

# Contaminated Sites and Public Policies in São Paulo State, Brazil

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## 1. Introduction

The existence of contaminated sites is an environmental issue that has been increasingly detected by environmental authorities in Brazil, most specifically in the State of São Paulo. The state government is in charge of the environmental management of contaminated sites through its environmental agency, the Environmental Company of the State of São Paulo [CETESB]<sup>1</sup>. Since the beginning of the 90's the agency carries out the systematic management of these sites.

The environmental agency has pursued its own structuring to meet this growing demand, enabling its effective action and finding solutions for this serious environmental problem. Thus, since the beginning of the nineties, due to the German expertise and know-how regarding this subject, a technical cooperation was established with the German government, through its Technical Cooperation Society (Deutsche Gesellschaft für Technische Zusammenarbeit, GTZ), which encompasses both technical and financial support. This cooperation allowed the development of a specific project in order to build the capacity of the state agency for the management of contaminated sites (CETESB, 2011a).

The origin of contaminated sites is related to a lack of knowledge, back in time, about safe procedures for the handling of hazardous substances, to the disrespect of such procedures and to accidents or spillings during the development of production processes, transportation or storage of raw materials and products (CETESB, 2011b).

According to CETESB (2011a) "the soil and underground water contamination have been the focus of great concern for the last three decades in the industrialized countries, mainly in the USA and Europe. This environmental problem becomes more serious in urban industrial centres such as the Metropolitan Region of São Paulo".

The State of São Paulo has 3.675 contaminated confirmed sites (CETESB, 2011b). This inventory has been published since the year of 2002.

Table 1 shows the distribution of contaminated sites registered in São Paulo by region and activity, regarding the last data published by CETESB on December 2010.

Cunha (1997) considers that it is the inactive industries which more critically affect the environment and the population, among the contaminating sources in total.

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<sup>1</sup> CETESB is the institution that by law is in charge, among other assignments, of enforcing administrative policies for environmental issues throughout the entire State of São Paulo, as established by Laws no. 118/73 and no. 997/76.

In addition, according to Sánchez (2001), it is possible to relate this issue to the life cycle of factories that had their doors shut for various motives: either because they had lost economic competitiveness or because their location became less advantageous. This means that there is the need for modernization and re-use, including potential interim uses up to the point of a potential industrial or other re-use. Cases such as these are part of urban dynamics and deserve special attention. Nowadays those are one of the main urban conflicts to be solved in cities worldwide.

Region	Activities					
	Commercial	Industrial	Residues	Gas Stations	Accidents	Total
São Paulo	39	114	28	1.004	5	1.190
São Paulo Metropolitan Region - others	29	125	20	419	6	599
Country Side	60	158	40	1.105	12	1.375
Coastal Area	15	40	21	223	1	300
Paraíba Valey	4	34	1	171	1	211
Total	147	471	110	2.922	25	3.675

Table 1. Contaminated sites in São Paulo State, Brazil – December 2010

The existence of a contaminated site becomes the generator of many problems, such as the threat to superficial and underground water sources, the devaluation of properties, besides the threats to public health.

Brazil does not have yet a national public policy, approved by law, about contaminated sites or brownfield redevelopment<sup>2</sup>. Therefore many contaminated sites have been reused for new commercial or housing purposes without any type of control from municipal public authorities – potentially ticking time bombs, entailing possibly serious health and environmental risks in the near future.

As the appearance of contaminated sites is daily increasing, being a considerable problem mainly in the industrial cities, the State of São Paulo, breaking new ground, has approved on July 2009 a public policy, by which main regulatory aspects and legal framework on the issue are established, setting the tone for new legislation on this matter by the other states of the Brazilian Union.

<sup>2</sup> From the conceptual point of view, it is important to highlight that the term “Brownfield” corresponds to a site degraded by previous use, which was abandoned or is under-utilized. It may or may not have real or perceptive contamination problems. Most are located in urbanized areas and require some type of intervention for a potential re-use as defined in the “Sustainable Brownfield Regeneration: CABERNET Network Report” (CABERNET, 2006, p. 26). Up until now the term “Brownfield” has not been translated into Portuguese. Sánchez (2001, p. 29) suggests the translation into Portuguese as “dysfunctional real estate/property”, for there is no possibility that the sites hold a new function without some type of treatment. Thus, the contaminated site (degraded site by contamination) is a type of Brownfield as described above.

