, where and to what extent soil and/or ground water contamination are present on the operations site. In the course of this, locally restricted pollution with harmful substances was discovered, in respect of which remediation is necessary. The results of the investigation were continued as a register in several reports, and were submitted to the Authority and the Environment Office and the Water Resources Board; without accepting a legal duty to do so, the Enterprise has declared itself willing to develop a remediation concept and to carry out locally restricted remediation operations.

The Enterprise has moreover already commenced remediation measures in agreement with the Environmental Office, the Water Resources Board and the Authority. The present stage reached is evident from the expert assessment of risk of that is attached to this Contract. The assessment of risk contains a list of those plots of land in the Land Register sense and those media (soil, soil air, ground water) for which the need for remediation must be considered. The Enterprise shall continue the assessment of risk as a register, and shall inform the Authority by the regular submission of reports. The assessment of risk in particular contains a list of the plots of land in the Land Register sense and the media (soil, soil air, ground water) that need remediation.[...]

### **3.6 Aims of Remediation, Remediation Concept**

The parties agree that the aims of remediation on the operations site are not solely orientated towards the type and concentration of the harmful substances discovered; rather, the aims of the remediation and of clean-up are also to be laid down in a location-related and use-related way, taking into consideration the principle of proportionality.

The aim of the remediation is to ensure that the operations site can be used in the future within the framework of the lasting protection of the bases of life as an office and residential location without danger to human life and health, or to the environment. Any existing dangers to the ground water must be warded off.

Taking into consideration the principle of proportionality, a part of the remediation work shall be carried out in the course of the forthcoming construction of the building project.

### **3.7 Implementation of Remediation**

The Enterprise undertakes to carry out the remediation work specified in the Remediation Plan, taking into consideration the remediation aims.

Remediation shall be carried out by the Enterprise at its own expense and under its own direction, i.e. in particular with an expert commissioned by it, in agreement with the Authority and its specialist authorities.

The course of the remediation will be monitored in accordance with the Remediation Plan [In the case of extensive clean-ups of inherited pollution a remediation plan will be coordinated with the competent authority]. If the results of the monitoring permit the presumption that the remediation aims will be achieved, the expert commissioned by the Enterprise will - in agreement with the Authority - take a final sample in accordance with the terms of the Remediation Plan with the aim of confirming that the remediation aims have been achieved.

The remediation shall be considered complete if, at the time of taking the test sample, the desired remediation values as specified in this Contract are no longer exceeded in the contamination zones (see Remediation Plan) during an observation period of....

The remediation shall be carried out within the following periods:

- The work to be carried out in the course of the forthcoming construction work: within one year after the commencement of construction on the relevant building site;
- The remaining remediation work: within one year after the conclusion of this Contract, in so far as long-term time-limits have not been agreed under the terms of the Remediation Plan by reason of the type of certain work.

If, contrary to expectations, the remediation is not concluded within the specified periods or the periods agreed upon, or should it transpire that the selected remediation procedure is not



sufficient to achieve the remediation aims, the parties will - by way of supplement to this Contract - agree on if and how the remediation work is to be continued, within six months.

If the remediation should become delayed because acts of participation on the part of an Authority or its specialist authorities cannot be obtained, in spite of sufficient efforts being made by the Enterprise, the Enterprise cannot be accused of failing to observe the time-limits laid down.

### **3.8 Confirmation of Remediation**

At the given time, the Authority shall lay down in a legally binding way, and shall confirm for each individual plot of land (separately at the request of the Enterprise), that the remediation of the relevant land is completed, and that the public law duties of the Enterprise and the owner of the land that affect the long-term protection of the bases of life and the removal of risk on the relevant plot of land associated with the contamination are fulfilled.

However, contamination that only arises after the conclusion of this Contract is not encompassed by the declaration and confirmation.

The burden of proof for the success of the remediation on the relevant land shall be borne by the Enterprise. As soon as the success of the remediation on land declared to harbour residual pollution is proven, the public authority will in addition cancel the declaration of residual pollution for this land without undue delay.

### **3.9 Measures by Regulatory Authorities**

If the work agreed upon is not carried out within the time-limits laid down, and the Authority has twice issued a written warning to no avail, the Authority will regulate the warding off of danger, if necessary, on the basis of the relevant public law provisions. For the remainder, the contractual provisions shall remain unaltered.

### **3.10 Miscellaneous**

The parties shall co-operate in the implementation of this Contract in an atmosphere of trust. The co-operation shall in particular be characterised by endeavours to seek mutually agreed solutions to any existing difficulties, or to problems that arise in the future.

If a provision of this Contract is or becomes invalid, this shall not affect the validity of the remaining provisions. In this case, the parties will replace the invalid provision without undue delay, substituting it by a provision that comes as close as possible to the invalid provision both in legal and economic terms. The same shall apply if there is a gap in the Contract.

Alterations and additions to this Contract must be in writing. This requirement of written form may itself only be dispensed with in writing.

