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NRB 2001

# A2 Soil protection and the Soil Protection Guideline

## 1 Preventive soil protection

This chapter gives an overview of the Dutch policy on preventive soil protection and serves as a basis to found a soil protection strategy by the NRB user.

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## 2.1 Soil protection policy

### 2.1.1 Policy framework

#### a Legislation and regulations

Source-based soil protection policy draws a distinction between diffuse and point sources. Soil protection in the case of diffuse sources is not regulated by the NRB.

Point sources that are hazardous to the soil include:

- the landfilling of waste;
- the use of category 2 building materials;
- discharges into the soil;
- transport between establishments via pipelines;
- the storage, transshipment and transport of materials within establishments;
- industrial processes.

Only the last two activities are covered by the NRB.

Point-source pollution must be avoided. If this is not possible, then the burden on the environment of an environmentally hazardous activity must be as low as is reasonably possible. This departure point is expressed in the ALARA principle (as low as reasonably achievable), which is expressed in concrete terms in the NRB, in relation to soil protection connected with industrial activities, by the duty to reduce the risk to the soil to a negligible (or at most acceptable) one.

The ALARA approach is anchored in the Environmental Management Act (section 8.II (3)) and ties in closely with the way in which the duty of care is expressed in section 13 of the Soil Protection Act. This speaks of the duty 'to implement every measure that can reasonably be demanded to avoid contamination'.

#### a.1 The Environmental Management Act

The Environmental Management Act came into effect in 1992. Chapter 8 of the Act regulates the measures for protecting the environment in establishments through permits or general administrative orders. This also applies to protection of the soil, unless regulations in this respect are contained in a decree on the basis of the Soil Protection Act.

##### a.1.1 Environmental permits

Environmental permits are the principal instrument provided for in the Environmental Management Act. Under the permit, conditions may also be imposed for protection of the soil. The requirements to be met by the nature, implementation, maintenance and inspection of facilities, as well as the associated measures, are laid down in the permit conditions.

The NRB was developed to support the permit-granting process. Application of the NRB results in an optimum soil protection strategy.

The decision on the permit is taken on the basis of the permit application. Depending on the size and complexity of the establishment, the permit application must contain the following information for assessing soil protection:

- the findings of the soil investigation baseline situation;
- the measures and facilities to be implemented; These must be based on the combination of measures and facilities per activity or subactivity resulting in a negligible, or at least an acceptable, soil risk. If the measures and facilities have not been implemented when the permit takes effect, an action plan and programme of implementation will have to be proposed;
- the control procedures to be pursued, e.g.:
  - a maintenance and inspection plan;
  - an incident management plan including a reporting procedure;
  - monitoring plan to reduce the risk, where necessary.

In view of the current trend of incorporating more and more target conditions instead of means conditions in permits, it is recommended that the description of soil protection measures and facilities be included as far as is possible in the permit application. The application can then form part of the permit. The party applying for a permit and the permit-granting authority need to make agreements on this during their preliminary discussions.

#### a.1.2 General administrative orders (section 8.40 Environmental Management Act)

The legislator has drawn up general rules governing a number of categories of establishment. Establishments belonging to these categories do not require a permit if their size and make-up do not exceed certain limits. These establishments are in that case required to comply with the rules contained in general administrative orders. The general administrative orders may incorporate requirements relating to means and inspection, including rules for protection of the soil.

Under section 8.40 of the Environmental Management Act general administrative orders have been or will be drawn up.

An overview of these Administrative Orders can be found on the website [www.infomil.nl](http://www.infomil.nl). Check [www.overheid.nl](http://www.overheid.nl) for their content.



If general administrative orders require soil protection measures and facilities that are not described in detail, the NRB can sometimes provide a solution. The use of the NRB by section 8.40 companies depends, however, on the leeway provided by the soil protection regulations in the relevant general administrative order. When the above general administrative orders were drafted, the soil protection measures and facilities were elaborated (as of October 2000) in regulations governing means and conduct which are geared to achieving the negligible soil risk referred to in the NRB.

The soil protection stipulated in the general administrative order may in certain situations not be the most suitable solution. In that case, these general administrative orders allow the competent authority to opt for an alternative soil protection strategy on the basis of the NRB, which through further requirements also results in a negligible soil risk.

#### a.2 *The Soil Protection Act*

The Soil Protection Act came into force in 1987. Its object is to create a national framework for protection of the different soil features and to achieve a general level of soil protection.