A National Environmental Council Resolution has also been approved, on a federal basis, establishing guidelines values for soil and underground water, as well as environmental directions for contamination management.

The objective of this paper is to comment the management of contaminated sites carried out by the State of São Paulo and to present its new legislation.

## **2. Methodology**

The information and data collection methods combined literature and documental research. The literature research included bibliographies on contaminated sites management. The documental research included basically official documents published by CETESB, some federal legislation and the new legislation on contaminated sites management approved by the State of São Paulo (Act n. 13.577, of July 8th 2009). Given the newness of the law, there is no literature about it.

## **3. Results and discussion**

### **3.1 Environmental competences as determined by the constitution**

The Brazilian Federal Constitution establishes that "the protection of the environment and fighting pollution in any of its forms" is a common competence of the Union, the States, the Federal District and the Municipalities, according to article 24, I and IV.

The competence to legislate upon the natural resources and soil protection, environment protection and pollution control is concurrent to the Union, the States and the Federal District, according to article 24, VI.

With regard to Municipalities, the Brazilian Federal Constitution attributes competences to "legislate on matters of local interest", "complementation of federal and state laws, when applicable", and "promotion, when applicable, of adequate territorial order, through planning and control of urban land use, parceling and occupation", amongst others (art. 30, paragraphs I, II and VIII respectively).

Although the environmental quality of urban sites depends on State control, the municipalities also have the duty to enforce this control, since their attribution to manage the use and occupation of the land is established by the Constitution.

### **3.2 Commentaries on the act n 13.577/2009 of the State of Sao Paulo**

Even before the approval of the 2009 State Act CETESB had already developed specific procedures to manage contaminated sites based on "Executive Acts" n. 007 and n. 023 initially approved on the year 2000.

On the year 2007 those statutes were revised and updated on a new Executive Act n. 103, which foresees a methodology to manage such sites aiming at their rehabilitation for future use, legal responsibilities for the contaminated site management, technical studies to be made in order to identify and delimit the contamination, emergency actions to be undertaken, remediation techniques, institutional and engineering control measures, monitoring deadlines and communication procedures towards governmental entities (such as the state health department and the municipalities, amongst others).

The State Act is composed of 6 chapters: i) general provisions (including the object, objectives, technical definitions and measures), ii) soil contamination prevention and

control, iii) contaminated site (divided in responsibilities, identification and remediation), iv) economical tools, v) infractions and penalties and vi) general provisions.

The object is to protect the soil integrity against harmful contamination alterations, to establish liabilities, identify, register and remediate the contaminated sites in a way to make it safe for present and future use.

As a general objective, it was established the sustainable soil use clause, protecting it from contaminations and preventing alterations on its natural features and functions by means of:

- i. preventive measures, including the protection of soil and underground water natural properties;
- ii. corrective measures including procedures for contaminated sites identification, protection of the health and safety of the population exposed to the contamination; remediation
- iii. incentive measures for the reuse of remediated sites;
- iv. promotion of exchange programs among institutions;
- v. guarantee to information and to participation by the population affected by decisions related with the contaminated areas.

### 3.2.1 Definitions and tools

As a mainly technical environmental statute, a whole section has being dedicated to the definition of mostly important terms for the soil quality management. Throughout this essay some technical and legal definitions shall be presented.

A number of tools have been determined for the soil quality protection and contaminated sites management, among some of those that follow below:

#### a) Contaminated sites registration

The database will be composed by detailed information about: i) potentially pollutant activities and enterprises; ii) which, in the past, had promoted activities liable to provoke soil contamination; iii) which are under contamination suspicion iv) any other applicable cases; and will be published in the State of São Paulo Official Gazette and on the State of São Paulo Environment Department website.

As mentioned the environmental agency of São Paulo is already keeping a database of contaminated and rehabilitated areas which has been published in its website since 2002.

#### b) Licenses and enforcement

The licensing and the enforcement activities are important tools both in regards to the preventive and the corrective aspects in the management of contaminated sites.

Environmental licensing is the administrative procedure under which the environmental agency licenses the location, installation, enlargement and operations of undertakings and activities using environmental resources, which are considered effectively or potentially pollutant, or those which, under whatever way, may cause environmental degradation (CONAMA<sup>3</sup>, 1997).