The Enterprise submits itself to immediate execution under the terms of the Administrative Procedure Act by the Authority in the case where, in spite of two written warnings by the Authority, the obligations specified in this Contract have still not been fulfilled, or mutually agreed work or decisions is/are not implemented as was agreed, and two written warnings were also issued by the Authority to no avail.

# 4 Contract typology

## 4.1 Background on Contracting Opportunities under Superfund

The Environmental Protection (EPA) published a document in April 1989, revised in September 1990, entitled Superfund: Getting into the Act, Contracting and Subcontracting Opportunities in the Superfund Program. The publication and its revisions provide descriptions of Superfund contract and subcontract opportunities. They also list some of the current contracts outstanding under Superfund, along with some contacts for contracting possibilities.

However, in August 1990, the Office of Emergency and Remedial Response (OERR) concluded a study that greatly affected the EPA's contracting method, as explained in Getting into the Act. The study included a broad analysis of the Superfund program's dependence on contractor support and recommended some changes, based on three principles:

1. The need for integrated, one-program approach to enforcement and clean up
2. The enhancement of competition through reduction of contract size: creation of greater opportunities for small businesses
3. A need for greater flexibility and oversight through decentralization program responsibilities.

As a result of the study, the OERR recommended the Long-term Contracting Strategy for Superfund [hereinafter Long-term Contracting Strategy], which was approved by the EPA. The OERR intended the Strategy to be a road map for the next decade, but also planned to continually reevaluate the strategy in light of changes to Superfund. Following approval in September 1990, the EPA has been phasing in the new contracting structures as the original contracts expire. Many of contracting and subcontracting op-

portunities are available under Superfund, and descriptions of these opportunities following.

## **4.2 Emergency Response Technical Assistance Team Contract**

A type of contracting and subcontracting opportunity available in preremedial work and removal actions is the Emergency Response Technical Assistance Team (TAT) contract. The EPA originally created TAT contracts to provide their regional offices with technical assistance in removal actions. TAT contracts were also used in correction actions under the Underground Storage Tank (UST) Trust Fund and in the oil spill prevention program under the Clean Water Act (CWA).

The EPA originally established TAT offices for each of the EPA regional offices, for the Environmental Response Team in Edison, New Jersey, and for the EPA headquarters in Washington, D.C. Each TAT, consisting of 11 to 45 people,

## **4.3 United States Bureau of Reclamation Engineering and Construction Contracts**

The Bureau of Reclamation assists the EPA in remedial planning, remedial design, and remedial action through the use of Interagency Agreements. Assistance is either provided in-house by Bureau of Reclamation personnel, or the Bureau contracts out the work.

The Bureau seeks contractors by advertising in the *Commerce Business Daily*. Any architect/engineering (A/E) firm may apply by completing the Architect Engineer and Related Services Questionnaire, standard forms 254 and 255. The Bureau makes its selection through a competitive bidding process, with the award going to the lowest responsive and responsible bidder. The Superfund work is handled through six regional offices: Boise, Sacramento, Boulder City, Salt Lake City, Billings, and Denver.

## **4.4 Site-Specific Removal and Remedial Contracts**

Occasionally, the EPA has solicited bids from contractors for a specific removal. For a site-specific removal or remediation contract, the EPA will usually list the opportunity in the *Commerce Business Daily*, and all interested contractors will submit a proposal and bid. Because of the tediousness of this method, however, the EPA has moved toward a system of established bidding pools for site-specific contracts. Under this system, known as the Pre- Qualified Offerors Procurement Strategy (PQOPS), two to three times a year, contractors submit to the bidding pools their qualifications in using specific technologies. Then, when either a removal or remedial site-specific contract is under consideration, any contractor within the appropriate pool may submit a bid.

## **4.5 Remediation Actions Support Services**

Remediation-type contracting work is not limited to removal and remedial actions under Superfund. The federal government has a demand for other support services related to the hazardous waste cleanup process. For example, the federal government needs support services for activities such as hazardous sample analysis, and for response and safety training of government officials in dealing with hazardous wastes.

## **4.6 Response Engineering and Analytical Contract**

The Response Engineering and Analytical Contract (REAC) contractor provides techniques and technologies for the remediation of hazardous waste sites and spills. The REAC supports the EPA's Environmental Response Team (ERT) under the authority of CERCLA/SARA, RCRA, the Toxic Substances Control Act (TSCA), CWA, and other acts.

The REAC contractor conducts field investigations of various studies and issues reports on the results. These studies include multimedia extent of contamination, bioassessment, treatability, contaminant transport, engineering/ feasibility, and risk assess-

ment. The purpose of these studies is to assist the ERT in providing support to EPA regional OSCs in removal actions and Remedial Project Managers (RPMs) in remedial actions.

The REAC contractor also performs evaluation and engineering design studies of commercially available technologies. The REAC studies the technology with the objective of confirming and documenting the technology's feasibility. Again, the ERT utilizes this information to aid the regional OSCs and RPMs in choosing or proceeding with their chosen technologies for treating the contaminated site.

