Flemish Government

Ministerial Decree establishing the standard procedure for the descriptive soil investigation under the Soil Decree of 27 October 2006

Legal bases

This Decree is based on:

- the Soil Decree of 27 October 2006, Article 38(2), as amended by the Decree of 8 December 2017;
- the VLAREBO Decree of 14 December 2007, Article 7.

Procedural requirements

The following procedural requirement has been met:
- Having regard to OVAM's proposed standard procedure for the descriptive soil investigation of 9 December 2024.

Legal context

This Ministerial Decree is in line with the following regulations:
- the Ministerial Decree of 27 April 2020 establishing standard procedures under the Soil Decree of 27 October 2006.

THE FLEMISH MINISTER FOR ENVIRONMENT AND AGRICULTURE HEREBY DECREES:

Chapter 1. Establishment of standard procedure

Article 1. The standard procedure for the descriptive soil investigation is set out in the Annex to this Decree.

Chapter 2. Repeal provision

Article 2. Article 2 and Annex 2 of the Ministerial Decree of 27 April 2020 establishing standard procedures under the Soil Decree of 27 October 2006 are repealed.

Chapter 3. Transitional provisions

Article 3. Descriptive soil investigations for which the report is submitted to OVAM before 1 February 2025 and which OVAM assesses after 31 January 2025 shall be assessed against the standard procedure in force at the time the descriptive soil investigation report was submitted.

Article 4. Descriptive soil investigations for which the report is submitted to OVAM in the period from 1 February 2025 to 30 April 2025 must comply with:
1° the standard procedure for the descriptive soil examination, laid down in Annex 2 to the Ministerial Decree of 27 April 2020; or
2° the standard procedure for the descriptive soil investigation, established in the Annex, attached to this Ministerial Decree.

Chapter 4. Entry into force of the provision

Article 5. This Decree shall enter into force on 01 February 2025.

Brussels, ... (date).

The Flemish Minister for Environment and Agriculture,

Jo BROUNS

Annex. Standard procedure for descriptive soil investigation

Single Article. The standard procedure for the descriptive soil investigation referred to in Article 1 of the Ministerial Decree of [date of MD] establishing the standard procedure for the descriptive soil investigation under the Soil Decree of 27 October 2006 is established as follows:

STANDARD PROCEDURE FOR THE DESCRIPTIVE SOIL INVESTIGATION

CONTENTS

Part 1: Introduction

1 FRAMEWORK

1.1 SYNOPSIS

This standard procedure is a manual for conducting a descriptive soil investigation and for drawing up and submitting a report thereof, as referred to in Article 38(2) of the Soil Decree.

A descriptive soil investigation is conducted and its report drawn up under the guidance of a type 2 soil remediation expert. This standard procedure is addressed to the soil remediation expert and is therefore written accordingly.

This standard procedure uses the following symbols as a reading guide [1]:
- **Binding elements** (↑) are always mentioned in the approach and appear in the report.
- The **guiding elements** (↗) may be deviated from with justification. The substantiated and credible justification should be included in the report.
- The **advisory elements** (↘) may be deviated from with justification. The deviation and justification should not be included in the report.
- **Additional clarification** (↓)

Codes of good practice and other technical scientific information are available as support. Consult www.ovam.vlaanderen.be for further information.

This standard procedure describes the steps to be followed for conducting a descriptive soil investigation (Part 2) and for reporting and data transfer (Part 3).

1.2 PURPOSE OF THE DESCRIPTIVE SOIL STUDY

↑ In the descriptive soil investigation, the severity of soil contamination is determined. You collect the data in order to make a statement about:
- The location and extent of the contamination. You map the contamination horizontally and vertically to the level of the guide value. You determine which land is contaminated. You calculate the volume of contamination and the theoretical pollutant load.
- A current or potential risk. You perform a risk assessment for the contamination based on the conceptual site model.
- The need for soil remediation. You investigate the nature of the contamination and check whether the associated remediation criterion has been exceeded.

[1] The reading guide is only relevant if the element is applicable. Example: Containing groundwater contamination is, of course, not binding if the groundwater is not contaminated. This should therefore not appear in the report.

- The priority of soil remediation.
- The need for safety and precautionary measures pending soil remediation works.
- The need for recommendations for use.

↑ You specify which soil contamination subject to investigation is included in the descriptive soil investigation. This is the research subject of the descriptive soil investigation and is hereinafter referred to as '**contamination**'.

↗ Conduct a descriptive soil investigation for the entire group of substances to which the remediation criterion applies, including their relevant degradation products and additives.

↓ The descriptive investigation is not limited by administrative boundaries but by the spread of contamination which has occurred on the site. Contamination must also be contained outside the site or plot boundaries.

↑ During the descriptive soil investigation, do you identify other contamination that is not the subject of the investigation? Also mention this contamination in the descriptive soil survey. You interpret and report the results at least as in an exploratory soil investigation or follow the guidelines of this standard procedure.

1.3 CONCEPTUAL SITE MODEL AS BASIS FOR DESCRIPTIVE SOIL INVESTIGATION

↑ The soil descriptive study shall determine the severity of the contamination. To this end, you strive for a complete and accurate picture of the contamination situation and the impact of this contamination on the environment. An essential part of this process is the development of a conceptual site model.

What is a Conceptual Site Model?
A conceptual site model is a three-dimensional thought model. The model examines soil contamination in relation to the soil system in which it is located by identifying sources, distribution and exposure routes, and potential risks and receptors. A conceptual site model aids in risk assessment and in detecting gaps in knowledge.

↓ The conceptual site model must evolve during the descriptive soil investigation. Conducting a descriptive soil investigation is thus 'cyclical' in nature.

↓ During the investigation, you 'feed' the conceptual site model with the collected information. This gives a more complete picture of the pollution situation, allowing the research strategy to be refined. You must revise the conceptual site model based on the sampling and analysis results until the contamination situation is sufficiently clear to make a substantiated statement about the nature and severity of the contamination. figure 1 illustrates this principle.

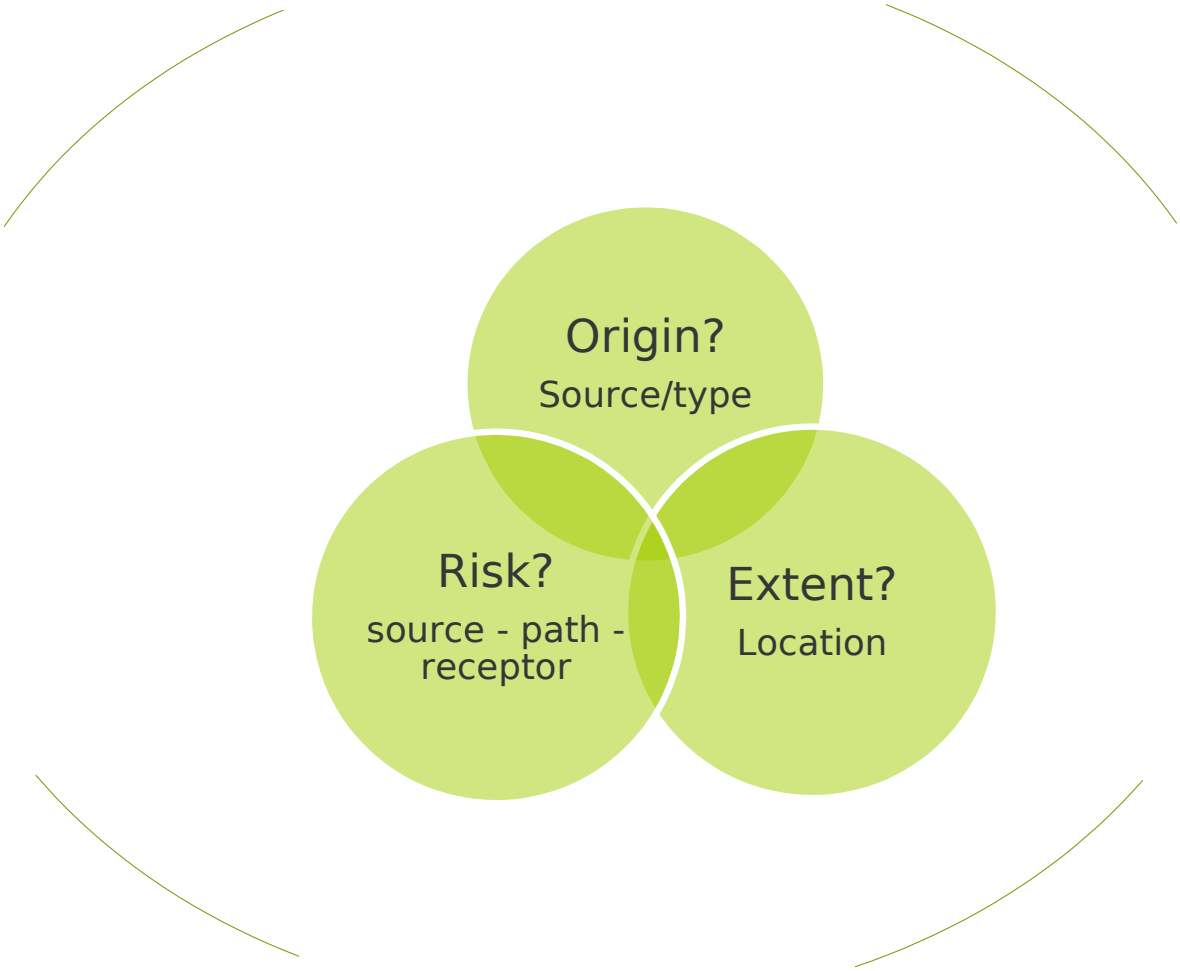

figure 1: cyclical approach to descriptive soil investigation

1.4 VALIDITY OF THE DATA

↑ You must ensure that the content of the soil descriptive investigation report is representative at the date of signature and thus provides a realistic and up-to-date picture of the contamination status.

↗ It is appropriate to update relevant older analysis results. Consideration should always be given to possible spontaneous evolution of the contamination.

1.5 YOUR TASKS AND RESPONSIBILITIES

↓ It is your task and responsibility to follow the provisions of the Soil Decree, the VLAREBO, the VLAREL, the CMA, this standard procedure, and the various codes of good practice when conducting the descriptive soil investigation and when drawing up the report. You are responsible for in-house and outsourced tasks.

Seek assistance from external experts if you determine that the complexity of the assignment exceeds your resources and capacities as a soil remediation expert.

This standard procedure does not affect the obligations you have as a soil remediation expert under other legal regulations.

1.6 QUALITATIVE, INDEPENDENT AND OBJECTIVE IMPLEMENTATION: INCOMPATIBILITY – MANAGEMENT MEASURES

1.6.1 Incompatibility

Legal basis: Article 53/5(1) of the VLAREL

↑ In the first place, you will have to assess for yourself whether you are able to carry out a specific assignment qualitatively, objectively and independently. This assessment will be carried out in accordance with the method laid down in this standard procedure. It is important that each staff member involved in providing the service, or the expert himself when it comes to a natural person, is aware of the preconditions for objective and independent implementation.