The procedure is divided into 3 phases, under which the following documents are issued:

- i. Preliminary License (granted in the undertaking's planning phase, approving its location, conception and environmental viability);

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<sup>3</sup> National Environmental Council

- ii. License for Installation (authorizes the undertaking's installation according to the preliminarily approved specifications); and
- iii. License for Operations (authorizes the undertaking's operation, after checking the compliance to previous licenses).

In the State of São Paulo the pollution sources, which depend on environmental licensing, are provided for in the Decree no. 8468/76.

In the process of licensing an industry one should check if the activities performed may contaminate the soil or underground waters. Considering that the great majority of pollution sources depend on the license to operate, the occurrence of contaminated sites may be avoided in advance by including the suitable technical requirements in the undertaking's installation or operation license, such as for example the obligation for adequate disposal of chemicals stored or of waste generated in the production process. Otherwise, from the correction stand point, it is possible that the undertaking's operation license renewal be linked to the identification or remediation actions.

#### c) Deactivation Plan

The Act establishes that the entities legally responsible for undertakings, which are subject to environmental licensing and potential contamination generators, about to be totally or partially deactivated or disoccupied, must communicate the suspension or closing of activities to the competent state agency.

At this moment a Deactivation Plan should be presented, contemplating the existing environmental condition, especially regarding the existence of contamination, and should contain, when applicable, information about the remediation measures to be taken.

Sánchez (2005) highlights the deactivation planning importance. Shutting down is a stage of the industrial activities cycle of life in which the environmental damages accumulated throughout the previous enterprise stages should be repaired, to avoid conveying the reparation cost to either third parties or society.

Since year 2002, in the State of São Paulo, the obligation to present a deactivation plan for the termination of activities subject to environmental licensing is already in force (according to Decree n. 47.400/2002).

#### d) City master plan and land use and occupation legislation

This provision is timely to reinforce the need for municipalities to effectively take part in the prevention and management of contaminated sites.

Municipalities have a power-duty to act in the management of contaminated sites under two aspects: i) they hold the common competence with the Union, States and Federal District to protect the environment and fight pollution (since contamination, from the legal stand point, is a type of pollution), and ii) they hold the competence to legislate on matters of local interest and to promote territorial ordering through the planning and control of urban land use.

The Master Plan is the basic instrument for urban development policies. The Act acknowledged the importance of the municipal action in the prevention and management of contaminated sites and has often summoned the municipality to take on its responsibility.

The Master Plans and the legislation regarding land use and occupation should take into account the sites either potentially contaminated or under the suspicion of contamination, and the confirmed contaminated sites. The approval of land parceling and construction projects should guarantee the safe use of such sites.

Vis-à-vis the express determinations provided for in the Act, in practice, municipalities of the State of São Paulo should organize themselves administratively to tackle this issue by creating specific statutes and administrative procedures, providing equipment and technical capacity building of human resources, etc. In addition they are responsible for the land use restriction, in case the contaminated site poses health risks, so to avoid the receptors exposure to the existent contaminants.

During the different phases of the contaminated sites management the local governments should be notified by the competent environmental agency when, e.g., the area is classified as contaminated under investigation, contaminated or remediated for the declared use (art. 18, clause II; art. 24, clause IV; and art. 27, clause III, respectively).

It is therefore not enough that local governments be notified about the presence of contaminated sites, they should know what to do with this information. Questions such as – “What should be done about a contaminated site?” “What are the consequences for urban planning in the presence of contaminated sites?” “Is there a risk to the extent that the land use should be restricted?” “How to restrict the land use?” “Which planning instruments can be created to attract investors to a contaminated site?” – need still to be discussed.

Lazanha (2005) highlights that “the Municipality, as a federative entity holding the competence of territorial ordering, should be held accountable for corrective and pro-active measures in these sites, thus avoiding the spreading of further damages to society with the construction of housing and other buildings in contaminated sites” (p. 116).

In this context, Marker (2003) highlights the importance of assessing – within the Brazilian context – which are the pre-requisites to “identify and mark the degraded sites in master plans and land use, to make diagnoses and develop strategies for their revitalization” (p.40). In São Paulo, despite the action of the state agency, there is urgent need to involve the municipalities on this issue. At the municipal level, however, there are neither instruments nor any kind of action to enforce the intervention on contaminated sites. In the State of São Paulo an exception is the municipality of São Paulo where urban planning provides the control of contaminated sites.

e) “Bank collaterals” and “environmental insurance”

Such tools, which still need to be regulated, were provided to ensure the fulfillment of the remediation plan and should reach the minimum value of 125% of the Plan’s estimated cost. In case of non-compliance there is a provision for the possibility that the environmental agency execute the collaterals aiming at covering the remediation measures complementary costs.

f) Quality criteria for soil and underground waters

In regards to the control of air and superficial waters pollution, the environmental legislation established standards of emission and quality, while the soil quality control is conducted through the use of “guideline values”.