Finally, the REAC contractor provides analytical services to the regional OSCs and RPMs. Such services include on-site and mobile laboratory capabilities. For example, the REAC contractor conducts rapid analyses of complex waste mixtures and environmental samples. In addition, the REAC contractor develops analytical methods for on-site and field laboratory equipment

## **4.7 Environmental Services Assistance teams Contract**

The Environmental Services Assistance Teams (ESAT) contract is another vehicle for providing support to the Superfund sites. Although the EPA formed the ESATs primarily to support Superfund projects, ESATs also support the RCRA program and other non-Superfund analytical efforts.

The ESAT contractors mainly provide multidisciplinary technical assistance. The EPA directs each ESAT in specific work assignments to perform analytical and technical tasks for regions within a designated zone of responsibility. Task areas include hazardous waste chemical analysis, review and validation of CLP data, review of site-specific quality assurance, site investigation and sampling plans, support in developing new analytical methods, and logistical and administrative functions.

The Long-term Contracting Strategy recommends maintaining the ESAT contracts; however, it calls for further decentralization of the ESAT functions. Therefore, the ESAT functions will be regionally-based. The EPA expects that decentralization will lead to greater competition and opportunities for small business participation, and flexibility

in responding to specific regional needs. Both contracting and subcontracting opportunities thus remain available for ESAT contracts, although in some regions the teams consist only of subcontractors.

## **4.8 Hazardous Material Incident Response Training Contract**

The EPA provides response and safety training for federal, state, and local government groups through its Hazardous Material Incident Response Training (HMIRT) contracts. The EPA, working through ERT and the efforts of HMIRT, provides a wide range of training to 5,000 students per year at 200 presentations of 15 different courses. The course material is adapted to the students' particular needs.

## **4.9 Technical Support for Superfund Policy Formulation**

The first type of contract opportunity available under the policy, program management, and administrative aspects of Superfund is the Technical Support for Superfund Policy Formulation. This type of contract provides assistance to the OERR in formulating, implementing, and assessing the effectiveness of Superfund programs.

The technical support contracts involve various aspects of the Superfund process, including engineering, public health, economics, and statistical concerns. The OERR requires the contractor to prepare a written analysis of technical issues involved in the aspect of Superfund addressed by the contract. In addition, the contractor must provide technical information and expertise in implementing the policies developed to deal with these technical issues.

## **4.10 Support of Superfund Implementation Evaluation**

The second type of contract opportunity available under the policy, program management, and administrative aspects of Superfund is the Support of Superfund Implementation and Evaluation. This contract is similar to the technical support contract in that it provides support in planning, implementation, and evaluation of the Superfund program. Unlike the technical support contract, however, this contract provides a wide range of other support services unrelated to technical issues.

This support contract provides personnel, services, and materials to the OERR. The contract provides support in many areas, ranging from removal and remediation work to financial management. Examples of services are removal response, remedial response, training, community relations, financial management, development of ADP systems, and special studies for program management.

## **4.11 Payment for Superfund Cleanup**

After the EPA places a site on the NPL for cleanup, it must determine the financial backing for the work. The EPA proceeds with either an enforcement-lead or a fund-lead cleanup.

### **– Enforcement-Lead Cleanup**

In order to proceed with an enforcement-lead cleanup, the government must be able to identify a sufficient number of financially viable PRPs. Furthermore, the environmental conditions at the site must not require an immediate response, to allow time for negotiation or litigation. The EPA has identified four classes of PRPs:

1. The current owner or operator of the site
2. The owner or operator at the time of disposal of any hazardous substance
3. Any person who arranged to dispose of or treat hazardous substances at any vessel or facility owned by another person containing such hazardous substances



4. Any person who accepted any hazardous substances for transport to sites selected by such person.

PRPs are responsible for all removal or remedial costs, including indirect, allocable costs, any other necessary response costs incurred by any other EPA- designated person, damages to or loss of natural resources including an assessment of the damage or loss, and the cost of any health assessment or health effects study carried out.

If the PRPs recognize that they face significant exposure to liability, they may organize themselves in order to negotiate with the EPA. Resolution of the EPA claim against the PRPs entails the creation of a consent decree, which must be blessed by the court in which the action is pending. The consent decree is often the product of extensive negotiation between the EPA and the PRPs and is inextricably linked to the remediation contract. Because the EPA has recently put forth its proposed standard consent decree, it is reasonable to expect that the agency will become increasingly involved in remediation contractor selection and contract negotiations.

- Fund-Lead Cleanup

In a fund-lead cleanup, the EPA cleans up the site itself with Superfund resources. The EPA usually decides to pay itself either because there are few, if to protect the public welfare or the environment. After the EPA completed the work, it will sue any PRPs it can identify. In the fund-lead cleanup, the consent decree does not play a role, because the EPA does all of the cleanup work itself. [2]



# 5 Connection between Remediation Contract and Remediation Plan

## 5.1 The German Soil Protection Act

Germany's political structure as a federal state, legislative competencies are divided between the Federal authorities and the Federal states (Länder) in different ways. In the field of environmental legislation, this also holds for the media soil and water.