↓ There is a presumption of incompatibility for the soil remediation expert in the following cases:

- The client or the performer of the soil remediation works, or a person who holds a management position with the client or the performer of the soil remediation works, is the soil remediation expert him or herself or a board member, director or manager of the soil remediation expert.
- The client or the performer of the soil remediation works, or a person who holds a management position with the client or the performer of the soil remediation works, is a blood relative or relative by marriage of the soil remediation expert or a board member, director or manager of the soil remediation expert, in the direct line up to and including the second degree and in the collateral line up to and including the third degree.
- The client or the performer of the soil remediation works is a shareholder or belongs to a group of shareholders of the soil remediation expert that (jointly) directly holds/hold a participation of more than 5 % of the voting shares of the soil remediation expert.
- The total turnover for the client or associated companies is, on an annual basis, more than 50 % of the turnover of the soil remediation expert;
- The client or the performer of the soil remediation works is a direct or indirect creditor of the soil remediation expert for more than 35 % of the total debts of the soil remediation expert.

↓ This list is non-exhaustive, and is therefore without prejudice to the intended empowerment of the soil remediation expert regarding objective and independent implementation. You must verify in each specific case whether you are in a state of incompatibility. If you are not in a situation from the list, this does not mean that there can be no specific case of incompatibility.

1.6.2 Management measures

Legal basis: Article 53/5(2) of the VLAREL

↑ If, in a specific case, you consider that you are in a situation of incompatibility, you can only carry out the assignment if you take proactive management measures. These management measures will ensure independent and objective performance of the contract.

Management measures

↑ In case of incompatibility, an inspection is carried out by another soil remediation expert. If there is incompatibility due to blood or affinity, you ensure internal separation of functions.

Procedure

↑ You are required to describe the management measure in the report. You also include the report of the inspection by another soil remediation expert. The report must therefore contain an explanation and assessment of the management measure implemented.

Part 2: Implementation

2 ADMINISTRATIVE DATA

↑ You collect all the data to fill in the administrative part of the report (see Chapter 8.2).

2.1 PROTECTION OF PERSONAL DATA

↑ For natural persons, the report should contain personal information only in the administrative data section. After all, this is the only part of the report that will not be freely accessible.

↑ In the administrative part of the report, you assign a unique 'letter code' to the natural persons. In the rest of the report, you refer to this letter code. In this way, personal information remains protected.

2.2 IDENTIFICATION OF THE GROUNDS EXAMINED

↑ You collect information on all investigated soils where contamination has been detected. This concerns the following information:

- The cadastral identification of the land. Land that does not have a cadastral plot number is described by the address. The name of the soil (examples: Stationsstraat, Leuven-Mechelen canal) is clearly mentioned. A watercourse is described by the number of the VHA (Flemish Hydrographic Atlas) segment, in combination with the Lambert coordinates of the beginning and the end of the section being investigated.
- The details of the current user and operator, if different from the cadastre, that you learn about from a source other than the cadastre. In the case of compulsory co-ownership, enter the details of the association of co-owners ('VME') and, if applicable, of the property manager responsible for the management of the VME. The VME is always listed as a user. Is there no association of co-owners present? Then provide the details of the individual owner(s), user(s) and operator(s) that you learn about from a source other than the cadastre. Is the contamination linked to a specific plot? Indicate the operator and user of this plot. If you are conducting a descriptive soil investigation for a water bottom, indicate the watercourse manager.
- Also indicate since when the current owner, user or operator has been present at the research site in that capacity.
- Provide details of the relevant former owners, users and operators of the source plots. Also indicate the period during which that owner, user or operator was active.

↓ Did you only install a containment borehole on a site and no soil contamination was detected? If so, you should not include this soil in the table.

↑ The details of the VME, property manager, owners, users and operators must be correct and up-to-date. You must verify the authenticity, accuracy and completeness of the information you received regarding this.

2.3 ASSIGNING LABELS

↑ At least one label is assigned to each descriptive soil investigation report.

↑ The labels only pertain to the descriptive soil investigation conducted.

↓ Example: The descriptive soil investigation addresses contamination with mineral oil from garage activities. A dry cleaner is present on a spreading plot. The dry cleaning was not the reason for the descriptive soil investigation, and the contamination is not related to those dry cleaning activities. Only the 'garage and bodywork' label is therefore applicable.

↓ More information on the labels and their definitions can be found in Annex 2.

3 SITUATIONAL OVERVIEW

↑ You develop a situational overview to determine which relevant information is already available. You assess which additional data are needed to complete the descriptive soil investigation. Based on this evaluation, you develop a research strategy.

↑ Based on the situational overview, you should be able to start with a conceptual site model. You must pay attention to the destination, use, environmental characteristics, and hydrogeological characteristics of the research site. You also collect data on the origin and source of the contamination and the physicochemical characteristics of the contamination parameters.

↑ The site visit is an essential part of the situational overview.

↑ You evaluate the data from the relevant soil surveys. ⬈ Request the available investigations for this purpose.

↑ Do you identify an additional potential source of pollution at the level of the contaminated area? Indicate this in the report.

↓ While conducting the descriptive soil investigation, bear in mind that the situational overview may need to be adjusted due to progressive insight into the contamination situation. The collection of the data from the situational overview is often cyclical and involves multiple implementation steps (see also figure 1).

3.1 DESTINATION, USE AND ENVIRONMENTAL CHARACTERISTICS

↑ You will check the **destination** and the actual **use** of the land on which contamination is present. You will also examine whether changes in the destination or in the use of the research site are planned. If you are conducting a descriptive soil survey for a waterbed contamination, check whether there are any projects planned that have an impact on the waterbed contamination.

↓ The spatial data are relevant for the further assessment and evaluation of the results. The destination of a land indicates the destination according to the available urban development plans (spatial structure plan or implementation plan, general or special development plan, regional plan, etc.).

↑ You describe the **environmental characteristics** at the level of the contaminated area. ↓ The site visit is an important source of information for this. You take into account the spontaneous evolution of the contamination.

↘ The following elements may be relevant to the conceptual model:
- The layout of the site, such as existing buildings (with or without basement), paving, existing utility lines, etc. Also check whether changes or works are planned that will have an impact on the layout of the site.
- Topographical aspects, such as height differences within the research site, relief changes due to elevations or additions,...
- Presence of surface water, groundwater well, infiltration and drainage infrastructure that can affect groundwater flow, sewerage, underground infrastructures,...
- Possible receptors and routes of exposure:
  - Use of surrounding areas (nature, agriculture, industry, etc.). This includes the presence of ecologically valuable areas, vegetable gardens, livestock, etc.
  - Use of well water with a potential impact of soil contamination on human health.
- Other soil contamination in the environment that may have an impact on the pollution situation.
- The regional situation.
- Changed environmental characteristics since the previous soil survey.
- Potential other sources of contamination, including discharge points and transfer areas.
- A visual check of environmental characteristics during the site visit.
- Activities and (discharge) permits.
- Also gather information on the use, destination and relevant environmental characteristics of land that may be reached by further spreading.

3.2 GEOLOGICAL AND HYDROGEOLOGICAL DATA

↑ You compile the data on soil structure and groundwater. Take into account the properties and occurrence of the contamination.

↗ The following elements are essential:

- The soil structure up to the first separating layer (and deeper if relevant). Use not only publicly available information (such as 'Databank Ondergrond Vlaanderen' [Database of the Subsoil in Flanders] – DOV) but also the drilling descriptions from any previous soil investigations.
- The depth of the groundwater table.
- The location of the research site in water catchment areas or protection zones of type I, II, or III.
- The groundwater flow direction.
- The (authorised) groundwater abstractions that lie within the contamination contour or that may affect the contamination.

3.3 DETERMINE ORIGIN AND SOURCE

↑ You examine the history of the research site in order to identify the cause of the contamination and to substantiate the nature of the contamination.

↑ Review the historical research from previous soil investigations. ↗ Supplement it if necessary (based, for example, on newly acquired documents or recent facts).

↘ Couldn't a contamination be linked to a specific origin during previous soil surveys? Then conduct further research to ascertain the origin and location of the source of the soil contamination.

↗ On the basis of the data collected in the situational overview, determine which (private or legal) person can be linked to the contamination. Who was the operator of the operation that caused the contamination? Or who was the owner of the property that caused the pollution? Describe the available information and discuss ambiguities.

3.4 CHARACTERISTICS OF THE CONTAMINATION

3.4.1 General

↑ You should check what information is already available about the contamination. You determine the relevant physical, chemical and toxicological properties of the contamination. When drawing up the research strategy, you should take into account the influence of these properties on the spread of the contamination and the conduct of the risk assessment.

↓ The following elements may be relevant (not exhaustive):
- Information available on the contamination:
  - Conclusions from previous studies, precautions, restrictions on use, recommendations for use, residual contamination.
  - Has the pollution situation changed since the previous soil survey?
  - Was the contamination excavated or was the watercourse cleared?
  - Were earthworks carried out?
  - Was there any damage?

- Physicochemical properties of the contamination:
  - Is it a contamination with organic or inorganic parameters?
  - What speciation of heavy metals is present or expected?
  - What is the solubility of the pollution parameters?
  - Has a pure product been identified in the form of LNAPL/DNAPL?
  - Is there a presumption of pure product due to the presence of concentrations exceeding 1-10% of solubility?
  - Can volatile substances be present?
  - Can the substances break down into harmful or more mobile products?
  - Are they substances that are known to be often found together with other pollutants (co-contaminants)? Or do they contain additives?

↗ Are there any contaminants that are not the subject of the descriptive soil investigation but that are relevant for the research strategy or the evaluation? Describe these contaminants.

3.4.2 Non-standard parameters

↑ Is there no soil remediation standard available for the identified contamination in the VLAREBO? Then you must deduce the different test values. To do so, follow the methodology set out in 'De basisinformatie voor risico-evaluaties deel 1: Werkwijze voor het opstellen van bodemsaneringsnormen en toetsingswaarden, richtwaarden en streefwaarden' ['Basic Information for Risk Assessments Part 1: Methodology for drawing up soil remediation standards and test values, guide values and target values.'] This document can be found at www.ovam.vlaanderen.be.

↑ If test values are available, you must test against these values.

↑ You should develop the following test values:
- A test value 'guide value': The content of contaminants or organisms on or in the soil that allows the soil to perform all its functions without the need to impose a restriction.
- A test value 'soil remediation': The level of soil contamination at which if exceeded, serious adverse effects may occur to humans or the environment, having regard to the characteristics and functions of the soil.

↓ The test values have the same functionality as the guide value and soil remediation standard of standardised parameters.

3.4.3 Guide substances

↗ If several pollutants occur at the same place at the same time, it is not always necessary to analyse the samples for all the substances that occur. Is the concentration of the different pollutants well correlated with each other? Then you can make use of this correlation and thus limit the analysis package to the guide substance(s). For example, in the case of tar contamination, naphthalene can be used as a guide substance. Pay particular attention to the most mobile and most toxic substances.

↑ If the analyses are limited to the guide substances, you should build in sufficient controls to confirm the correlation of the guide substance with the other pollutants.

↑ The conclusion for the guide substance applies to all correlated parameters.

3.4.4 Specific parameters

↓ New pollutants are still being discovered in the environment whose risks to humans and the environment are not always well known. For known contaminants, there is increasing knowledge about the presence of additives or degradation products, or about the formation of other substances (e.g. speciation of metals). These substances may pose an additional risk that has not previously been addressed.