With regard to the source-based measures, sections 6 to 11 of the Soil Protection Act indicate the activities these measures may target.

The general duty to clean up the soil is anchored in section 13, which has direct applicability:

'Anyone carrying on activities on or in the soil as referred to in sections 6 to and including 11 and who knows or could have reasonably suspected that these activities might contaminate or have an adverse effect on the soil has a duty to implement any and all measures that can reasonably be demanded of him in order to avoid this contamination or adverse effect or if this contamination or adverse effect occurs, to clean up the soil or the adverse effect and to limit and undo as far as is possible the immediate consequences thereof. If the contamination or adverse effect is the result of an unusual occurrence, the measures must be taken immediately.'

In the field of prevention the Soil Protection Act is in the nature of a framework act, which means that the Act does not itself contain any material standards, with the exception of the duty of care. The Soil Protection Act provides the framework for setting rules via general administrative orders which are to be met by a number of categories of activities hazardous to the soil (source-based policy). In view of the scope of the NRB, reference is made to the **Storage in Underground Tanks Decree** (BOOT, Bulletin of Acts, Orders and Decrees 1993; 46) which contains regulations governing the storage of liquids in underground tanks. The Decree also stipulates that tanks no longer in use must be cleaned and decommissioned or removed.

#### a.3 *Policy of provincial and local authorities*

The policy of provincial authorities on soil protection is laid down in *provincial environmental policy plans*. These devote specific attention to the protection of the groundwater for the purpose of providing drinking water. In view of the vulnerability of the extraction points, areas have been designated around these points within which activities that are hazardous to the soil require particular care.

Provincial environmental ordinances provide concrete rules for protection of the groundwater, e.g.:

- the designation of areas;
- regulations for establishing and expanding specified types of establishment in groundwater protection zones via instructions that are to be detailed by the local authorities;
- ban on establishing specified types of establishment in groundwater protection zones, including water extraction zones;



- actions, conduct, as well as regulations that go further than the national regulations for section 8 establishments.

In a groundwater protection zone a company may be confronted with provincial policy that may impose more stringent requirements which depart from the general approach of the NRB.

Local authorities can draw up *local authority environmental policy plans* in which they lay down their policy on soil protection. If a local authority environmental policy plan is in force, the municipal executive is required to take this plan into account when granting permits, among other things. The requirements laid down in these plans must as a minimum be equivalent to what is demanded within the framework of the NRB.

#### *a.4 User group policy and covenants*

Covenants have been concluded with a number of branches of industry relating to limiting the burden on the environment in relation to production processes. These covenants also incorporate agreements on soil protection. For a number of branches of industry, implementation of the covenant is backed up by manuals or workbooks which are specifically tailored to that branch of industry and describe potential environmental measures. In addition, the methods for assessing the risk to the soil have been further specified for certain branches of industry.

Where a manual or workbook of this kind has been or is being prepared for a branch of industry, it will be geared to the NRB. *In that case*, specifications elaborated in consultations within the user group can be seen as a further detailing of the general NRB framework.

#### *a.5 Economic instruments*

The voluntary depreciation of environmental investments scheme (VAMIL) and the scheme for designating deductions for environmental investments (MIA) make investing in eco-friendly capital goods more attractive from the tax point of view. The schemes apply to assets listed on the current 'Environmental List'.

The MIA can be seen as a supplement to the VAMIL. Certain soil-protection facilities on the VAMIL list are categorised in the MIA for higher (30 or 15%) investment deduction facilities. Means required by law are excluded from the scheme.

The investment deduction facilities for certain assets may change in the next few years. Information on the current environmental list can be found on the VAMIL website ([www.vamil.nl](http://www.vamil.nl)) [in Dutch only].

## **b Supplementary instruments**

### *b.1 Quality assurance facilities*

When constructing and repairing impermeable facilities, inspections must be carried out to ensure that they are indeed impermeable on completion. Quality assurance plays a part in this. Impermeability is guaranteed if the facility has a valid PBV Impermeable Facility Certificate.

In late 1993, on the initiative of the Netherlands Information Centre for Soil Protection Facilities (NIBV), the Centre for Civil Engineering Research and Codes (CUR) and the certification body Kiwa, the Soil Protection Facilities Programme (PBV) was set up with the support of the Environment Ministry (VROM). Implementation of this plan encompasses the development of clear guidelines for the design, construction, repair, management and inspection of impermeable floors, pavements, seals and industrial sewers, with quality assurance playing a central role.