Soil is regulated by the Federal Soil Protection Act, which entered into force in 1999. The Act and the corresponding ordinance, the Federal Soil Protection and Contaminated Sites Ordinance, cover both preventive soil protection and post-contamination soil protection and, hence, also the treatment of contaminated sites.

With the introduction of the Federal Soil Protection Act and the corresponding ordinance on Federal Soil Protection and Contaminated Sites in 1998 respectively 1999 the cornerstone for a federal-unique soil protection was laid and benchmarks were set-up for the harmonization of existing provisions of national and environmental law, to bring soil into focus. The scope of the soil protection law is to maintain soil functions in a sustainable way or to restore them

## 5.2 Decontamination plan

A decontamination plan should be requested in the case of particularly complicated or dangerous historically contaminated land. These form the basis for the decision on which measures and what level of measures are necessary to clear up the old contaminants.

The material requirements made for the clearing up of old contaminants correspond to the requirements regarding damaging changes rendered to the soil. Thus, there is no difference for contaminants. In particular the Federal Soil Protection Act provides additional regulations for the clearing up of old contaminants because of the special potential danger represented by old contaminants.

Identifying old contaminants and land suspected of harbouring old contaminants remains the responsibility of the Lander, even after the Federal Soil Protection Act entered into force. As the majority of the Federal Lander had already provided for a register of old contaminants, there has - in view to its subsidiary character (cf. § 3 of the SPA) - been no necessity to deal with it in the SPA. As a rule these registers contain information on the location, magnitude and condition of the land suspected of harbouring old contaminants, the former enterprise there and the facilities which have been closed down, the type, quantity and nature of the waste and substances which may be present or which may have been used; their effect on the environment and the dangers which emanate from land suspected of harbouring old contaminants; earlier, existing and planned usage of land suspected of harbouring old contaminants; present and future owners and parties entitled to use the land; and other substance matters and legal relations of importance for the investigation and prevention of dangers and for determining the parties obliged to maintain proper conditions .

These registers are continuously updated. The information from the registers on old contaminants is passed on to the authorities who require these to perform their statutorily stipulated tasks. Upon request, information can also be issued to the owner and/or person entitled to use the land. Third parties, on the other hand, must demonstrate a legitimate interest in order to obtain information from the registers.

Under § 12 of the SPA, the parties involved must be notified. Before old contaminants are investigated and before decontamination is undertaken, the parties obliged to provide information must notify the owners of the respective property, the other

parties entitled to use the property and the neighbors affected about the measure they plan to carry out. To provide this information, the documents which are important for the evaluation of the measure must be made available for perusal. If the documents contain confidential business or operating information, their content must still be provided in enough detail to allow the parties affected to be able to assess the effects of the measures on their interests as long as this is possible without divulging confidential business information.[10]

### **5.3 Investigation and Planning for Remediation**

Under § 13, section 1, subsection 1 of the SPA, decontamination investigations and a decontamination plan should be requested in the case of particularly complicated or dangerous old contaminants. These form the basis for the decision on which measures and what level of measures are necessary to clear up the old contaminants<sup>40</sup>.

The stipulations of § 13, section 1, of the SPA go considerably beyond § 9 of the SPA, which merely allows the authorities to determine whether a damaging change has been rendered to the condition of the soil or whether old contaminants are present at all and which dangers emanate from such old contaminants. At the same time, § 10, section 1, of the SPA could allow decontamination investigations to be ordered. The authority would have to decide on such measures in accordance with its obligatory discretion. § 13, section 1, of the SPA even assumes a restricted discretion ('should request...'). In the case of particularly complicated or particularly dangerous contaminants, the authority may refrain from ordering a decontamination investigation and decontamination planning. But that is only justifiable and permitted because the exceptional conditions prevailing in an individual case.

The information on the past, present and future use of the property to be subjected to decontamination, an assessment of the danger and the decontamination investigations must be summarized in a decontamination plan. Furthermore, a decontamination plan must depict the decontamination objective and contain a list of the decon-

tamination, safeguarding, protective, restrictive and self-monitoring measures along with a time schedule for the execution of these measures (§13, section 1, subsection 1, clauses 1 to 3, of the SPA). Details on the content and scope of decontamination are set out in the Soil Protection and Old Contaminants Ordinance. A decontamination plan under § 13 of the SPA will always set out the result of a multi-stage planning process and ultimately offer the basis for orders by the authorities to subject old contaminants to decontamination. The licenses then required in connection with the decontamination must be obtained on the basis of a decontamination plan, e.g., a licence for a soil-treatment facility under the law, controlling emissions. Decontamination plans have already proved their effectiveness in the past.

§ 13, section 6, of the SPA provides for a binding declaration pursuant to the decontamination plan. The responsible authority (i.e. in principle the local district can declare a decontamination plan as binding, change such a plan or attach subsidiary stipulations to it in this context. A plan declared binding by an administrative act (generally includes decisions made by the authorities which are required for the decontamination and which are issued in consultation with the relevant authorities and listed in the plan declared to be binding. This could include, for instance, waste, water or emissions-control licenses or permits. Licensing decisions for plans which are subject to environmental safety tests according to the Environmental Impact Assessment Act are not covered by a declaration of a binding nature.