↑ If OVAM imposes additional research for this as a matter of policy, you will then apply that. This applies, for example, to:

- mercury contamination: You should pay attention to the possibility that volatile elemental mercury is present and to the speciation of this parameter in general.
- 1,4-dioxane: 1,4-dioxane was widely used in the past as an additive to trichloroethane. 1,4-dioxane is therefore always a relevant contamination parameter for a 1,1,1-trichloroethane contamination.

3.5 ADDITIONAL DATA FOR THE PRELIMINARY STUDY ON LANDFILLS

↑ You should conduct a comprehensive preliminary study for land with a landfill, if this has not yet been carried out during the exploratory soil investigation. You supplement the data from the exploratory soil investigation if necessary. For the necessary data, refer to the standard procedure for exploratory soil investigations.
In addition, investigate what the spatial needs of the environment are and how the landfill can address them. Keep this in mind during the risk assessment. Use the criteria for redevelopment and afforestation potential here (see Chapter 4.4.6).

4 RESEARCH STRATEGY

4.1 OVERALL OBJECTIVE

↑ The overall objective of the research phase is to gather information in order to develop the conceptual site model. This should provide a sufficiently reliable picture of the pollution and the risks to humans and the environment that may arise from the pollution. To determine the research strategy, you take into account the information you collected in the situational sketch.

↓ The following aspects are relevant:
- Gather additional information on geology and hydrogeology.
- Investigate the origin and source of the contamination.
- Determine the presence and characteristics of a core (zone) and the presence of any floating layer, dense layer or pure product.
- Determine the horizontal and vertical extent of the contamination in order to make a ruling for each soil concerned.
- Determine the indicative waste load.
- Underpin the conceptual site model and collect the necessary data for the risk assessment.

↓ When designing and implementing the research strategy, you should take the following into account:
- Apply the standard techniques of the CMA.
- Techniques other than standard techniques are permitted.
- You must prevent the research actions from causing damage.
- The works must be carried out safely.
- There are strategies for specific situations, such as asbestos, landfills or topsoils, if a decree descriptive soil investigation has already been carried out, water bottom and bank investigations, etc.
- For the risk assessment, both the most contaminated areas and the absence of contamination at certain locations are relevant. For example, by checking whether the topsoil above a contamination is contaminated.

4.2 STRATEGY FOR UNDERPINNING THE CONCEPTUAL SITE MODEL

4.2.1 Geological and hydrogeological surveys

↘ Additional research can further map the geological structure of the research site if necessary. Based on this, an estimate is made of the impact of the (hydro)geology on the potential spread of the contamination.

↓ The following elements may be relevant:
- the occurrence of permeable and less permeable sealing layers;
- clay lenses and other heterogeneities;
- the slope of the layers.

↘ In many cases, it is appropriate to draw up a detailed geological profile.

↗ You need to determine the direction of groundwater flow if groundwater contamination is present.

↘ You can determine the local groundwater flow direction of the phreatic groundwater based on the relative rising heights of the gauges. The monitoring tubes must be placed at a relevant distance from each other so that a correct determination of the groundwater flow direction and other groundwater flow characteristics is possible. You may level the monitoring tubes with respect to a fixed point on the site.

↘ The measurement of the groundwater level in these monitoring pipes must be carried out simultaneously. It may be useful to measure the rising heights several times a year in order to take into account the fluctuations over the seasons.

↘ You can perform slug tests or pump tests to determine the permeability of the aquifers at the research site.

4.2.2 The origin of the contamination

↑ For each contamination, check the origin.

↗ In the case of groundwater contamination, you will also investigate the presence of the contamination in the solid part of the earth.

4.2.3 The extent of pollution

↑ The aim of the containment is to map the extent of the contamination, to identify the contaminated land, and to make a statement for each land. The size is determined in the horizontal and vertical planes. You place the boreholes and the gauges in such a way that you can display the iso-concentration lines based on the analysis results.

4.2.3.1 Core

↑ At the core of the contamination, the most suspicious samples are analysed and the composition of the contamination is determined.

↘ Check whether there is a concentration gradient of contaminants in the core, both horizontally and vertically.
↑ You investigate the presence and extent of pure product, floating layers or bag layers.

↓ You take into account the specific characteristics of the contamination. You pay the necessary attention to the presence of a lubrication zone due to fluctuations in the groundwater table.

4.2.3.2 Iso-concentration lines

↑ For each parameter subject to investigation for which the remediation criterion for conducting a descriptive soil investigation was exceeded, determine the horizontal and vertical extent through the following iso-concentration lines:
- for standardised parameters: the guideline value and the soil remediation standard;
- for non-standardised parameters: the test value 'guide value' and the test value 'soil remediation';
- for sediment: the trigger value;
- a contour line for pure product, floating layer and dense layer if relevant.

↗ The samples from the solid part of the earth, groundwater and water bottom are taken in such a way that you can draw these iso-concentration lines. In the report, you should clarify on the basis of which data you determined this contour.

↑ Are you conducting a phased descriptive soil survey for a core zone? Then a contour that indicates the horizontal and vertical extent of the core zone is sufficient. In the report, you should clarify on the basis of which data you determined this contour.

↑ Is there any contamination originating outside the research site, and is it therefore not possible to determine the extent of the contamination? You draw an isoconcentration line to distinguish the contamination from these other elevated concentrations. In the report, you should clarify on the basis of which criteria you determined this contour.

↗ Are there multiple destination types at the research location? Then make a breakdown of the extent of the contamination per destination type based on the corresponding soil remediation standard.

↗ Will the use of the site definitely change to a destination type with a stricter soil remediation standard (e.g. by means of an approved spatial implementation plan or project developer plans)? If so, you must draw the iso-concentration lines for this potential use.

4.2.4 Data for risk assessment

↘ In order to support the risk assessment, it may be useful to identify which transport and exposure routes are significant by means of targeted measurements. For example, by leaching tests, air measurements, soil air measurements, determination of flux and displacement of the contamination load, drinking water measurements, crop measurements, samples of the topsoil, ecotoxicological tests, etc.

↗ For the risk assessment for mineral oil, perform an analysis according to the EPC-VPK method. The sample must be representative of both the solid part of the earth and the groundwater. Therefore, take a sample from

the core or take several samples if there are different cores. These analysis results are important for the risk assessment. You should therefore strive to perform this analysis in such a way that the results are representative of the maximum concentrations of the contamination. If the result of the EPK-VPK analysis is lower than the maximum measured concentration, the highest concentration can be converted according to the EPK-VPK distribution.

4.3 IMPLEMENTATION

↑ The CMA is applicable for the execution of the field work and analyses.

↓ Within the CMA, deviations are possible with a substantiated justification.

↑ Samples are analysed for contamination parameters, their relevant degradation products and additives.

4.3.1 Statement per plot

↑ The research strategy must allow for a statement to be made for each plot on which the contamination is present, in accordance with the objective of the descriptive soil investigation.

↓ The extent of the contamination determines for which plots a statement must be formulated. You should determine with sufficient substantiation whether contamination is present on the plot. Does a risk assessment show that there is serious soil contamination? Then it may be necessary to carry out targeted analyses based on the land use.

4.3.2 Research in the solid part of the earth

↑ In order to determine the extent of the contamination, soil samples are taken and analysed around the source of the contamination.

↗ For the containment:
- You analyse the soil layers adjacent to the contamination. This means that you analyse both the soil layer above and below the contamination.
- If there is a clear indication that the soil contamination is mainly concentrated in the top half metre of the soil profile, sample thinner layers (e.g. per 10 cm) for analysis. This is also important in the context of the risk assessment.
- In the case of minor contamination, at least one analysis in the context of vertical containment must be carried out. In the case of major contamination, you provide more analyses.

- If the contamination has penetrated into the depth, a horizontal containment at depth is also required. For contaminants that have an erratic dispersion pattern (e.g. chlorinated solvents), a horizontal cut-off in the solid part of the earth must be carried out at different depths.

↗ If the contamination can be contained sensorially, you can limit the number of analyses if the analyses confirm the sensory observations.

↑ In the presence of contamination in the solid part of the earth, you must determine the acidity and the content of clay and organic matter to calculate site-specific test values.

↓ These parameters are also relevant for the risk assessment and as a precondition for any soil remediation.

↗ When determining the acidity and the content of clay and organic matter, at least one analysis must be carried out per soil layer in which the contamination is present. ↘ The following elements are relevant:
- Depending on the risk assessment, it may be useful to determine these parameters in the other layers as well.
- Preferably perform the analyses on non-suspect and uncontaminated soil samples to prevent contamination from affecting the result of the analysis.
- When selecting the soil samples, ensure a good spatial distribution across the site to obtain a representative picture of the composition.
- Is there a clear pedological or lithological division at the research site? If so, you can apply a different set of clay, organic matter and acidity per sub-zone when converting the test values.

↗ Analysis of composite samples is permitted in research on atmospheric deposition and asbestos or if the purpose of the composite sample analysis is to determine the quality of a layer. For example, composite samples of specific filling layers during a trench investigation.

↗ Are there any indications that the groundwater may be contaminated? If so, at least two drillings per contamination core (one in the core and one downstream) must be continued into the groundwater and completed as a monitoring well. The groundwater is analysed for suspected substances. For large-scale contamination, provide more monitoring wells. If the groundwater is contaminated, further contain this groundwater contamination.

4.3.3 Groundwater investigation

↑ In order to determine the extent of the pollution, groundwater samples are taken and analysed around the source of the pollution.

↗ If there is a contamination in the groundwater, install both downstream and upstream monitoring wells to determine the extent of the contamination. Also perpendicular to the direction of flow, place monitoring wells for lateral containment. You take into account the structure of the subsurface and any preferential channels or zones with a local higher permeability.

↗ For the vertical containment, place monitoring wells with a deeper filter setting, both in the core and in the plume:

- If the contamination has penetrated into the depth, a horizontal containment at depth is also required. For contaminants that have an erratic dispersion pattern (e.g. chlorinated solvents), a horizontal delineation at different depths must be carried out.
- The vertical containment is repeated in the deeper filters until you can draw the iso-concentration lines.
- If the contamination has spread to an impermeable or poorly permeable layer, you should check whether a dense layer has formed on it.

4.3.4 Research techniques

4.3.4.1 Standard techniques

↑ Standard techniques are those included in the CMA. You must always state deviations from the CMA (e.g. when using existing monitoring wells) and justify them. You must indicate whether the obtained results are representative.

4.3.4.2 Other techniques

↓ It is permitted to use techniques other than the standard techniques.

↑ In order to assess against the standardisation framework, a validation of the results by standard techniques remains necessary.

4.3.5 Damage and safety

↘ When conducting the investigation, the techniques used must not aggravate the contamination situation, i.e. they must not cause additional contamination, increase the extent of the contamination or create new risks. It is always the intention to prevent additional damage.

↘ You must take measures to prevent damage to above-ground and underground utilities by the research actions. It is therefore advisable to clear drilling sites in advance of utilities and other structures that may be damaged by the research actions.

↓Depending on the land use, layout and accessibility, determine the appropriate investigation techniques for safeguarding pipes.