Part B2.3 of the NRB looks in detail at quality assurance in relation to impermeable soil protection facilities.

### *b.2 Quality assurance measures/internal environmental protection*

A company can set out its soil protection measures in an environmental protection system. A system of this kind enables a company to assume its own responsibility. The conditions of the permit can in that case target objectives, thus allowing the company to operate more flexibly. The competent authority cannot, in fact, prescribe an environmental protection system. Important elements of an environmental protection system can be inspections and supervision, incident management and periodic soil investigations (see part A4.2 in this respect).

An in-house environmental protection system can constitute part of a more comprehensive quality assurance system or other type of protection system.



### 2.1.2 Policy implementation

Where a industrial activity is hazardous to the soil, all the steps that can reasonably be demanded must be taken in order to avoid it polluting or having an adverse effect on the soil. Any adverse effect on the quality of the soil must be cleaned up.

Preventive soil protection in the case of industrial activities can be achieved using effective combinations of facilities and measures. The NRB indicates where and how a negligible soil risk can be realised. In certain situations the soil risk can be rendered acceptable by anticipating cleanup of the soil and monitoring soil quality by means of specific soil investigations aimed at limiting risks (monitoring).

Even with a negligible soil risk, the possibility of soil contamination remains. This contamination – emerging from baseline and final situation soil investigations – is likewise subject to a cleanup duty.

#### a Measures and facilities

Environmental policy draws a distinction between source-based and effect-based measures and facilities.

##### a.1 Source-based measures and facilities

In the NRB the term ‘source-based’ is taken as synonymous with ‘emission-based’, i.e. aimed at preventing emissions. Examples of source-based measures and facilities are:

- procedures and changes in company operations that reduce the risk to the soil, e.g.
    - replacing substances hazardous to the soil with others,
    - reducing stocks,
    - using materials in a form less mobile for the soil;
    - grouping activities hazardous to the soil
- In environmental policy these measures are preferred to other solutions. In practice, source-based solutions can often not be implemented, or only partially, without having a material impact on the commercial activity. Often, an effect-based approach is necessary as well. The NRB does not go into the detail of these measures, but refers the reader to general emission and prevention policy [3];
- additional facilities in the installations for keeping materials hazardous to the soil within their casing, e.g. improving seals on equipment, flange-free joints and double-walled systems equipped with leak detection.

##### a.2 Effect-based measures and facilities

The term ‘effect-based’ in the NRB is synonymous with ‘immission-based’, i.e. aimed at combating *penetration* of the soil.

The object of effect-based measures and facilities is to prevent or limit dispersion to and in the soil (immission) caused by harmful materials that have escaped their enclosure (emission).

Effect-based measures include installing impermeable facilities and/or immediately clearing up substance spills, for example.

#### b Negligible soil risk

Whether a company is required to implement measures and facilities and, if it is, which ones, depends on the risk of soil contamination. This ‘soil risk’ is determined by:

- the substances present (emission risk);
- the nature of the installation and the measures and facilities (immission risk);
- the extent to which a substance can disperse further in the soil (risk of dispersion).

The NRB takes as its departure point that, where possible, a negligible soil risk (soil risk category A) must be effectuated for industrial activities. To provide support for decision-making on effective preventive soil protection, the Beslismodel Bodembescherming Bedrijfsterreinen (BBB) [Decision-making model for Soil Protection on Company Premises] has been developed within the framework of the NRB (see section 2.3.4). The BBB describes soil risk primarily as the risk of penetration into the soil. Effective measures and facilities are therefore selected using the soil risk checklist (see Part A3.3).

##### b.1 ALARA and the state of the art

The ALARA principle from the Environmental Management Act is a major departure point with respect to limiting emissions in order to protect the environment and, hence, the soil as well. The ALARA principle is implemented by incorporating conditions in permits for industrial activities which provide the greatest possible protection.

For the purpose of permit application ‘Best Available Techniques’ (BAT) should be implemented (IPPC directive 96/61/EG, 24 September 1996). Combinations of measures and facilities which according to the soil risk checklist result in an emission score of 1 – i.e. a negligible soil risk – represent the state of the art and so comply with the ALARA principle.