“The adoption of guideline value lists has been the usual practice in countries with a tradition in soil and underground waters quality monitoring and in contaminated sites’ control” (CETESB, 2001, p. 10). “In a distinct manner there is no standardized international approach – regarding soil pollution – because of its complex and variable nature, and the soil is a privately owned economic asset” (CETESB, 2001, p.14).

These “guideline values” are determining tools for the soil and underground waters quality management, since they are the fundamentals for making important decisions both

preventive, and of pollution control in sites under the suspicion of contamination, as well as corrective, since they are indispensable for the area to be considered contaminated legally. This will eventually deploy a series of actions from the legally responsible agency and the Public Power.

After specific studies which took into account the natural quality of the State of São Paulo soil, in 2001, CETESB published the "Report for the establishment of Guideline Values for Soils and Underground Waters in the State of São Paulo". This report shows the approach of the USA, Germany and Holland in regards to the subject and it also reports the methodology adopted by the State of São Paulo for the establishment of its own values. The values published in 2001 were revised and nowadays those approved by the CETESB Executive Act n. 195/2005/E are ruling.

#### g) Fund

As it occurs in countries such as the USA, a specific Fund for contaminated sites can be used in cases where the site is considered "orphan", i.e., where the responsible entity is not identified or localized.

The Act provided for the creation of the State Fund for the Prevention and Remediation of Contaminated Sites, which is an investment fund linked to the Environment Department of the State of São Paulo and aimed at soil protection and contaminated sites' identification and remediation.

Different sources of revenue were considered, among which resources resulting from international aid and cooperation and from intergovernmental agreements; donations; environmental compensations resulting from potentially contaminating activities; 30% of the amount collected with fines applied based on the Act; reimbursement of State expenditures, etc.

#### h) Environmental compensation

The environmental compensation was regulated by the State of Sao Paulo Decree no. 54.544/2009. In the environmental licensing of enterprises, potentially generating contaminated sites (to be defined by an executive act of the Environment Secretary), the entrepreneur will collect a value - to be determined by the competent agency - as a means of compensation to the Fund.

### **3.2.2 Legally responsible entities for the identification and remediation of contaminated sites**

The Act established the following subjects as legally, and solidarily, responsible for the prevention, identification and remediation of a contaminated site: the one that caused the contamination and its successors; the owner of the area; the "the holder of the right of surface use"<sup>4</sup>, the holder of the actual possession; whoever benefits directly or indirectly from it.

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<sup>4</sup> The Act defines "the holder of the right of surface use" as the "holder of the right to the surface of a land lot, for a determined or undetermined period of time, through a public deed registered in the Property Registry Office, in the terms of the Federal Law no. 10257, July 9<sup>th</sup>, 2001. According to this law of 2001 (named Statute of the City, that establishes the general guidelines of the urban policy) the right to the surface encompasses the right to use the ground, the underground or the land related aerial space, in the form established in the respective contract, meeting the urbanistic legislation (paragraph 1<sup>st</sup> of art. 21).

Solidarity is a legal concept provided for in the civil law<sup>5</sup>, and in the case of contaminated sites it is possible to demand total obligation (e.g. of remediation) from all the responsible listed above.

The responsibility of the contaminated site's owner is transmitted to the next owner in the case, e.g., of the sale of the contaminated land. The jurisprudence related to the matter has been understanding that a real estate environmental obligation (e.g. that of maintaining the green areas and the permanent preservation areas) is transmitted to the new acquirer.

It is worth mentioning a recent decision held by the Brazilian Superior Court of Justice on an appeal reported by Justice Herman Benjamin: "the obligations derived from the illegal dumping of waste or residues on the land are of *propter rem* nature, meaning that they adhere to the title and are transferred to the future owner (...) regardless any discussion about the good or bad faith of the acquirer, for one is not in the condition of subjective responsibility based on the establishment of a personal guilt"<sup>6</sup>.