↑ Appropriate drilling and sampling techniques must prevent contamination from penetrating the underlying layer. You must always restore the sealing/separating layer so that the protective effect of the sealing/separating layer is maintained.

4.4 SPECIFIC POLLUTION SITUATIONS

4.4.1 Additions and top-ups

↑ You determine the scope and representative composition of additions and top layers within the research location. ↓ Were slags, fill soils or top layers applied over several plots? If so, you can limit the containment of the solid part of the earth to the research site of the exploratory soil investigation for which the remediation criterion was exceeded.

↗ You should also examine the influence of the filling or top layer on the underlying, adjacent layer and on the groundwater.

↑ If the groundwater is contaminated from the filling or top layer, you should also contain the groundwater contamination outside the research site of the exploratory soil investigation.

4.4.2 Asbestos

↑ For asbestos research, the 'Code of Good Practice – asbestos implementation BBO' applies.

4.4.3 PFAS

↑ For PFAS research, the 'Code of Good Practice, additional BBO guidelines for soil contamination with PFAS' applies.

4.4.4 Examination of waterbeds and banks

↑ For research on water bottoms, the Code of Good Practice on water bottom and bank investigations applies.

4.4.5 Atmospheric deposition

↑ Map the extent of pollution from atmospheric deposition in the horizontal and vertical planes.

↗ Take into account the history and activities on the source plot and the prevailing wind direction when determining the research strategy. This allows you to estimate the size of the area where atmospheric deposition is expected.
↗ You can use models to determine the sampling locations. The results must be analytically confirmed with soil samples. Ensure sufficient density of the samples. Take enough soil samples to allow a reliable interpretation.

↓ The sampling plan takes into account the expected spreading pattern (e.g. transects according to distance). Also consider lateral spread.

↗ Sample the topsoil separately and avoid dilution. You determine the sampling depth based on the properties of the soil, the pollutants, and the risks (e.g., 10 cm for risk in case of ingestion). You prefer to select

unpaved locations. Do not select locations where you know a new topsoil has recently been applied. Choose locations where interference with other sources or known contaminants is deemed minimal, if possible.

↗ You should verify whether the contamination has leached to the deeper soil layers or to the groundwater.

↓ You may analyse composite samples in zones with soils with similar characteristics and in samples of the same depth. Aim for zones of maximum 500 m² and for one subsample per 50 m².

4.4.6 Landfills

↗ When investigating landfills, consider the afforestation potential if this is relevant based on site-specific properties. If the afforestation potential is relevant, go through the 'Flowchart for afforestation of landfills/nature development'.
↓ In order to determine the redevelopment potential of landfills, it is appropriate to start from the landfill opportunities explorer. This tool can be found on www.stortplaatsen.be.

4.4.7 Excavation during the descriptive soil survey

What is an excavation during the descriptive soil investigation?
The contamination is excavated while conducting the descriptive soil investigation and under the guidance of a soil remediation expert.

If the excavation was not carried out according to these cumulative conditions, the excavation falls under Chapter 4.4.8.

4.4.7.1 Preconditions

↑ Contamination can be excavated during the descriptive soil investigation only under the following conditions:
- The excavation takes place under the guidance of a soil remediation expert.

- The client discusses the planned works with the owner(s) and the user(s) of the land(s) concerned. Prior to the start of the works, the parties involved must agree on the works to be carried out. The agreement must be in writing. The agreement also describes the relevant information about the works for each cadastral plot and contains the signatures of the parties involved. This written agreement does not need to be included in the report.
- The works are carried out in accordance with the rules of good workmanship and all legal provisions.
- The standard procedure 'Soil remediation works, final evaluation investigation and aftercare' applies. The philosophy of the Achilles care system is applied but a certificate is not required.
- The contamination in the solid part of the earth and groundwater must be contained both horizontally and vertically prior to the works. For a (mixed predominantly) historical contamination with asbestos, it is sufficient to perform the conditions for the depth of the holes to be dug as provided for under C.1 of strategy 8 from the standard procedure for exploratory soil investigations.
- The excavation takes place without dewatering. The use of a vacuum truck is allowed.
- Control samples are taken in accordance with the guidelines from the standard procedure 'Soil remediation works, final evaluation investigation and aftercare'.
- The excavation area is filled in accordance with the Regulation on Earthworks.
- The excavation is carried out with the intention of removing the contamination to below the guide value.

4.4.7.2 Site description

↓ Before and after the excavation, a site description is carried out. The site description must be made at the site where the works take place and also on the land where any negative impact can be expected.

4.4.7.3 Assessment framework

↑ If the contamination **was excavated to below the guide value** then no further action is needed.

↑ Was the contamination **not excavated below the guide value**? No further action is necessary if the following conditions are cumulatively met:
- You demonstrate through a thorough BATNEEC assessment that further removal of the soil contamination would entail unreasonably high costs. For the BATNEEC assessment, you start from the situation that existed before the excavation.
- A risk assessment indicates that the residual contamination does not pose a risk.

In that case, you clearly indicate whether usage advice is needed for this residual contamination.

↑ In all other cases, you must base the assessment on the initial assessment or the initially identified contamination.

If you are removing (mixed predominantly) historical asbestos contamination, it is sufficient that you meet the conditions and objectives included in the Code of Good Practice – asbestos – asbestos variant determination. In doing so, take into account the recommendations for use provided for in the Code of Good Practice.

4.4.8 Areas where soil contamination has been removed

↑ Did the removal occur for a reason other than that referred to in Chapter 4.4.7? Then you must sample the area where the contamination was present in such a way that you are able to apply the assessment framework of Chapter 4.4.7.3.

4.4.9 Phased descriptive soil investigation

↓ A descriptive soil survey can be carried out in different phases. Different cores or parts of research areas are then examined at different times. In this division, the conceptual site model for the entire research site should not be lost sight of.

↑ A descriptive soil survey can only be carried out in phases under the following conditions:
- There is a clear and logical distinction between the different parts that are addressed in phases, in particular in the following cases:
  - There are several contamination cores that can be distinguished spatially. This means that the cores do not merge into each other.
  - Within the same contamination, the plume zone and the core zone can be spatially distinguished.
- In the case of soil remediation, the phased implementation must not have a negative impact on the behaviour of other contamination cores that may need to be remediated at a later stage.

4.4.10 Monitoring

↓ Monitoring may be carried out if, on the basis of the available data, it is not possible to make an unequivocal statement about the possible evolution or spread of the contamination.

↑ If you carry out monitoring to determine the risk of spreading, the following conditions must be met:
- The descriptive soil investigation must not be carried out in the context of the transfer of land or the closure of a risk establishment.
- The possible risk of spreading is the only reason that there would be serious soil contamination.
- The contamination is historical, predominantly mixed historical, or is a contamination with a non-standardised parameter.
- The duration of the monitoring campaign shall be limited and shall not exceed five years.

↗ You should include the results of the monitoring in the descriptive soil investigation.

4.4.11 Pollution not originating at the research site, such as undercurrent, drift,...

↑ If additional analyses show that the contamination did not occur at the research site, then this contamination should not be further contained. You demonstrate in the descriptive soil study (or in a research report) that the contamination originated on another site.

↗ You identify and justify the source parcel or the source of the contamination. If there is already a soil investigation for this contamination, add the relevant plans to the descriptive soil investigation.

4.4.12 Naturally elevated concentrations

↑ For naturally elevated concentrations, refer to the standard procedure for exploratory soil investigations.

4.4.13 Point source pollution

↑ For point source contamination, refer to the standard procedure for exploratory soil investigations.

5 INTERPRETATION AND EVALUATION

↑ You collect, evaluate and interpret the data for a conceptual site model. You should verify whether the collected data are of sufficient quality and that there are no gaps preventing the objectives of the descriptive soil investigation from being achieved. For each plot, assess the need for remediation.

5.1 MONITORING AND EVALUATION OF ANALYTICAL RESULTS

5.1.1 Test framework

↑ You should test the analysis results against the relevant test framework. For standardised parameters, these are the standards from the VLAREBO; for non-standardised parameters, these are the calculated test values (see Chapter 3.4.2).

↑ Do you identify anomalous values for conductivity or acidity? Then check which parameters caused these anomalous values. ↗ Additionally, analyse the groundwater or the solid part of the earth for these suspect substances.

↑ Are there multiple destination types at the research location? Then make a classification per destination type based on the corresponding soil remediation standard.

5.1.2 Re-analysis in response to doubts

↑ Check whether the measured values correspond to the expected contamination based on the situational overview and the sensory observations during the fieldwork.

↑ If you have doubts about the correctness of an analysis result, please confirm this analysis result:

- ↗ **For the solid part of the earth**, a re-analysis can confirm or refute the first measurement. This re-analysis is carried out on a sample of the same soil sample within the shelf life of the sample according to the CMA. The evaluation of the analysis results is done on the basis of at least two analysis results giving rise to the same decision.
- ↗ **For groundwater**, the monitoring well can be re-sampled. The evaluation of the analysis results for this monitoring well is then done on the basis of at least two analysis results giving rise to the same decision. If

the results of the re-analysis are not conclusive, a third sampling and analysis will be conducted. There should be sufficient time (minimum 1 week) between the different re-sampling operations.
- ↗ **For the water bottom**, a re-analysis can confirm or refute the first measurement. This re-analysis is carried out on a sample of the same water bottom sample within the shelf life of the sample according to the CMA. The evaluation of the analysis results is done on the basis of at least two analysis results giving rise to the same decision.

5.2 DETERMINE THE VOLUME AND INDICATIVE POLLUTION LOAD OF THE CONTAMINATION

↑ For each medium, determine the volume of contamination within the iso-concentration line of the soil remediation standard (see Chapter 4.2.3.2). Also make an estimate of the pollutant load.
For substance groups, use the global contour for all exceedances of the soil remediation standard.

↗ Are there multiple destination types at the research location? Then make a breakdown of the volume and the indicative pollutant load per destination type based on the corresponding soil remediation standard.

↗ The **volume** is calculated using the following formulas:
- Volume of pure product: surface contour of the pure product, multiplied by the effective thickness of the pure product.
- Volume of contaminated soil: surface contour soil remediation standard, multiplied by the thickness of the contamination (both unsaturated and saturated) above the soil remediation standard.
- Volume of contaminated groundwater: surface contour soil remediation standard, multiplied by the thickness of groundwater contamination in the saturated zone above the soil remediation standard, and by the total porosity.
- Volume for waterbed: surface contour trigger value multiplied by the thickness of the contamination (sediment and solid part of the waterbed separately) above the trigger value.

↗ Calculate the **indicative volume load** using the following formulas:
- Pollutant load pure product: volume of pure product multiplied by the density of the product.
- Pollutant load of solid part of the earth (both unsaturated and saturated): arithmetic mean of the concentrations above the soil remediation standard, multiplied by the volume of contaminated soil and by the soil density.
- Pollutant load of groundwater: arithmetic mean of the concentrations above the soil remediation standard, multiplied by the volume of contaminated groundwater.

↓ Keep in mind that this is only an estimate based on a limited amount of data in order to form a global picture.

↓ In the context of a soil remediation project, a more detailed calculation can be made to weigh up the remediation variants.