If – even using Best Available Technology – the remaining soil risk is considered to be unacceptable, the activity is to be refused.

##### c Policy in existing companies

In existing situations in which companies do comply with the conditions of their current environmental permit but do not have the level of environmental protection required under the NRB, the competent authority can attach supplementary conditions to the environmental permit. This therefore also applies to soil protection measures and facilities. The state of the art and changes in the quality of the environment may justify supplementary regulations.

Section 8.22 of the Environmental Management Act allows the competent authority to modify a permit *ex officio* (updating modification).

Another possibility for requiring additional soil protection facilities is the revision permit. However, the competent authority can only require an application for a revision permit if there exist several permits for



the site or otherwise the company's permit situation became very unclear. A revision permit covers the whole site.

Sometimes in the case of existing companies a situation involving an increased or high soil risk has to be permitted temporarily. In that case, an action plan needs to be drawn up in consultation between the relevant parties establishing when and how the soil risk will be reduced to at least an acceptable risk. In addition, guarantees must be provided for the unanticipated need to clean up the soil (see section 2.3.4).

*c.1 Connection between soil protection and the implementation of soil remediation operations*

Soil protection facilities may be installed on an underlying surface containing 'historic' soil contamination (i.e. pre-1987) which is not 'urgent' in the meaning of the Soil Protection Act. The same applies to instances of soil contamination for which there is no prospect of a remediation in the near future and/or situations in which remediation, in situ or otherwise, will not be obstructed by the planned structural facilities.

However, situations may occur in an existing establishment where soil protection facilities will need to be put in place at locations where soil remediation is to be carried out in the near future. These include the following:

- 1 soil contamination that must be tackled as soon as possible under sections 13 and 27 of the Soil Protection Act;
- 2 soil contamination which the competent authority has decided must be remediated within a period of four years at most following the authority's decision; according to the timing system, these are urgent cases from category 1 [16];
- 3 all other instances of soil contamination which the owner of the premises has indicated will be remediated, and within a period of at most four years.

In that case, the remediation and installation of soil protection measures can be coordinated in order to avoid the wasted investment.

For the cases referred to in 1 and 2 it is worth considering postponement of the deadline by which soil protection facilities be installed until after completion of the remediation operation, as this has to be carried out within a foreseeable period. In the case referred to in 3, it may mean bringing the remediation operation forward.

The possibility of temporary preventive facilities and the relevant soil risk category will be taken into consideration when coordinating operations.





## 2.2 Cleanup duty and soil protection

Even if measures and facilities have made the risk of soil pollution negligible, contamination of the soil cannot be fully ruled out. In that case, pollution of the soil may be revealed by a comparison of the final situation soil investigation and the baseline situation. Here again the permit holder is liable for cleaning up the soil after the soil has been polluted by industrial activities. In situations where facilities and measures do not result in a negligible soil risk, the quality of the soil will need to be monitored by means of effective monitoring of soil quality to reduce risk.

Pollution of the soil revealed by a soil pollution investigation or monitoring to reduce the risk must be cleaned up (cleanup duty).

### 2.2.1 Cleanup duty

Under the duty of care provisions of the Environmental Management Act (section 1.1a) and the Soil Protection Act (section 13) a company has a duty to clean up the soil on discovery of pollution of the soil. This cleanup duty exists irrespective of whether the company has achieved a negligible soil risk (A). Restoration of the baseline situation is the starting point for soil cleanup following any pollution, making use of state of the art cleanup technologies (see Handboek Bodemsaneringstechnieken [Soil Remediation Techniques manual]), which will be constantly updated for this purpose [66]).

In complying with the cleanup duty, the principle of reasonableness plays a part. The principle of proportionality (General Administrative Law Act section 3.4) states that the consequences of the penalty to be imposed (soil cleanup costs) and the interest intended to be served (restoration of the baseline situation) must be in proportion. The competent authority will therefore need to verify whether the severity of the pollution of the soil justifies the consequences of cleaning up the soil as soon as possible, especially when:

- the soil has been demonstrably polluted but the contamination caused cannot be measured;
- the immediate introduction of the cleanup duty is incompatible with the continuation of operations.

Facing the NRB, the cleanup duty is aimed at future pollution only. Due to the preventive measures and facilities the scale of future pollution will be rather small. Soil pollution investigation based on NRB Part B1 minimalises plume lengths and so costs for cleanup. The environmental target for soil cleanup is restoring the soil quality as determined by the baseline soil quality investigation (see Part B1.4).