### 3.2.3 Contaminated sites preventive actions

As a general rule the Act provided that any individual or legal entity that may contaminate the soil should adopt the measures for not to allow the occurrence of changes that are significant and damaging to the functions of the soil.

The functions of the soil were listed as: 1- sustainability of the life and "habitat" for humans, animals, plants and soil organisms; 2 - maintenance of the water cycle and its nutrients; 3 - protection of underground water; 4 - maintenance of the historical, natural and cultural heritage; 5 - conservation of the reserves of minerals and raw-materials; 6 - food production; 7 - means for the maintenance of social-economic activity.

Environmental agencies were then obliged to act preventively and correctively with the purpose of preventing significant changes in the functions of the soil. As a parameter for actions, the use of the following guideline values (already cited above) was provided for:

- quality reference value is the "concentration of a determined substance in the soil and in the underground water that defines a soil as clean, or the natural quality of underground water". These are to be used to guide the soil functions prevention and control policy.
- prevention value is the "concentration of a determined substance above which harmful changes to the quality of soil and underground water may occur." They shall be used to discipline the introduction of substances in the soil. In case they are surpassed there will be the need of monitoring resulting impacts.
- intervention value is the "concentration of a determined substance in the soil and in the underground water, above which there are potential direct and indirect risks to human health, considering a generic exposure scenario". These will be used to stop the continuous introduction of polluting loads in the soil.

### 3.2.4 Identification of contaminated sites

In the initial phase of contaminated sites identification, two concepts are important: i) "contamination potential area": area, land, location, facility, construction or improvement

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<sup>5</sup> Article 264 of the Civil Code (Law no. 10.406/2002) establishes that "there is solidarity when in the same obligation more than one creditor or more than one debtor concur, each one with the right, or obliged to the whole debt".

<sup>6</sup> RESP n. 650.728 - SC



where activities, are or were developed and that due to their characteristics may accumulate amounts or concentrations of materials in such conditions which render it contaminated; and ii) "area under the suspicion of contamination": site, land, location facility, construction or improvement with traces of being a contaminated site.

The Act foresees that when detecting traces or suspicions that a site is contaminated, the legally responsible entity should immediately communicate such fact to the competent environment and health agencies.

The technical study that is to be conducted is the "preliminary assessment", which has the purpose of clarifying if the contamination suspicion proceeds or not. This assessment was defined as an "initial assessment, based on available information, to fundament the suspicion of contamination in a site".

In case there is a fundamented suspicion of contamination one should start the "confirming investigation", which "aims at proving the existence of a contaminated site". This investigation is basically composed of the capturing and chemical analyses of samples and the interpretation of the results. The results are to be compared with the intervention values for soils and underground waters established by the CETESB.

In case the concentrations observed *in loco* are above these values the site will be classified as "contaminated site under investigation", which has been defined as the "contaminated site on which procedures are taking place to determine the extension of the contamination and the affected receptors".

In this management phase obligations were established for the environmental agency - such as, for example, carrying out the preliminary assessment at the site or request the entity responsible to adopt measures, demand confirmatory investigation - once significant changes harmful to the soil functions are detected.

In addition, the environmental agency must notify the State agencies involved (especially the organization in charge of granting the right of use of underground waters, the Municipalities, the Municipal Environmental Boards and other stakeholders), as well as determine the legally entity in charge that may start emergency action procedures.

The environment and health agencies shall implement a program that guarantees the affected population, through its representatives, the access to available information and participation in the site assessment and remediation process.

### 3.2.5 Rehabilitation and remediation of contaminated sites

The site rehabilitation process main objective is to "rehabilitate the site for a pre-established purpose". The remediation goals to be achieved should be defined based on the scenario of the soil future occupation.

After the site is classified as "contaminated under investigation", new studies are to be carried out to detail the amplitude of the contamination.

The legally responsible entity shall carry out a "detailed investigation" to establish a knowledge around the total extension of the contamination and the identification of all the receptors under risk. This investigation was legally defined as a "process of field data acquisition and interpretation which allows the understanding of the dynamics of the contamination plumes in each one of the physical means affected".

In case a water supply source is compromised, the entity responsible for the contamination shall provide an alternative drinking water source to supply the affected population.