5.3 NATURE OF THE CONTAMINATION

↑ You should determine the nature of the contamination for each contamination and each medium (new/mixed predominantly new/mixed predominantly historical/historical). The nature is justified.

↑ For mixed contamination, you should make, to the best of your ability, as accurate a statement as possible about the division of soil contamination into a proportion of new and a proportion of historical soil contamination. Justify this division.

5.4 RISK ASSESSMENT

↑ You should evaluate the risk of exposure of humans, plants and animals to the contamination, and of spreading the contamination to groundwater and surface water. You evaluate the risk in the current and potential future situation.

↑ The methodology for carrying out this risk assessment is described in the 'Code of Good Practice – DAEB methodology, risk assessment and risk-based remediation values'.

↑ You use the risk assessment to determine whether there is a serious soil contamination if there is a historical or mixed predominantly historical contamination or a contamination with a non-standardised parameter.

↑ The risk assessment must allow for the following assessment for each contamination:
- the need for remediation, for a historical or mixed predominantly historical contamination or for a contamination with a non-standardised parameter;
- the need for safety measures and precautions;
- the priority of soil remediation;
- the need for recommendations for use.

↗ Conduct the risk assessment for water bottom contamination in accordance with the guidelines of the Code of Good Practice 'Water bottom and bank investigations'. Pay sufficient attention to the risk assessment for the banks and floodplains.

↗ In the risk assessment for PFAS contamination, also apply the guidelines of the Code of Good Practice 'Additional BBO guidelines for soil contamination with PFAS'.

5.4.1 The conceptual site model

↑ A risk assessment starts with the completion of the conceptual site model and the source-path-receptor analysis.

5.4.2 Conducting the risk assessment

↑ You assess whether there is serious soil contamination for the following aspects:
- human exposure;
- ecological exposure;
- spread;
- policy adjustments.

↑ Only after going through these four aspects can you make a statement about the presence or absence of serious soil contamination and the need for further measures. Any other suspicion of serious soil contamination must be verified by means of additional evaluation or measurements (example: damage to civil engineering structures).

5.4.2.1 Human exposure

↑ The human exposure and human risks are calculated using an exposure model accepted by OVAM.

↑ You determine the current human risk based on the present contamination situation in relation to the current use, the current function of the location, the current terrain and environmental characteristics, the current hydrology,...

↑ You determine the potential human risk based on the potential (future) contamination situation in relation to likely or actual future changes in use, potential changes in the function of the site, the terrain and environmental characteristics, the hydrology, or due to an evolution in the contamination status. You determine the risks independently of the period within which they may occur. This period shall take into account realistic and representative possible future scenarios.

↑ You also determine whether humans may be currently or potentially exposed to the contamination by (further) spreading or by degradation, with the formation of more mobile or more toxic degradation products.

↗ There is a human risk if you answer 'yes' to one of the following questions based on modelling with the exposure model or with measurements:
- Is the risk index greater than 1?
- Is there an additional cancer risk (1/100,000)?
- Is the concentration in outdoor or indoor air greater than the permissible concentration in air?
- Is the measured or modelled concentration in the contact media (drinking water, crops, milk, meat, etc.) greater than the permissible concentration?

5.4.2.2 Ecological exposure

↑ You must undergo an ecotoxicological risk assessment if:
- there is visible damage to the environment;
- the research area is located in or adjacent to a nature reserve;

- ecotoxicological risks rather than human toxicological risks are to be expected (for contamination of the growing layer with copper and zinc in all destination types or with lead, chromium and mercury in destination type V);
- ecotoxicological risks are to be expected.

5.4.2.3 Risk of spreading

↑ Soil contamination poses a risk of spreading if receptors are negatively affected or if there is a risk that receptors may be negatively affected in the future. Spreading may occur through drifting or by spreading contamination to or within groundwater.

↑ The following risk types have been determined on the basis of the distribution mode, the receptors, and the types of contamination:
- There is mobile pure product present.
- Receptors are threatened or may be negatively affected in the future.
- In the case of a representative and realistic use of the soil, contamination in the solid part of the earth by leaching may in the future give rise to groundwater contamination that exceeds the soil remediation standards.
- A groundwater contamination can spread in the groundwater under the influence of the groundwater flow, causing the contour of the soil remediation standard to expand significantly horizontally or vertically (= an unstable groundwater status).
- Contamination in the topsoil of the solid part of the earth can cause soil contamination in the surrounding area due to drift.

5.4.2.4 Policy adjustment

↑ In the following situations, in terms of policy, there is always serious soil contamination and soil remediation is necessary:
- There is pure product present.
- The policy values for heavy metals, PAHs, or mineral oil in the solid part of the earth or for chlorinated solvents in groundwater have been exceeded.

↑ There is no serious soil contamination if:
- only concentrations below the soil remediation standard are detected;
- the detected concentrations for non-standardised parameters are lower than five times the limit of detection.

6 CONCLUSION

↑ In accordance with the objective of the descriptive soil investigation, you will provide a conclusion, per contamination and per medium, on the following:
- The origin and source of the contamination.
- Exceeding the guide value and the soil remediation standard.
- The nature of the contamination.
- Does the contamination give rise to soil remediation? What is the priority of soil remediation and are precautions or safety measures necessary in anticipation of soil remediation?
- Are any recommendations for use applicable?
- Ruling on core and plume zone in a phased descriptive soil investigation

↑ For each plot on which the contamination is present, issue a statement in accordance with the objective of the descriptive soil investigation.

6.1 NEED FOR SOIL REMEDIATION

↑ **For standardised parameters,** the need for soil remediation depends on the nature of the contamination. It is evaluated per parameter or per substance group for which the remediation criterion has been exceeded:
- **New soil contamination** and mixed predominantly new soil contamination: soil remediation is necessary if the soil remediation standard has been exceeded, with the exception of point source contamination (see Chapter 4.4.13).
- **Historical soil contamination** and mixed predominantly historical soil contamination: soil remediation is necessary if the risk assessment shows serious soil contamination.

↑ **For non-standard parameters**, soil remediation is necessary if the risk assessment shows serious soil contamination.

6.2 REMEDIATION PRIORITY

↑ If soil remediation is required, check whether measures are needed pending the soil remediation works. Also check the priority of the soil remediation.

↑ Based on the risk assessment, you estimate to what extent the current and potential receptors are threatened and over what period of time.

↑ If a threat cannot be ruled out in the short term (within two years), the contamination is classified under ‘priority 1’. The remaining contaminants become ‘priority 2’. Determine the priority for each contaminant for which soil remediation is required.

↑ Will there be phased remediation? If so, you can propose a different remediation priority for different contaminants.

6.2.1 Current and potential receptors

↑ When determining the remediation priority, consider at least the following receptors (see risk assessment):
- human beings;
- private or public water abstractions for drinking water and industrial abstractions for high-quality use (e.g. process water in the food industry);
- water abstractions not intended for drinking water or high-quality use (e.g. irrigation water);
- surface water;
- civil engineering structures (buildings, underground infrastructure other than drinking water pipes, etc.);
- animals (pets, livestock, birds, etc.) and plants (trees, crops, etc.);
- biotic organisms in ecologically valuable areas.

↑ Evaluate both the current use and scenarios with possible, realistic changes to the current use function or layout of the site. For the changed situation, consider scenarios that may occur within two years. For an investigation of a water bottom, take into account (planned) projects that change the water management.

6.2.2 Negative effect within a period of two years

↑ In these situations, you should always classify the contamination under ‘priority 1’ (non-exhaustive list):
- Safety is threatened (e.g. explosion hazard).

- Human well-being is effectively threatened by direct or indirect human exposure to the contamination, inhalation of gases or vapours, ingestion of soil particles and dust, ingestion via crops, dermal contact, ingestion via contaminated drinking water through permeation of drinking water pipes or by degradation of an extraction.
- There is a demonstrable, measurable nuisance (e.g. odour nuisance, skin irritation, ...).
- Pollution threatens private or public drinking water extraction, industrial groundwater extraction, or other extraction and potentially prevents its further exploitation.
- The contamination threatens a protection zone of a drinking water extraction.
- Damage to civil engineering structures resulting in damage to buildings or other infrastructure cannot be ruled out. This damage poses a safety risk.
- The contamination threatens the surface water quality with a measurable effect.
- The contamination has negative effects on animals, plants, and organisms in ecologically valuable areas. There is clearly visible damage (e.g. mortality, disease, reduced growth or production, ...) or there are other potential or measurable toxicological effects.

↑ If there is a real, current threat, you propose security measures or precautions (see chapter 6.3).

6.3 SAFETY MEASURES AND PRECAUTIONS

6.3.1 General

↑ Based on field observations, analysis results, risk assessment, etc., do you find that safety or precautionary measures are needed to temporarily protect humans or the environment against the dangers of contamination? Send these findings to OVAM. Justify your position and indicate whether the measures should be implemented immediately and pending the soil remediation works.

↑ Evaluate the need for precautionary or safety measures during the entire process of conducting the soil investigation and immediately after each receipt of new analysis results or new observations.
↑ In case of immediate danger (e.g. an explosion hazard), **safety measures** are needed. Report this immediately to OVAM. Are the measures temporary and pending further investigation or soil remediation works? Then propose **precautionary measures**.

↗ Report the need for precautionary measures to OVAM within a period of 30 days after the determination. The operators, users or owners of the contaminated land can propose precautionary measures to OVAM under your direction.

↗ Use the methodology of Chapter 6.3.2 to assess whether there is evidence of a current risk due to direct human exposure. You should not report this assessment if there is no need for action, precautionary measures or safety measures.

↗ A contamination in which, according to this methodology, there is no evidence of a risk due to direct human exposure

- may still pose a risk of spreading or an ecotoxicological risk;
- it may therefore still be necessary to take swift measures to, for example, prevent spread, protect vulnerable nature, prevent degradation of surface water, limit nuisance and disturbance, etc.;
- in addition, there may be other elements that lead you to consider that a human risk may be present, for which precautionary measures are necessary, such as:
  - pollution present at ground level in concentrations where direct contact may have harmful effects on human health;
  - the presence of contamination that prevents the site from performing its current function.

6.3.2 Methodology for precautionary measures due to possible human exposure

↓ This methodology has a **signal function** and is a **tool** for checking for indications of risk due to human exposure to soil contamination, but **does not replace the global assessment of the situation by a soil remediation expert**. This methodology is therefore not a fully-fledged risk assessment, as referred to in Chapter 5.4 Risk assessment. The methodology is a tool to easily and quickly identify a potential risk due to human exposure that requires precautions.
The thresholds and distances used are indicative. The final assessment is in your hands.

6.3.2.1 Step 1: receptors and exposure

↗ Check whether at least one of the following receptors or exposures is present:
- Direct human contact is possible with chemical products (such as oil, chemical products, cyanide-containing soil, etc.).
- There is an indoor space at a short distance (indicative distance: within 20 m).
- There is a drinking water extraction area, a protection zone, a well for drinking water or a well for watering vegetable gardens at a short distance (indicative distance: within 20 m).
- There is a playground, a vegetable garden or a poultry run at a short distance (indicative distance: within 20 m).