Within this framework the Draft Decree on Financial Guarantee [Government Gazette 17 July 2001,134] cleanup costs are estimated to € 22.500,-. This sum gives a rough indication of the State of the Art cleanup

technology to be selected. Soil quality restoration should not last more than several years.

If the company has not – yet – achieved a negligible soil risk – in other words has consciously accepted a risk of soil pollution – other starting points apply and the baseline situation must be restored immediately.

### 2.2.2 Soil pollution investigation a Comparing baseline and final situation of the soil

Permits granted under the Environmental Management Act may require future-orientated investigations of soil pollution for activities within an establishment that are hazardous to the soil. These investigations consist of determining the baseline situation, prior to commencement of the activity, and an identical investigation on termination of the activity.

According to Section 5.5 of the Establishment and Licences Decree a permit application should include a baseline soil quality investigation report. The competent authority may reject an application if such a report is missing.

The NRB states which industrial activities are hazardous to the soil (see Part A3.1/2). The competent authority will need to decide per establishment, on the basis of its permit application and, where necessary, a visit to the company, whether activities hazardous to the soil do actually take place.

The object of prescribing a baseline situation soil investigation is to establish the reference level of the actual soil quality (soil and groundwater). This provides a test basis in the event of future soil contamination. Even if the soil risk is negligible, obtaining this test basis is necessary in order to be able to establish - by means of a final situation investigation - whether soil contamination has occurred in spite of the protective measures and facilities implemented.

Final situation soil investigations are generally included in the conditions of the environmental permit. See also the publications issued by VROM<sup>1</sup> and VNG<sup>2</sup> governing these investigations.

The soil pollution investigation targets possible future soil pollution. It confines itself to the locations and substances inside the establishment where soil pollution could occur.

Baseline and final situation investigations are strictly linked: differences (if any) in the investigation results indicate whether the soil has been polluted as a result of the relevant activity. So, where a final situation soil investigation is prescribed, a similar baseline investigation must be executed (and vice versa), as only then is it possible to establish any difference in soil quality.

<sup>1</sup> Ministry of Housing, Spatial Planning and the Environment (VROM), Directorate-General for Environmental Management/Soil Directorate, *Baseline Situation Soil Investigation*, August 1994.

<sup>2</sup> Association of Municipalities (VNG) letter to members 94/245, *Baseline situation conditions of environmental permits under the Environmental Management Act*, 21 November 1994.



### *ai Repeat soil investigation*

Sometimes a periodic repeat of the baseline situation investigation is also required. The competent authority will include this repeat investigation requirement in the permit if it thinks the time span between the baseline and final situation investigation is unacceptably long. This allows early intervention by the - then still - active company in the unanticipated event of pollution of the soil. On the termination of an industrial activity it is sometimes difficult to hold those responsible for the contamination to account. Carrying out a soil pollution investigation well before the activity is discontinued means that any soil cleanup can be completed by the time the activity is actually terminated.

A decision will need to be taken on a case-by-case basis on whether in the event of a negligible soil risk it is reasonable and useful to prescribe a repeat soil investigation using existing facilities.

### **2.2.3 Monitoring soil quality to reduce the risk in connection with acceptable soil risk**

If the realisation of a negligible soil risk appears unreasonable, the risk can be made acceptable (soil risk category A\*) through implementation of an effective monitoring system to reduce the risk, subject to the strict proviso that any soil cleanup is sufficiently guaranteed. The competent authority will be the judge of whether this is the case. The criteria for this monitoring system are detailed in NRB part BI.5.

The object of monitoring soil quality to reduce the risk is to minimise the scale of soil pollution (and hence to keep the cleanup costs within reasonable bounds). The structure and implementation of a good and reliable monitoring system may consequently be more comprehensive than soil pollution investigations. Monitoring itself focuses not on the solid soil phase but on soil air and/or groundwater.

The failure of soil protection is only discovered through monitoring to reduce the risk after pollution has occurred. That is why soil monitoring is always linked to (*anticipating and performing*) soil cleanup operations. If the soil is found to be polluted, it must be cleaned up as soon as possible, unless stipulated otherwise for the source in question in a pre-agreed 'Action Plan for Soil Cleanup Operations'. If necessary, temporary control measures must be taken immediately. The competent authority will be the judge of the need for these control measures.