In connection with § 13, section 6, of the SPA it is not clear whether the declaration of the binding nature of the decontamination plan merely replaces the previous decontamination order or whether - proceeding beyond this - it must also conclusively stipulate the legal relations of the parties not obliged to carry out the decontamination, i.e. the parties which may be affected by the decontamination. The fact that the Federal Soil Protection Act, with the exception of giving them the right to information, does not provide for any involvement of parties affected by the decontamination in the procedure for the declaration of a binding nature or in the design of the decontamination investigation or decontamination planning suggests that the binding nature should not be extended. The declaration of a binding nature for this reason probably does not affect the rights of third parties. As administrative acts can be legally challenged only by

persons who are individually affected, the fact that the decontamination plan is declared binding by such an administrative act, does not lead to the possibility of third parties challenging it.

The decontamination plan can be implemented either via orders issued by the authorities, by the declaration of a binding nature or by a decontamination contract. § 13, section 4, of the SPA provides for a decontamination contract to be submitted along with a decontamination plan. The draft contract may also include third parties (e.g. neighbours or other owners of the property). The purpose of this arrangement is to allow the parties obliged to effect the decontamination to develop their own conception of the decontamination which corresponds to their capabilities. The authority only has to make sure that the requirements set out in § 4, section 3, of the SPA are complied with.[13]

## **5.4 Monitoring**

§ 15, section 1, subsection 1, of the SPA lays monitoring obligations on the relevant authorities for old contaminants and land suspected of harbouring old contaminants. Monitoring ranges over all the statutory requirements and requirements set out in detail in the statutory ordinances. With regard to old locations of enterprises and old contaminant storage sites, § 15, section 1, subsection 2, of the SPA clearly stipulates that licensing decisions given by the authorities as well as orders issued by the authorities to amend licensing decisions remain in effect and are not affected by the Federal Soil Protection Act.

Under § 15, section 2, of the SPA, a party obliged to subject old contaminants to decontamination may also be required during the period following the execution of the decontamination, to allow safeguarding and restrictive measures or to carry out self-monitoring measures. This in particular involves the investigation of the soil and groundwater. The results of the self-monitoring measures are to be recorded and kept for five years. The parties obliged to carry out self-monitoring measures under § 15,

section 3, of the SPA are obliged to inform the responsible authority as to the results of the self-monitoring measures upon request. The authorities, for their part, must also keep these records for five years.

The authority with local jurisdiction is in charge of the monitoring and enforcement of statutory obligations and administrative law orders. This authority may have recourse to certain instruments to enforce obligations. The authorities may use coercive means, such as substitution, fines and direct intervention. Substitution consists of a coercive measure which can be used if an action which should have been performed by another party has not been performed. In such a case the authority with the right of enforcement can undertake the action itself and impose the costs on the party that was legally obliged to carry out the action. As obligations to effect decontamination as a rule constitute obligations to take action which does not necessarily have to be carried out by particular persons, substitution is a suitable measure of administrative coercion if old contaminants have to be cleared up. In addition there is the possibility of forcing the party under obligation to undertake the measure required by threatening and imposing fines.

Finally, the authority may resort to direct intervention, whereby the party obliged to undertake the required measure may be subject to force or the authority can undertake the action itself. There is much to suggest that fines and substitute performance are generally used when an order for decontamination is not complied with. Administrative intervention is not suited to replace complicated obligations on owners to take action, but rather to situations in which the required objective must be achieved with simple, rapid measures.[5]



# 6 Soil protection in Greece

## 6.1 Situation in Greece

There is neither reference to any soil remediation contracts/agreements in the Greek soil protection regime nor any specified references regarding the appropriateness of such contractual commitments between liable persons and environmental authorities. Remediation contracts could formerly only be concluded on the basis of (general or specific) statutory provisions. This is valid, since the elements necessary for a contract to be termed 'administrative' in the Greek theory and the Council state case law are, cumulatively, the following:

- (a) At least one of the contracting parties is a public legal person, more particularly the State or a Local Government Agency or a public legal person governed in principle by administrative law;
- (b) The object of the contract has to do with the operation of a public service in a functional sense or serve a public purpose determined by the relevant provision;
- (c) The conclusion and performance of the contract are governed, at least in part, by norms of administrative law, or the contract contains terms which give the contracting public legal persons powers of unilateral intervention in the contractual relations, and consequently create for it an exceptional contractual position. Last prerequisite is to be fulfilled in the case of a remediation contract (Spiliotopoulos, Greek Administrative Law, Athens 2003, marginal no 186)

Such authorizations are not available, so that the administrative act remains the regulative instrument even in cases in which the facts correspond to the main application field of a remediation contract concept.