Check this at every fieldwork phase. For example, in the case of the containment of contamination, due to the expansion of the research area, a vegetable garden may be present in the vicinity at a later stage, whereas this was not the case at an earlier stage.

Are none of these receptors or exposures present? Then you can decide that no precautions are necessary due to possible human exposure and continue to work on the (decretal) soil investigation.

6.3.2.2 Step 2: Clear indication of serious soil contamination (DAEB)

↗ Is at least one of the above receptors or exposures present? If so, check whether there is a DAEB for the contamination near the relevant receptors. The SGEI methodology allows you to make a rapid risk assessment and to take into account additional situation-specific arguments. This SGEI methodology can also be applied to new pollution. The DAEB methodology is described in the Code of Good Practice 'DAEB methodology, risk assessment and risk-based remediation values'.

If there is no DAEB, you may decide that no precautionary measures are necessary due to possible human exposure.

6.3.2.3 Step 3: indications of a risk due to human exposure

If there is an SGEI, go through the schedule below for the receptor(s) or exposure(s) and contaminants relevant to your situation.

↗ Here you should make a distinction between:

- **Direct actions**: simple actions that can be taken to limit direct contact with the contamination such as communication to residents regarding the use of vegetable gardens, groundwater, etc., or restricting entry into the contaminated area by closing it, etc. You do not report these direct actions as precautionary measures. However, you do report the direct actions taken to limit exposure in the report.
- **Precautions**: measures necessary to limit exposure if:
  - direct actions are not sufficient to limit direct contact;
  - the operator, user or owner does not take any direct actions;
  - no access is obtained to carry out the necessary actions;
  - a specific permit is required in order to be able to take measures.

  You should report the precautionary measures to OVAM.

Receptor concerned		Measurement	Testing	Measurement	Testing	Decree
1. Permanent direct human contact possible with chemical product/ferruginous earth (cyanide-containing soil)		n/a	n/a	n/a	n/a	Immediate actions/precautions needed.
2. Volatile product in the soil, below or less than 20m from indoor areas		Carry out air measurements in indoor air	> TCL[2] or Limit value/VF[3]			Immediate actions/precautions needed.
			< TCL[2] or Limit value/VF[3]			No precautions necessary due to human exposure.
3. Drinking water abstractions, protection zones, wells for drinking water or wells for watering vegetable gardens at relevant depths. (not applicable for non/very poorly soluble parameters such as asbestos, PAH,...)	Within the contaminated area	Analyse the drinking water/well water	> drinking water standard			Immediate actions/precautionary measures needed.
			< drinking water standard			No precautions necessary due to human exposure.
	< 20 m from the contaminated measuring point	Check whether there is already an investigation at the level of the abstraction, protection zone or water well. If not: analyse the groundwater at the level of the identified contamination and implement the DAEB groundwater methodology	SGEI	Analyse the drinking water/well water	> drinking water standard	Direct actions: Communicate to the parties concerned to limit exposure pending further investigation or soil remediation works. Safeguards: Evaluate whether other measures are also appropriate.
					< drinking water standard	No precautions needed due to human exposure.
			No DAEB			No precautions necessary due to human exposure.
4. Unpaved poultry run, playground, vegetable garden	Within the contaminated area	Analyse the solid part of the earth at the level of the poultry run, playground, vegetable garden	> (test value) BSN type III			Direct actions: Communicate to the parties concerned to limit exposure pending further investigation or soil remediation works. Safeguards: Evaluate whether other measures are also appropriate.
			< (test value) BSN type III			No precautions necessary due to human exposure.
	< 20 m from contaminated area	Check whether there is already an investigation at the level of the poultry run, playground or vegetable garden. If not: test the concentration and analyse the solid part of the earth in the contaminated area against 15 x BSN type III	> 15x (assessment value) BSN type III	Analyse soil at the level of the poultry run, vegetable garden, playground	> (test value) BSN type III	Direct actions: Communicate to the parties concerned to limit exposure pending further investigation or soil remediation works. Safeguards: Evaluate whether other measures are also appropriate.
					< (test value) BSN type III	No precautions necessary due to human exposure.
			< 15x (test value) BSN type III			No precautions needed due to human exposure.

Table 1: indications of risk due to human exposure

[21] Definition/rules of thumb for recognising a volatile product: see code of good practice DAEB, risk assessment and risk-based remediation values
Nuance is possible, see paragraphs under the table
[3] VF: safety factor

Permanent direct contact with chemical product

If people can come into direct contact with chemical product (such as oil, pools of chemical products, etc.) then advise the operator, user or owner of the contaminated land to take immediate actions under your direction to prevent this contact. This can be done, for example, by:

- cordoning off the area and installing warning signs or fences to prevent unauthorised access;
- covering the soil;
- excavating the topsoil;
- removing pure product with a vacuum truck;
- informing and involving the relevant parties (such as the owner, user, government, local residents) about the situation and the actions taken;
- …

If, after these direct actions, direct contact with chemical product is still possible, evaluate the precautionary measures. Report these to OVAM.

Volatile product in the solid part of the earth or groundwater below or less than approximately 20m from an indoor area

Is it an unknown or a volatile product and is there an interior space in the vicinity (indicative distance: within 20 m)? Then conduct an air measurement in this indoor space. Test the results of this measurement against:

- The allowable concentration in air (TCL), if available.
- If no TCL is available, you can indicatively test against the limit value from the Codex on Well-Being at Work divided by a safety factor.

The safety factor depends on the H-statements for the component concerned. You can find the H-statements on the safety data sheet of the component. Indicatively, you should use the following safety factors (VF):

- VF=100, if none of the H-phrases from Table 2 is applicable.
- VF=500, if one or more H-phrases from Table 2 are applicable.

H-phase	Meaning	Note
H330	Fatal if inhaled	/
H331	Toxic if inhaled	/
H332	Harmful if inhaled	/
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled	/
H335	May cause respiratory irritation	/
H340	May cause genetic defects <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.	If inhalation is a relevant route of exposure
H341	Suspected of causing genetic defects <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.	
H350	May cause cancer <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.	
H351	Suspected of causing cancer <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.	
H360	May damage fertility or the unborn child <state specific effect if known> <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.	
H361	Suspected of damaging fertility or the unborn child <state specific effect if known> <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.	
H370	Causes damage to organs <or state all organs affected, if known> <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.	
H371	May cause damage to organs <or state all organs affected, if known> <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.	
H372	Causes damage to organs <or state all organs affected, if known> through prolonged or repeated exposure <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.	
H373	May cause damage to organs through prolonged or repeated exposure <or state all organs affected, if known> through prolonged or repeated exposure <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.	

Table 2: H-phrases

The TCL and the safety factors for limit values from the Codex were chosen based on a conservative approach and to enable rapid indicative testing. Is this value exceeded? You can always refine and determine more specific test values based on situation-specific elements or additional measurements. The TCL is derived from lifetime exposure.

If you conclude that there is evidence of a risk due to human exposure, advise the operator, user or owner of the contaminated land to take immediate actions under your direction. This can be done, for example, by:

- Evacuate the room in case of risk from inhalation;
- additionally ventilating the indoor space;
- carrying out additional reference measurements in indoor and outdoor air;
- extracting soil air;
- monitoring concentrations in indoor air or groundwater;

- …

You always evaluate whether additional precautionary or safety measures are necessary.

Drinking water abstractions, protection zones, wells (at relevant depth) for use as drinking water or for watering vegetable gardens

Unless the contamination consists of insoluble to very poorly soluble parameters, conduct additional research:
- Is the drinking water abstraction, protection zone or well located less than approximately 20 metres from the contamination? And based on an analysis of the solid part of the earth, have you decided that there is a DAEB? Then also analyse a sample of the groundwater.
- If there is a DAEB for groundwater, sample the drinking water or well water concerned.
- Is the drinking water abstraction or well located within the known contaminated area? Then immediately sample the drinking water or the well water.

You should test the result of the drinking water analysis against the drinking water standard. If no drinking water standard is available, calculate a standard according to the 'Basic Information for Risk Assessments. Methodology for drawing up soil remediation standards and test values, guide values and target values'.

If you conclude that there is evidence of a risk due to human exposure, advise the operator, user or owner of the contaminated land to take immediate actions under your direction. This can be done, for example, by:
- to inform and involve the relevant parties (such as the owner, user, government, and local residents) about the situation and the actions taken;
- discouraging or discontinuing the use of groundwater as drinking water or for the vegetable garden pending further investigation.

You always assess whether additional precautionary or safety measures are necessary.

Unpaved poultry run, playground, vegetable garden
Is there a poultry run, vegetable garden or playground located less than approximately 20 m away? If so, check whether the contamination has already been investigated.
Has an investigation not been conducted yet?
Check whether 15 times the soil remediation standard for a destination type III (15 x BSN type III) is exceeded.
Is 15 x BSN type III exceeded in the vicinity of the poultry run, vegetable garden or playground? If so, also sample the solid part of the earth from the poultry run, vegetable garden or playground.

Is the soil remediation standard for a destination type III exceeded in the poultry run, vegetable garden or playground? If so, advise the operator, user or owner of the contaminated land to take immediate actions under your direction. This can be done, for example, by:
- informing the parties concerned to limit exposure pending further investigation, recommendations for use or soil remediation;
- discouraging or discontinuing the use of vegetables and eggs from the garden pending further investigation;
- covering or cordoning off the affected area;
- excavating the (topsoil of the) affected area;
- remove the source of the contamination;
- …

You always evaluate whether additional precautions or safety measures are necessary.

6.3.2.4 Decree

↗ Are there any indications of the presence of a risk due to direct human exposure? If so, advise the operator, user or owner to take direct actions to mitigate the potential risk.
If the direct actions are not sufficient to limit exposure or if the operator, user or owner does not take direct actions, report the precautions to OVAM. Even if a specific permit is required to take measures, you must report precautionary measures to OVAM.

6.4 RESTRICTIONS ON USE

↓ Restrictions on use are imposed if the public interest is harmed or in cases of serious risks due to contamination that cannot be remediated by BATNEEC. These are, in principle, perpetual.

↓ Restrictions on use can therefore in principle only be imposed after a (limited) soil remediation project following a BATNEEC assessment.

6.5 INSTRUCTIONS FOR USE

6.5.1 General principles and guidelines

What are recommendations for use?
Recommendations for use provide information and advice on the possibilities for using contaminated land. This takes into account use situations or operations which can reasonably be expected to occur within a period of 5 years.

Recommendations for use cannot replace safety or precautionary measures. They should not be used to avoid soil remediation, but they may be applicable pending soil remediation works.

Recommendations for use mainly have a signalling function. Contrary to restrictions on use, they do not entail any obligations.
Use recommendations are mentioned on the soil certificate to sensitize the acquirer of land or other parties involved and to make them aware of the possible impact of the contamination.

↑ The need for recommendations for use is evaluated for any contamination that exceeds the guide value in the solid part of the earth or that exceeds the soil remediation standard in groundwater.

↓ There are two situations where usage advice may be needed:
- The risk assessment shows that the contamination poses an actual or potential risk. Pending soil remediation, formulate recommendations for use to manage this risk.
- The risk assessment shows that the contamination does not present an actual or potential risk on the basis of the existing situation. In the future, there may still be use situations or operations that could have an impact or consequence. If so, recommendations for use clarify which measures or actions might be necessary.