It is important to clarify that typically a contaminated site may be remediated focusing one between two possible future situations: that the soil be compatible with **one** previously

determined **use** (“fitness for use approach”), or with **all** possible **uses** (“multifunctionality of soil approach”):

- Fitness for use clause: a health risk assessment is conducted and takes necessarily into account the scenario of future use of the land and ways through which people are (or may be) exposed to existing contaminants. The risk is **minimized** so it is possible to maintain the contaminants within the site, as long as this risk is manageable and maintained at an acceptable level. The site remediation is made as far as necessary to allow its use for the previously established purpose. Such decision is fundamented on “guideline values” for soils and underground waters (explained ahead) which vary according to each exposure scenario. In this case the site is **rehabilitated** for a determined purpose.
- Multifunctionality of soil clause: the risk is **eliminated** by the removal or total destruction of the polluting substances. The site is **recovered** to its natural conditions (i.e., concentrations prior to contamination), and may be used for whichever purposes. In this case, remediation costs may be infinitely higher than in the previous hypothesis, even causing the non feasibility of site intervention.

One starts from the premise that “certain soil uses require it to have excellent quality – such as for housing and recreation – while other uses are less demanding, such as for industrial purposes or paved parking lots” (Sánchez, 2001, p. 131).

Regarding the history of contaminated sites management in 16 European countries, Ferguson (1999, p. 33) mentions that “twenty or so years ago land contamination was usually perceived in terms of relatively rare incidents, with poorly known but possibly catastrophic consequences for human health and the environment. (...) As a result politicians responded by seeking maximum risk control: pollution should be removed or contained completely”.

However it is now widely recognized that drastic risk control, for example cleaning up all sites to background concentrations or to levels suitable for the most sensitive land use, is neither technically nor economically feasible” (Ferguson, 1999, p. 33).

To give an example, according to Ferguson (1999, p. 33) “in 1981 about 350 sites in the Netherlands were thought to be contaminated and possibly in need of remedial action. By 1995 the number had grown to 300,000 sites with an estimated clean-up cost of 13 billion ECU<sup>7</sup>. Similar circumstances exist in most other industrialized countries. Consequently, although the need for policies to protect soil and groundwater is recognized, strategies for managing contaminated land have moved towards *fitness for use*”.

The article written by Ferguson (1999) allows us to conclude that the management of contaminated sites in the 16 European countries studied is fundamentally based on the assessment of risk, be it to human health or to the environment. Most of the countries adopt the “fitness for use approach” (or *function oriented approach, suitable for use approach, cost-effective approach*), i.e., the future use of the land is taken into account to define the remediation goals to be achieved. This is of great importance for remediation to be successful and efficient both from the technical and the economic point of view.

Furthermore, guideline values are adopted for different land use scenarios as a means to assess the risk of a determined area and based on which the objectives of remediation will be defined. Eventually, the need and tendency to take into account the economic aspect to

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<sup>7</sup> European Currency Unit

find solutions for a contaminated site stood out, and today managing sites aiming at the multifunctionality of soil approach is an exception.

In this respect Cunha (1997) underlines that a point in common to all countries which elaborated contaminated sites management programs, was the high number of sites and the amount of resources necessary to their remedial. There is thus the need of evaluating the real need of remediating a contaminated site, considering the existing levels of contamination and the potential to cause harm to the health of the population. "Such procedure is generically known as health risk assessment and has been adopted in some countries as a way to determine the real need for a site remediation, as well as in the definition of the remediation system to be put in place" (p.09).

Following the trend of countries that have a tradition in managing contaminated sites, the State of São Paulo adopted the "fitness for use" approach, finally putting an end to the issue related to how extensively a site should be remediated. The Act established the risk assessment as a subsidy for making decisions regarding interventions for remediation purposes to take place in a contaminated site.

"Risk assessment" was legally defined as "the process through which risks to human health, to the environment and to other assets to be protected are identified, evaluated and quantified". When the values defined for acceptable risk are surpassed, the site will be classified as "contaminated site" and its remediation is to be provided.

The expression "contaminated site" was defined as "area, land, location, facility, building or improvement that contains **amounts or concentrations of materials** in such conditions that cause or may eventually cause harm to the human health, to the environment or to any other asset that is to be protected"<sup>8</sup>. Thus the legal concept of contaminated site is not precise and unequivocally limited, but it derives from the surpassing of acceptable risk values, that will be analyzed, in the concrete case, by means of a specific "risk assessment".

The site remediation will include the "adoption of measures for the elimination or reduction of risks to acceptable levels for the declared use", according to definition established by the Act.