### **6.1.1 Remedial liability**

A general liability framework for operators is foreseen in Presidential Decree No. 148/2009 which transposed Directive 2004/35 on environmental liability into domestic law. Pursuant to this they have the duty to adopt and apply the preventive and remedial measures against environmental damage or direct threat thereof and to carry the relevant costs, regardless of the amount, should they be held liable for the relevant damage.

The operators underlie two more duties towards the competent authorities. On one hand, they have the duty to inform them immediately about the existence of environmental damage or direct threat thereof. On the other hand, they are obliged to cooperate with the competent authority on the determination and implementation of the remedial measures. With reference to prevention of environmental damage the operator has a duty to take the necessary measures and inform the competent authorities. The operator has further the duty to comply with the remedial actions or plans set out in accordance with the relevant procedure stated above.

The costs of the preventive and remedial measures are separately regulated. As a general rule the operator bears them. The competent authority recovers via security or other financial guarantees from the operator, who has caused the damage or the direct threat thereof, the costs it has incurred in relation to the preventive or remedial actions taken under this legislation.

The exceptions from the polluter-pays principle foreseen in the ELD are included in the Presidential Decree as well. The competent authority may not recover the costs, in the cases when the expenditure required to do so would be greater than the recoverable sum or when the liable operator cannot be identified.

With reference to the person liable for the preventive and remedial actions the Greek legislator has implemented the polluter pays principle foreseen in the ELD, in a pure form. No provision for landowner or land occupier liability is provided, as the case is in Germany and in United Kingdom. The result is that, while in Germany and in United Kingdom a line of usual suspects exist, such as the operator, the owner, the occupier, the state or even the previous owner or the shareholders of a company, in Greece the

number of potential offenders restricts in just two; the operator and the state. There is nothing against the number but rather the problem is that of the appropriate addressee of the administrative measures, in the meaning of it possessing the necessary resources for the costs of preventive and remedial measures. The Greek legislator unfortunately still refrains from adopting a stance on it.[17]

### **6.1.2 Legislative framework relevant to soil remediation**

The basic legal instruments on waste management in Greece are the following:

#### **6.1.2.1 Law 1650/1986**

Except for the above provision, there is not any other – at least - systematic legislation referring explicitly to soil protection. Any regulations, also relevant to possibilities of integration of, are to be sought in several waste management statutes .

#### **6.1.2.2 JMD No 114218/1997**

JMD No 114218/1997 refers on establishment of a framework of technical specifications and of general plans of solid waste management.

#### **6.1.2.3 JMD No 29407/3508/2002**

Joint Ministerial Decision No 29407/3508/2002 on sanitary landfill of waste, transposing Council Directive 99/31 on landfill of waste. The Decision, among others, sets strict operational guidelines for Sanitary Landfill Sites; mandatory processing of waste both at a national and at Landfill Site level, establishes targets for reducing the amount of waste deposited by landfill and provides for planning and licensing. The main elements introduced with the J.M.D. - aiming at promoting the construction of high standard landfills which will gradually be turned into residue landfills - are:

- Obligation to treat waste before landfilled,
- Stricter operational rules for sanitary landfills
- Introduction of changes regarding gate fee for landfilling,
- Requirements for the landfill operating authorities where established

- Certain changes on planning and permitting procedure
- Inclusion of gate fee, costs of financial security, final closure and after-care provisions.

Moreover, the JMD requires that the costs for operation and extension works of landfills is covered by the price charged by the Waste Management Authorities (via Municipalities) for the disposal of waste.

#### **6.1.2.4 JMD No 50910/2727/2003**

Joint Ministerial Decision No 50910/2727/2003 on the management of waste which transposes the Directive 1999/31/EC into national law and includes the National Waste Management Plan introduces the tool of Regional (and Inter-regional) Waste Management Plan as the operational tool for waste management planning, determines the obligations of the management authorities and the Regions, regulates the permits of waste management operators and sets a time limit for the eradication of uncontrolled dumping.

The above mentioned JMD adopts en masse as legally binding principles in relation to waste management all principles of European waste management[?] Law and technical- managerial principles. This is to be interpreted rather as a genuine effort to improve and upgrade the legal framework on waste management in Greece.

#### **6.1.2.5 JMD No 13588/725/2006**

J.M.D. 13588/725/2006 «On measures, terms and restrictions concerning hazardous waste management», sets out among others, the obligations of all operators involved in the management of hazardous waste and includes provisions for pollution prevention and remediation and contaminated sites due to improper management of hazardous wastes.

According to this statute, every producer of hazardous waste must keep records with data and submit annual report to the competent regional authority, as well as to the competent authority for granting the environmental permit.

According to Art 2 Definition 17 "Remediation and / or rehabilitation of a facility or an area" means all studies and projects which ensure that the facility or site, with

the intended use will be contaminated by hazardous waste or the existing use is already polluted from hazardous waste, no longer poses a risk to public health and the environment.

Art 9 refers to Permanent closure of facilities or sites for hazardous waste management. The managing body of hazardous waste after the closure of the facility and / or disposal site or use is required before final closure of (the) pursuant to paragraph (3) to consolidate and restore the site in accordance with the specific conditions and restrictions provided in the decision approving the environmental conditions.