↓ Recommendations for use mainly have a signalling function and aim to:
- Provide correct information to the parties concerned.
- Raise awareness among the parties concerned and inform them of the points of attention, consequences and risks of contamination in the event of a change in land use.

- Identify possible risks. In case of doubt about a change in land use, a new risk assessment can then be carried out.
- Proactively provide insight into the impact of existing contamination when planning a new use or changing the current use.
- Create a tool to incentivise risk-based soil remediation while achieving optimal land use without additional risks.

6.5.2 Possible recommendations for use and rules of thumb for allocation

↑ Recommendations for use are always linked to certain operations in contaminated areas or on contaminated land. You take into account operations that may reasonably be expected to occur within a period of 5 years. An exception is earth works: recommendation for use GA1 may also be assigned if no earth works are foreseen within 5 years.

↓ Error: Reference source not found (Annex 3) contains the possible recommendations for use and the main rules of thumb for assigning them.

↘ Use recommendations are strongly linked to the routes of exposure and dissemination from the risk assessment that determine the potential risk. If a certain route (e.g. removal of paving, vegetable garden) does not pose a risk, you should not assign any recommendations for use for this.

↑ If there is a potential risk in a realistic scenario then you decide that there is a need for remediation and recommendations for use are not sufficient.

↓ You must also be aware of use situations and operations that the risk assessment does not take into account or that were not yet known when the descriptive soil investigation was drawn up. For example:
- Exposure while working on contaminated land during the construction of utility lines or when excavating a basement.
- A garage workshop in a residential area changes the land use. In the future, the land can be used again for residential purposes.
- A change of destination to a more sensitive use compared to the current destination when redeveloping an industrial site into a residential area.

↑ You should assign the recommendations for use with their code based on the available data on the land and the contamination. Your overview of the formulated recommendations for use provides a non-exhaustive picture of the possible consequences in the execution of works or in the event of changes in the function or destination of the land.

6.5.3 Repealing recommendations for use

↓ Recommendations for use remain valid until a soil remediation expert in a (new) descriptive soil investigation or in a final evaluation investigation justifies that they are no longer necessary.

Are the recommendations for use no longer up-to-date in the current situation, for example because the land use or the contamination situation has changed? If so, you can justify deleting the recommendations for use or imposing additional ones.

If it appears that the additional measures imposed are no longer up-to-date in the current situation, it may be justified to revise the additional measures.

Part 3: Reporting and data transfer

7 REPORTING AND DATA TRANSFER - GENERAL

↑ The report on the descriptive soil investigation consists of:
- the digital report in a PDF file;
- the alphanumeric data in an XML file;
- the spatial data in a shapefile, if contamination is present.

↑ Provide this data to OVAM via the e-portal for soil remediation experts. More information on how the e-portal works can be found at www.ovam.vlaanderen.be.

↓ The report of the descriptive soil investigation is only submitted to OVAM when the report appears in the list of 'Forwarded assignments'.

↓ The e-portal is made available by OVAM for the submission of digital data. OVAM is under no circumstances responsible for the loss of data due to the use of the e-portal or for the temporary non-functioning of the e-portal.

8 THE DIGITAL REPORT

8.1 GENERAL

8.1.1 Title of the digital report

↑ Use the following **standard title**: 'Descriptive soil investigation: *street, number and municipality of the research site*';

↑ For a **Phased Descriptive Soil Examination**:
- prefix the default title with 'phased';
- after the standard title, insert '*subject* part', where the subject is the part of the contamination that you describe in the soil investigation.

↑ For an **amendment to the descriptive soil investigation**, prefix the default title with 'amended'.

↑ When compiling the title, respect this order: 'amended' – 'phased' – 'standard title' – '*subject* part'.

8.1.2 Compilation of the digital report

↑ You divide the digital report into several PDF files:
- one PDF – administrative data;
- one PDF – non-technical summary;
- one PDF – report (you can split the file if it is too large to upload);
- one PDF – summary per land;
- one or more PDF – maps;
- one or more PDF – annex.

↓ You can supplement the digital report with a PDF – important information.

↑ If you add a PDF file to the e-portal, select the appropriate document type.

↑ Technical requirements for the PDF files:
- Each file must be a text PDF. This means that the PDF file can be printed and the content can be selected and copied. It must not be possible to select and copy the contents of the map material and the attachments.
- The report file includes an interactive table of contents with hyperlinks, allowing for quick navigation through the file.

8.2 PDF – ADMINISTRATIVE DATA

↑ Bring the personal information together in a table in the PDF file 'PDF – administrative data'.

↓ The personal information will not be freely accessible.

8.2.1 Table of administrative data from the report

↑ Summarise the administrative data from the report according to Table 3.

Report details Title: Report reference: Report date:	
Research site Street and number (or description): Postal code: Merged municipality: Sub-municipality:	

Client Name: Address: Telephone No.: Email: Capacity: **Contact person** Name: Telephone No.: Email: **Contact person on site** Name: Telephone No.: Email:	□ owner □ user □ operator □ acting on behalf of the owner/user/operator □ other: ……
Soil remediation expert Name of contact person: Telephone No.: Email: Name of quality manager: Email of quality manager:	
OVAM file number	
Label(s)	□ asbestos □ atmospheric deposition □ brownfield □ dry-cleaning/laundry □ drug-related □ garage and bodywork □ gasworks □ agriculture and horticulture □ compulsory co-ownership □ owned by local authorities □ owned by the Flemish Government □ Industrial Emissions Directive □ private individual □ PFAS □ promaz CSC □ promaz CSO □ promaz CSW □ promaz PSO □ promaz PSW □ school □ fuel oil tank for heating □ landfill

	□ petrol station □ university □ transport – goods and persons □ water bottom □ water catchment area □ not applicable
Environmental damage	□ Environmental damage has been identified. □ No environmental damage has been identified.

Table 3: administrative data from the report

↑ In the case of compulsory co-ownership, summarise the details of that co-ownership according to Table 4.

Compulsory co-ownership details Form of compulsory co-ownership: Since when has compulsory co-ownership been present?	 □ apartment building □ business centre □ other: ……
Administrator of the compulsory co-ownership Name: Address: Telephone No.: Email: Capacity:	 □ property manager □ association of compulsory co-owners

Table 4: administrative data from the compulsory co-ownership

8.2.2 Table identifying the land concerned

↑ Describe all land where contamination has been detected according to Table 5.

Municipality.	Section	Lot number	Address	Municipality	Person (owner, user, operator)					
					Period		Type[3]	Name	Address	Letter code
					From	To				

Table 5: identification of the land concerned

↑ Discuss any cadastral changes to one or more plots of land after the assessment of the previous soil investigation.

↗ Indicate which (private or legal) person caused the contamination.

[3] Indicate whether the person concerned is the owner (E), user (G) or operator (EX). Mark the current owner and the current user or operator in bold.

8.3 PDF – NON-TECHNICAL SUMMARY

↑ Concisely summarise the soil investigation in the PDF file 'PDF – non-technical summary'.

↓ The non-technical summary should enable people who are not familiar with soil matters to gain an understanding of the pollution situation and its impact. Avoid using technical terms. Abbreviations should be avoided or explained in the non-technical summary.

↑ The following information is relevant to mention:
- The contamination investigated and its nature.
- A concrete description of the risks posed by this contamination.
- The need for soil remediation and its priority.
- The need for precautionary or safety measures.
- The need for recommendations for use, described using the codes and standard phrases from Error: Reference source not found (Mention the link to the informative illustrations on the OVAM website). You can use a table listing the standard phrases of the listed codes.

↑ You should provide this information **per cadastral plot** for both the source and spreading plots. You may combine plots with the same statements.

↓ In the non-technical summary, only mention information that is also covered in the report.

8.4 PDF REPORT

↑ You should include at least the following chapters in the PDF file 'PDF – report':
- introduction;
- situational overview;
- determination of the research strategy;
- results of field and laboratory investigations;
- evaluation of the data collected and a risk assessment;
- conclusion:
- Declaration and signature.

↓ The report should demonstrate how you developed the research strategy to arrive at a conceptual site model.
The reader of the report must be able to verify the decision-making based on the information provided.

8.4.1 Chapter 'Introduction'

↑ You give a concise description of the following points:
- the location of the research site;
- reason and objective of the descriptive soil investigation;
- the version of the standard procedure used;
- the descriptive soil investigation is a phased or fully descriptive soil investigation;
- for a modified descriptive soil study: an overview of the additions or comments.

↑ Is the soil investigation a phased descriptive soil investigation? Then complete the introduction with the following information:
- You describe the part of the research site, the parameters, or the contamination core that was already investigated in a previous phase.

- If OVAM has already made a decision on a previous phase, refer to it.
- Describe which part is the subject of the current descriptive soil investigation.
- Justify the phased approach.

8.4.2 Chapter 'Situational overview'

↑ Describe the data you collected during the situational overview. If the results of the research phase refute the information from the situational overview, mention this.

Site visit

↑ Explain the relevant observations from the site visit. Also refer to the photos you include as an attachment.

Destination, use and environmental characteristics

↑ Indicate the destination and actual land use for each of the plots of land on which soil contamination is present. Also state planned changes in destination.

↑ You describe the environmental characteristics at the level of the contaminated area.

Geology and hydrogeology

↑ You compile the data on soil structure and groundwater.

↘ You can use Table 6.

Depth (m-bgl)	Texture	Heterogeneity and stratification	Stratigraphy [4]	Permeability		OM (%)	Clay (%)	Comments
				Decimal (m/d)	Description			
0 - 0.5	Sand	Heterogeneous debris present		-	Good	-	-	
0.5 - 5	Loamy sand	Homogeneous		0.001	Moderate	2.5	15.5	Glauconite-containing
5 - 9	Loamy sand	Heterogeneous layering: clay lenses and peat layers		-	Moderate-poor	-	-	Locally up to 3 cm peat
9+	Clay	Homogeneous		-	Impermeable	-	-	Closing, lower boundary of the aquifer
The permeability was determined via								
Depth of the groundwater table:								
Groundwater flow direction:								

Table 6: Overview of hydrogeology (example)

Conclusions of previous soil surveys

↑ You provide a summary of the phases already carried out and an evaluation of the current contamination situation at the level of the contamination based on previous soil surveys and soil remediation. You provide a list of the reports you used for this purpose.

History, origin and source

[4] Stratigraphic name as used on the most recent geological maps.

↑ You provide an overview of the historical research carried out. You should mention the relevant parts of the historical research of previous soil investigations and supplement this with the additional data that you collected in the descriptive soil investigation.
↑ Include the following data if they occur at the level of the contamination or can be related to the contamination:
- A list of current and former potential sources of pollution.
- The details of the current and former storage tanks listed in Table 7. ↘ You can use Table 7 or you can describe the data in another way.
- For landfills: the additional data from the comprehensive situational overview.

Tank number	Zone	Contents (l)	Product	Type (B/O)	Base depth (m)	Installation year	Wall (E/D)	Leak detection (Yes/No)	Overfill protection (Yes/No)	Year of last leak test	Boiled (Yes/No)	Paving	Year officially out of use

Table 7: overview of storage tanks

Legend Table 7:
- Zone: : description of the suspect zone.
- Product : liquid that is or was stored in the tank. Also mention amended content.
- B/O : above ground or underground.
- Base depth : the depth of the base of the underground tank relative to ground level.
- E/D : single-walled or double-walled.
- Paving : type of surface present (concrete, unpaved, liquid-tight,...).