## **2.3 Decision-making model for soil protection on company premises**

The NRB incorporates the Decision-making model for Soil Protection on Company Premises which is used to establish soil risks in a semi-quantitative manner, taking into account the chosen method of soil protection.

The emission and immission risk is decided with the aid of the soil risk checklist.

The model chosen can be put to generally applied and is practical and easy to use. It allows a certain amount of freedom in the choice of a soil protection strategy: there is room for alternatives. So the soil protection strategy to be implemented – the end result of the application of the BBB – is not a fixed quantitative end product, although the end result does produce a fairly rigidly formulated solution, whose formulation can be reproduced and is transparent.

The BBB takes the following as its departure points:

- using state of the art measures and facilities, the soil risk must, where possible, be reduced to a negligible level;
- where (in existing situations) it is unreasonable to make the soil risk negligible, the primary aim must be to minimise *the scale of the pollution*.

In practice, the BBB primarily targets the emission and immission risks. Only in exceptional cases does the risk of dispersion also play a part.

The BBB recognises that in some cases the soil risk cannot within reason be reduced to a negligible level using state of the art emission- and immission-reducing measures and facilities. This leaves a risk of soil pollution, the residual risk as it is known. In that case, with unwanted penetration into the soil in mind, the degree of dispersion plays a role. With the aid of soil quality monitoring to reduce the risk, it is possible to detect and tackle dispersion in the soil at an early stage. The requisite intensity of sampling therefore follows from the risk of dispersion.

### **2.3.1 Scope of application of BBB**

The BBB applies to the carrying on of 'ordinary' industrial activities and relates to structural emissions, e.g. spills and leaks, that are inherent to normal operations.

The BBB therefore does not provide for soil protection measures and facilities in the event of disasters and catastrophes, e.g. fire, explosions, the catastrophic failure of tanks, etc. Facilities and measures for containing hazardous materials and fire extinguishing water are regulated in a different policy framework (CPR 9 and 15 series) [18, 19, 20, 21, 22, 23].



It goes without saying that the BBB takes into account the contribution towards reducing the risk of soil contamination made by measures and facilities already in place whose aim is to prevent or control catastrophes or disasters. The BBB applies to existing and to new situations.

### 2.3.2 Soil risk categories

Soil risk categories – and, as a derivative of these, soil protection strategies – are fixed per activity.

The BBB method is detailed in the NRB Stappenplan [NRB Procedure] (see part A3.2).

In summary, it means that the risk of emission is determined using a checklist, and is expressed in a so-called emission score. The soil risk category follows directly from the emission score:

Emission score	Soil risk category
1	A negligible soil risk
2	B increased soil risk
3-5	C high soil risk

The *emission score* plays the most important part in the BBB.

Besides the emission score, the decision-making involves considerations towards the amount of contamination emitted, the chemical and physical properties of that contamination and the soil structure and its hydrogeology. These parameters determine the soil volume to be cleaned in case of an accidental pollution. NRB Part B1 describes in what way these factors determine the intensity of the needed soil investigation having negligible and/or acceptable soil risk.

The emission score is determined by the type of industrial activity and the present or planned soil protection measures and facilities. The aim is to reduce the emission risk with the aid of measures and facilities, additional or otherwise, until an emission score of 1 has ultimately been reached, in which case the risk of soil contamination will be negligible (A).

Each level of risk requires action of its own, which must be taken by the various parties:

- *Negligible soil risk (A)*

Industrial activities with a negligible soil risk do not require any additional soil protection measures. A permit for these can be granted as they are. Because soil pollution cannot be ruled out completely in these cases either, the quality of the soil must be established prior to commencement of the activity by means of a baseline situation soil investigation, so that on termination of the activity any soil pollution caused by the activity can be established unambiguously. The requirement of a final (and baseline) situation soil investigation must be incorporated in the permit conditions.

- *Increased or high soil risk (temporary or otherwise) (B/C)*

For industrial activities with an increased or high soil risk, additional measures must be taken and facilities provided. New activities with an increased or high soil risk must be refused (see 2.1.2-b.1).

It is not always possible within reason to tackle situations with an increased or high soil risk in existing situations in the short term. In order to be able to permit these situations temporarily, specific, frequent soil investigations and assurance that the soil will be cleaned up are essential. When and how the soil risk will be reduced to (preferably) a negligible risk must also be laid down.