Article 12. Within one (1) year after the entry into force of this Decision, the manager of hazardous waste must submit to that specific department remediation study - rehabilitation of premises or facilities. The managing body or the holder of hazardous waste in accordance with paragraph 1 of this Article pays the costs for implementation of those projects and tasks.

#### **6.1.2.6 JMD No 24944/1159/2006**

JMD No 24944/1159/2006 concerning the establishment of general technical specifications of hazardous waste management. The standard forms of both the before mentioned records and annual report are set in J.M.D 24944/2006. Hazardous waste should be properly UN classified, packaged and labeled according to the respective international and community standards of waste transport

Article 3 Chapter 7(7.1.5) of JMD No 24944/1159/2006-refers to monitoring of environmental quality. After recovery operations - restoring polluted area and to demonstrate the effectiveness of such methods is necessary to monitor the quality of environmental media and parameters that were affected or who may be affected by the above operations.

Therefore in this chapter shall be recorded all necessary measures, actions and interventions to monitor the quality of environmental media and parameters and the period of monitoring.

#### **6.1.2.7 JMD No 8668/2007**

JMD No 8668/2007 on the approval of Hazardous Waste National Planning.

Regarding hazardous waste, by the Ministerial Decision 8668/2007 the National Plan for the Management of Hazardous Waste is approved. Article 4 refers in Rehabilitation and or consolidation of sites implementation measures of the National Planning and restoration of hazardous waste management spaces.

## **6.2 Waste management planning**

One of the major achievements of the reform of waste management law in Greece in 2003 is the clarification, simplification and rationalization of the planning stage of waste management.

Planning operates at two levels.

- Firstly, the National Waste Management Plan, so as to incorporate the major principles, goals, policies and actions for the rational management of urban wastes, according to the community legal framework and arising national obligations, annexed to the 2003 Joint Ministerial Decision, which sets out the general priorities in relation to waste management.

- The operational plan, as the executive action plan in the area of solid waste management, with specifications and goals in consistency with those of the National Planning, however, is set at the regional level, as a specification of the general directions of the National Plan and an instrument to identify priorities and measures to be taken.

- There is also a provision for inter-regional plans, if the competent regions decide on this option.

Moreover, J.M.D. 50910 sets the targets for diversion of biowaste, in accordance with the Council Directive 1999/31/EC of 26 April 1999.

In principle, the responsibility and liability in terms of waste management activity in Greece is at local government level and lies within the competence of the Municipalities (Art 9).

In terms of waste management law, Municipalities are named "Waste Management Authorities" (WMA). They are responsible for the collection, transport, temporary storage, reload, recovery and disposal of waste.

In principle, the law treats waste management as a public service, although it also recognises the shortcomings of a totally public-centered approach in practice, especially in relation to collection and transport, and therefore provides for the private sector to be active, in particular, as

(a) subcontractors of the WMA and/ or,

(b) in order to fulfill the duties of the holders of waste, excluding the holders of household waste, when the WMA is unable to provide collection and transport services for them ("waste managers"). [19]

### **6.2.1 Direct Implementation as a requirement on legislative provisions complementing an introduction of remediation contracting**

To avoid the disadvantage of the contract that is not a title that runs without a court order, as opposed to unilateral administrative act imposes remedies on the debtor and develops enforceability (enforceable nature of the administrative act), the legislature could introduce the possibility, in proportion to the German rules (§ 61 section 1 of the Administrative Procedure Act), membership of parties to directly run without a dispute in connection with the contents of the contract, (regulation to enable direct implementation of the contract) (see Pape/Schillhorn, 171).[5]

In the German case, the authority with local jurisdiction is in charge of the monitoring and enforcement of statutory obligations and administrative law orders. This authority may have recourse to certain instruments to enforce obligations. The authorities may use coercive means, such as substitution, fines and direct intervention. Substitution consists of a coercive measure which can be used if an action which should have been performed by another party has not been performed. In such a case the authority with the right of enforcement can undertake the action itself and impose the costs on the party that was legally obliged to carry out the action. As obligations to effect decontamination as a rule constitute obligations to take action which does not necessarily have to be carried out by particular persons, substitution is a suitable measure of administrative coercion if old contaminants have to be cleared up. In addition there is the possibility of forcing the party under obligation to undertake the measure required by threatening and imposing fines.

Finally, the authority may resort to direct intervention, whereby the party obliged to undertake the required measure may be subject to force or the authority can undertake the action itself. There is much to suggest that fines and substitute performance are generally used when an order for decontamination is not complied with. Administrative intervention is not suited to replace complicated obligations on owners to take action, but rather to situations in which the required objective must be achieved with simple, rapid measures.

### **6.3 The Lavrion Case Study**

“In Greece there is no official or systematic collection of information and data on contaminated land. Part of this information is currently scattered among various public and private organizations and establishments.

Brownfield redevelopment strategies in Greece are under development. Although there is no national plan for brownfield redevelopment, there are relevant programs, supported by the Ministry of Environment and concerning the area of Lavrion in Attica,



the “Thriassion Pedion” in Attica, and the industrial area in the Assopos river valley (Viotia).