After the site is classified as contaminated, the environmental agency shall inform the health agencies, when there is risk to human health, notify other public agencies involved, start the remediation procedures in tune with the ongoing emergency actions and demand the presentation of a remediation plan from the legally responsible entity.

During this phase of the site management it is an attribution of the environmental agency to determine to the legally responsible entity the contaminated site status recording on the real state registration. Such imposition has been widely discussed about due to a possible conflict with article 22, clause XXV, of the Brazilian Constitution that says that "the Union has exclusive legislative competence on public recordings issues".

However, even before the arrival of the State Act n. 13.577/2009, record on contaminated sites real state registration was already a procedure adopted by CETESB in respect to the Executive Act n. 167/2005 rendered by the Judiciary General Corrective Office, published on the State of Sao Paulo Official Gazzete on June 12<sup>th</sup> 2006.

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<sup>8</sup> The legal definition of contaminated site was provided for the first time in the Brazilian legislation, by the State of São Paulo Solid Residues Policy for (Law no. 12300, March 16<sup>th</sup>, 2006), and it is identical to the definition brought by the Act now discussed.

With all that, any possible acquirer could have available any information about past or present contamination related events on the real state.

When an acceptable risk level is reestablished for the declared use, the site will be classified as "remediated site for declared use", which is defined as "area, land, location, facility, building or improvement previously contaminated, which, after being submitted to remediation, has reestablished the level of risk acceptable to human health, considering the declared use".

Thus, besides information about the contamination ("Contaminated Site Term") CETESB also emits the "Rehabilitation of the Site for Declared Use Term" which includes the kind of use the site is specifically rehabilitated for, that will also be recorded on the real state registration.

### **3.2.6 Infractions and penalties**

The actions or omissions contrary to the Act are considered administrative infractions and will be punished with written warnings, fines, embargo, demolition or suspension of funding and of tax benefits.

A limit was imposed to the fine penalty, ranging from 4 to 4,000,000 times the value of the Fiscal Unit of the State of São Paulo - UFESP (currently calculated at approximately R\$ 17,45), and may not surpass the value of R\$ 50,000,000 (fifty million reais).

## **4. Conclusions**

The Act n. 13.577/2009 constitutes the first public policy issued in Brazil about contaminated sites management. It came to fulfill a great legal, as well as technical gap. It brought to the Brazilian Environmental Law important definitions on technical terms, it established the legal entities responsible for the contaminated site remediation and it determined the management stages to be followed.

It also adopted the risk assessment as an important decision making tool as far as the site intervention will be developed on the terms of the "fitness for use" approach.

The Fund created by the Act, following a tendency on countries with a established tradition on contaminated sites management, will specially contribute to an effective management of certain "orphan" and abandoned sites as it habitates and financially enable the State's action.

Under the institutional aspect the Act established an "exchange among institutions" as one of many ways of reaching its goal. On the various management phases it will be necessary for the involved public bodies to communicate with each other imposing an effective and efficient information exchange in a way that each entity, in its particular area of competence, establishes the necessary procedures on it administrative routine. That was exactly the objective of the article 50 that states that "the State Environment Secretary and Health Secretary should establish common procedures and routines for any joint campaigns aiming the prevention or formation of contaminated sites as well as the identification and remediation of existing ones". We point out that the municipalities also should be inserted in such a process in a way to specially consider the adoption of this issue in its urban and environmental planning.

Under the important aspect of publicity the Act has institutionalized the contaminated sites registration database, imposing the publication of such information on the State

Environment Secretary website as well as on the State Official Gazzete. On an innovative fashion, meaning an important move to make the information available to the general public, it determined the record of contamination site status and of rehabilitated site status on the real state registration.

Some important issues still need to be regulated, for example: the way the participation of the affected population will take place on decisions regarding a site intervention; specification of “bank collaterals” and “environmental insurances” as financing tools to guarantee the site remediation; and effective creation of tax and crediting incentives.

This innovative Act will probably set a national tendency in a way that other states of Brazil will probably create their own public policies on contaminated sites regarding regional particularities. A national public policy would be welcome as to establish directives and general clauses on the concurrent legislative competence of the Union, States and Federal District on environmental protection and pollution control issues. A national policy would also fulfill legal gaps for any state that hasn't developed its own legislation, which can also be subject of future researches.

## 5. References

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