In certain cases an increased soil risk can, subject to strict conditions, be transformed into an acceptable soil risk with monitoring of the soil quality to reduce the risk and a 'Action Plan for Soil Cleanup Operations' (see below).

- *Acceptable soil risk (A\*)*

In certain instances a non-negligible soil risk can be transformed into an acceptable soil risk. Acceptable soil risk involves guarantees for fast detection of pollution and anticipation to the cleanup of the soil in the event of any pollution.

Also minimum soil protection measures and facilities are required to be operational.

Two different situations may apply:

- 1 a quality insured soil polluting incident management system, involving:
  - Early warning in case of a soil polluting incidents by means of leak detection, soil quality monitoring and/or using frequent inspection of equipment and supervising activities;
  - Immediate and effective action to restore baseline soil quality after a soil polluting incident;
  - Quality insurance procedures aimed at adaptation of work instructions, supervision procedures, replacement of equipment and/or improved maintenance in order to prevent future incidents.
- 2 From situations having an increased soil risk (B) using soil quality monitoring to minimise the volume of polluted soil. The volume of soil to be cleaned up must be kept within reasonable proportions through specific, frequent monitoring of the soil quality near the industrial activity in question. The departure points for monitoring to reduce the risk are detailed in NRB part B1.5. Monitoring of the soil quality to reduce the risk and soil cleanup is in some cases not technically and/or financially feasible. Consequently, achieving an acceptable soil risk is not always possible. All this must be laid down in an Action Plan for Soil Cleanup Operations approved by the competent authority.

Ultimate soil protection in the case of an acceptable soil risk is equivalent to that with a negligible soil risk, so a permit can be granted.

### 2.3.3 Weighing up acceptable soil risk

In existing situations it is sometimes possible – if additional measures and facilities do not appear reasonable – to weigh up and make a conscious decision between a negligible and an acceptable soil risk for a given part of the industrial. This decision relates to a substantial degree to the costs, and the feasibility of a negligible risk depends on many preconditions.

In general, the soil risk posed by industrial activities must be negligible. Only when the possible unreasonableness of a negligible soil risk has been demonstrated to the satisfaction of the competent authority can the feasibility of an acceptable soil risk be considered. The choice between a negligible and an acceptable soil risk is therefore not an economic consideration of the most favourable soil protection strategy from the point of view of cost.

The cost ratio between more expensive facilities and their planned time of operation towards those for monitoring to reduce the risk with the assurance of soil cleanup play a part in deciding between a negligible and an acceptable soil risk. Also, the possibility of being able to monitor effectively and the expected effectiveness of any soil cleanup operations are also deciding factors in this consideration.

Various organisational preconditions apply to the acceptance of an acceptable soil risk.

A strategy involving soil risk management (see Part A4.2.4 also) included within an environmental needs quality assurance.

In those instances where risk reducing soil monitoring determines whether the soil risks is acceptable or not, Operations must be aimed at maintaining the network developed on the basis of the Richtlijn Monitoring [Monitoring Guideline, see Part B1.5] for soil investigations to reduce the risk and taking groundwater and/or air samples with strict regularity and having them analysed by an accredited laboratory.

The soil risk reducing monitoring as such, the maintenance of the sampling network/equipment and the anticipation to soil cleanup should be incorporated in the companies site maintenance plans and/or environmental care system in a way clear to the competent authority.

## 2.4 Security for cleanup duty; insurability of soil risks

Achieving a negligible soil risk is the departure point for application of the NRB. The guideline sometimes offers companies in existing situations the opportunity to achieve an acceptable soil risk. If a company opts to make the soil risk acceptable instead of negligible, it is consciously taking a greater risk of having to restore the baseline situation in the event of pollution of the soil. This will have consequences for the insurability of soil risks.

It is reasonable to assume that in the case of a negligible soil risk it will be easier to cover the cost of soil cleanup operations with an environmental liability insurance than it will be in the case of an acceptable risk, provided that the effective operation of measures and facilities is guaranteed.

Things are different for situations with an acceptable, increased or high soil risk. In these cases it will be necessary to anticipate restoration of the baseline situation (e.g. by means of financial security). The thing to do in these cases is to limit the volume of soil that may need cleaning up – and hence the cost – through monitoring to reduce the risk.