Lavrio Technological and Cultural Park is one of the most important projects related to brownfields regeneration in Greece. The site under consideration is located in Lavrio, within the metropolitan area of Athens and consists of an area of 245,000 m<sup>2</sup>. It has a long history as an ancient silver mine, dating back to the 5<sup>th</sup> century B.C., while in recent history it operated as a metallurgical facility which, at the time, was the most important industry in Greece. The site played a key role in Greek history and culture, as an important contributor to economic and cultural development as well as a cradle of technological innovations (Karachaliou & Kaliampakos, 2005).

The environmental site assessment showed that due to the industrial activity, which ceased in the early 90’s, a severe environmental problem was left behind. The soil was characterized as unusually heavy contaminated, exceeding the commonly applied thresholds by several orders of magnitude.

In 2005, the European Union and the Greek State approved a remediation project for the site. The selection of the remedial action was based on specific criteria, such as elimination of the risk to human health and the ecosystem, technical feasibility and suitability, cost-effectiveness in the short and in the long term, etc. Given that soil clean-up by means of treatment technologies (e.g. chemical extraction and soil washing, immobilization, soil handling, etc.) was prohibitively expensive, the remediation project provided for the excavation, transportation and disposal of contaminated soils at an on-site repository using the “dry-tomb” method (Kaliampakos et al., 2007).

#### **6.3.1.1 The Remediation Plan**

The target of the restoration plan was to practically eliminate human health risks and to minimize environmental threats, as much as possible, over the entire area of concern with regard to a strict restoration budget of 3.5 million Euros. Considering the available funds, the application of treatment technologies or encapsulation techniques over the entire area would be completely prohibitive given that the contaminated land covered an area of about 80,000 m<sup>2</sup>. The alternative of capping of contaminated soils,

although affordable was also rejected as it would be only a short-term solution and would not sufficiently prevent the spread of contamination due to the infiltration of rainwater or the contact with shallow groundwater.

In order to achieve the remediation targets within the available funds a special application of the “dry tomb” was implemented. The plan provided for the excavation, transfer and disposal of the contaminated soil at a repository, especially designed for that use within the boundaries of the site. In other words the method was practiced ex situ but on site. The technique ensured the secure deposition of the contaminated soil into a water-tight construction while the excavated areas were also backfilled with clean soil (Kaliampakos et al., 2007).

The repository covers an area of 18,500 m<sup>2</sup> and has a capacity of 113,000 m<sup>3</sup>. The design of the repository was based on detailed analyses with respect to stability hazards, leachate production, expected stormwater runoff and erosion phenomena, etc. Special attention was given to the lining system that was designed according to European standards specified in the Council Directive 1999/31/EC for hazardous waste landfill. The main steps of the “dry tomb” construction in Lavrion were the preparation of the area in which the landfill would be placed, the construction of the base of the landfill, the transportation and placing of the contaminated soils, the construction of the upper part of the landfill, the construction of stormwater system and the installation of monitoring system. In order to ensure the safety of the people residing in the vicinity of the site an integrated environmental monitoring system was designed. The necessary equipment was installed prior to the beginning of the works and monitored air quality, surface water and ground water quality, leachate and subsidence phenomena during the construction and after the completion of restoration works.[18]



# 7 Conclusions

The responsibility for residual pollution and the obligation to remove it may be regulated by an administrative law contract, in which the responsible party and the public authority agree on the concept, the aims of the contract, the allocation of costs, etc. A remediation contract, mainly in use in the U.S.A. and Germany, should usually accompany a remediation plan relating to the implementation of the latter, and can provide for the involvement of third parties.

The advantages of the remediation contract are clear for both sides. The public authorities mainly benefit from a reduction in their workload and other relief, as well as a better reputation because of evidence of their willingness and capacity to cooperate. The contract may also enable them to enforce accompanying claims that could not be enforced by an administrative act, e.g. performance bonds. Meanwhile, the (supposed) party responsible for cleaning up residual pollution can secure considerable advantages from contractual regulation.

The contract must carefully describe the exact level of remediation agreed upon, and whether contingencies will be made for changing the level to accommodate enhanced technology or changes in government standards. The scope and level of remediation are, first of all, functions of the location of the properties involved in relation to other potentially contaminated properties, the nature of the contaminants involved, and the type of technology to be implemented. Different types of contracting structures cover the range of different cases.

A decontamination plan should be requested in the case of particularly complicated or dangerous historically contaminated land. These form the basis for the decision on which measures and what level of measures are necessary to clear up the contaminated land.

In Greece, remediation contracts are an absolute innovation in theory and praxis. There is neither reference to any soil remediation contracts/agreements in the Greek soil protection regime nor any specified references regarding the appropriateness of such contractual commitments between liable persons and environmental authorities. The basic legal instruments on the protection of the environment could be the introduction "door", with legislative intervention since training and enforcement of administrative contract should be regulated by applicable law.



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