Characteristics of the contamination

↑ For standardized parameters, a concise description of the most important characteristics is sufficient to support the development of the research strategy. Justify the possible use of guide substances.

↗ For the identified non-standardised contamination parameters, describe the following:
- physical, chemical and toxicological properties;
- the conversion or degradation schemes;
- the risks to humans and the environment;
- the influence of these properties on the distribution;
- the guide substances used (if applicable).

↑ For non-standardised parameters, indicate the corresponding test values (guide value and soil remediation). Briefly describe how you calculated these test values.

8.4.3 Chapter 'Determination of the research strategy'

↑ You should clarify the research strategy you followed to build and complete the conceptual site model.

↓ When describing the research strategy, you take into account the different aspects of a descriptive soil study:

- geological and hydrogeological surveys;
- determination of source and origin;
- impact of the characteristics of the contamination on the conceptual site model;
- determination of the extent and evolution of pollution;
- data for risk assessment.

↑ Did you use alternative methods or techniques? Then discuss the technique and provide a summary of the principle and the way the results are interpreted. Also describe which standard techniques you used to validate the results.

↑ If you developed a research strategy for a specific contamination situation, discuss it.

↑ If you performed an excavation during the descriptive soil investigation, include the following elements:
- a proper description of the works carried out and their impact on soil quality;
- a description of the state of contamination after the excavation;
- the details of the contractor who carried out the excavation works;
- the volume of excavated soil;
- the volume of residual pollution;
- where appropriate, a BATNEEC assessment for further removal of residual contamination;
- where appropriate, a risk assessment for residual contamination.

8.4.4 Chapter 'Results of field and laboratory investigations'

↑ You should report the results of the field and laboratory investigations in sufficient detail so that the investigation is reproducible.

8.4.4.1 Field investigation

↑ You should include at least the following information:
- the unique name of the measurement site (this is the link between the subsurface description and the analytical results);
- the plot and location of the measurement (for boreholes and monitoring wells, this is the X and Y coordinate according to the Lambert72 coordinate system with a maximum deviation of 1 metre and the Z coordinate read from the topographic map);
- the type of measurement (borehole, monitoring well, asbestos sample, air measurement, sounding, control sample, water bottom sample, etc.);
- the depth of sampling;
- date of performance;
- the performer of the measurement;
- the technique used;
- field observations (such as sensory contamination and the depth at which it occurs, presence of floating layer and its thickness, etc.);
- field measurements (for groundwater sampling, this is at least the groundwater level, acidity, conductivity and temperature);
- ascent height measurements (measurement date, ascent height, filter depth and reference height).

↓ If these data are included in the drilling descriptions or in the test tables, you should not describe them separately.

↑ Discuss anomalous field observations. If, due to the presence of debris or underground paving, boreholes or monitoring wells were not constructed or were not constructed as deep as planned, provide the reason for this. Also indicate whether a replacement borehole was installed.

↑ Discuss any deviations from the CMA.

8.4.4.2 Laboratory research

↑ You provide an overview of the analysis results.

↑ You should include at least the following information:
- the name of the laboratory;
- the sampling date;
- the date of arrival of the samples;
- the date of performance of the analyses;
- the analysis results;
- comments from the laboratory.

↓ If these data are included in the test tables or in the certificates of analysis, you should not describe them separately.

↑ You discuss the influence of the laboratory's comments on the conclusions of the report.

↑ Summarise all the results of the laboratory investigation in test tables, according to Table 8 and Table 9. You can use equivalent tables, but all data from Table 8 or Table 9 must be included.

↑ You should include the site-specific test values (guide value, soil remediation standard and any policy adjustments) in the tables and indicate whether they are exceeded.
↑ Justify the clay and organic matter content and the acidity that you use for the conversion of the test values.

↑ Include the tables in the PDF – report or the PDF – annex.

Cadastral plot	390B				Test values destination type III	
Contamination	ID1 and ID5			ID5		
Measurement site name	B1	PB2	PB2	PB4	Guide value	Soil remediation standard (BSN)
Sampling date	28.3.2019	28.3.2019	28.3.2019	28.3.2019		
Sensory perception + depth (m-bgl)	/	0-1 m-bgl: fuel oil odour	3-4 m-bgl: fuel oil odour	/		
Depth of sample for analysis (m-bgl)	0-0.5	0-0.5	3.5-4.0	0.5-1.0		
Total solids (%)	76.8	82.7	80.2	77.4		
Organic matter (%)	2					
Clay (%)	10					
Acidity (pH)	7					
Metals (mg/kg ts)						
Arsenic (As)	<10			<10	35	103
Cadmium (Cd)	<0.4			<0.4	1.2	6
Chromium (Cr)	5.6			19	91	240
Copper (Cu)	<5.0			11	72	197
Mercury (Hg)	<0.1			<0.1	1.7	4.8
Lead (Pb)	<10			90	120	560
Nickel (Ni)	<5.0			8.0	48	95
Zinc (Zn)	5.3			120	200	333
Mineral oil (mg/kg ts)	<50	**3400**	**14000**	<50	300	1000
PAH (mg/kg ts)						
Naphthalene	0.68			0.24	0.3	5
Benzo(a)pyrene	0.26			0.31	0.3	3.6
Phenanthrene	0.63			0.09	15	65
Fluoranthene	0.21			1.35	2.0	30
Benzo(a)anthracene	0.33			0.85	3.9	10.5
Chrysene	0.31			4.2	2.5	180
Benzo(b)fluoranthene	0.31			0.63	1.1	7
Benzo(k)fluoranthene	0.12			2.1	0.6	11.5
Benzo(ghi)perylene	0.22			0.42	0.3	3920
Indeno(123-cd)pyrene	0.2			6.4	0.7	20
Anthracene	0.1			0.1	2.4	70
Fluorene	0.1			0.1	9.5	3950
Dibenz(a,h)anthracene	0.1			0.1	0.3	2.9
Acenaphthene	0.1			0.1	3.1	14
Acenaphthylene	0.1			0.1	0.6	1
Pyrene	0.1			0.1	21	395
PAH Total	0.1			17.2		
Clay content used					10 %	
Organic matter content used					2 %	

Table 8: Summary of the analysis results for the solid part of the Earth (example)

Cadastral plot	523C			Test values	
Contamination	ID1 and ID5		ID5		
Measurement site name	PB2	PB3	PB4	Guide value	Soil Remediation Standard (BSN)
Sampling date	4.4.2019	4.4.2019	4.4.2019		
Filter depth (m-bgl)	2-4	2-4	2-4		
Groundwater depth (m-bgl)	2.5	2.2	2.6		
Sensory perception	Gasoline odour	Gasoline odour	/		
Presence of pure product + thickness	Floating layer 2.5 cm				
Acidity (pH)	6.7	6.4	6.1		
Temperature (°C)	12.9	11.7	12.1		
Conductivity (µS/cm)	369	1260	765		
Metals (µg/l)					
Arsenic (As)	<0.4		**32**	12	20
Cadmium (Cd)	<1.0		<1.0	3	5
Chromium (Cr)	<5.0		<5.0	30	50
Copper (Cu)	5.9		12	60	100
Mercury (Hg)	<0.05		<0.05	0.6	1
Lead (Pb)	<5.0		<5.0	12	20
Nickel (Ni)	5.9		**42**	24	40
Zinc (Zn)	430		120	300	500
Mineral oil (µg/l)	**15000**	**2800**	<50	300	500
Volatile aromatics (µg/l)					
Benzene	**780**	6	<0.2	2	10
Toluene	**1200**	12	<0.2	20	700
Ethylbenzene	**850**	5	<0.2	20	300
Xylene	230	360	<0.2	20	500
MTBE µg/l	**880**			20	300
VOCl (µg/l)					
1,2-dichloroethane			16	5	30
Dichloromethane			2.4	5	20
Tetrachloromethane			0.8	1.2	2
Tetrachloroethene			<0.5	5	40
Trichloromethane			<0.5	5	200
Trichloroethylene			2.1	5	70
1,1,1-trichloroethane			5.8	5	500
1,1,2-trichloroethane			<1	5	12
1,1-dichloroethane			25	5	330
Cis+trans 1,2-dichloroethylene			8	5	50
Cis-1,2-dichloroethylene			7.8		
Trans-1,2-dichloroethylene			0.2		
Vinyl chloride				2	5

Table 9: Summary of groundwater field and analysis results (example)

8.4.5 Chapter 'Evaluation of the data collected and a risk assessment'

8.4.5.1 Discussion of the final conceptual site model

↑ You should discuss how the results of the various studies complement the situational overview. You describe the final conceptual site model for the contamination.

↑ Discuss the data on which the conceptual site model is built:
- Provide a summary and interpretation of the data you collected during the fieldwork and analyses. You also take into account the relevant field data (general soil structure, stratigraphic interpretation, groundwater level, sensory observations) and field analyses (such as acidity, temperature and conductivity).
- Compare the current results with those from previous reports if a soil investigation has already been conducted on the land.
- You indicate whether, in addition to the analysis results, there are other indications of the presence of soil contamination.

↑ The conceptual site model also includes the horizontal and vertical containment. You indicate the volume and indicative pollutant load of the contamination and also provide the calculation thereof.

8.4.5.2 Justification of the nature of the pollution

↑ Substantiate the nature of the contamination on the basis of the results of the investigation into the source and origin of the contamination.

8.4.5.3 Risk assessment

↑ You should describe the risk assessment conducted in sufficient detail so that the risk assessment is reproducible.

↑ You outline a clear picture of the current and potential risks. As a first step, you draw up a conceptual risk model. This clearly shows per parameter or substance group what the source-path-receptor route is.

↑ You describe the input and the results of the exposure model. Also indicate which model you used.

↑ Discuss the four blocks:
- human exposure;
- ecological exposure;
- spread;
- policy adjustments.

↑ For each block, specify what data were used and what assumptions and presumptions you made. Justify and substantiate everything well. In addition, discuss and justify the result in detail.

↑ You distinguish between actual and potential risks.

↑ Finally, the risk assessment must make a statement on the entire risk. For a historical, mixed predominantly historical contamination or a contamination with a non-standard parameter, you clearly indicate whether there is a serious soil contamination. In all cases, the conclusion should be thoroughly substantiated.

8.4.6 Chapter 'Conclusion per contamination'

↑ You should describe for each contamination whether soil remediation is necessary. Also provide the remediation priority and the need for safety or precautionary measures and recommendations for use, and add the justification to the report.

↑ Compile these data in the tables 'summary of contamination status per land' and 'summary of the contamination'.

8.4.6.1 Need for soil remediation

↑ You should assign an O-, P- or Q-phrase to each contamination.

O-phrase:
- The guide value for the solid part of the earth and for groundwater has not been exceeded for any standardized parameter.
- The test value 'guide value' has not been exceeded for any non-standardised parameter.

P-phrase:
- The guide value is exceeded for one or more standardized parameters, but no soil remediation is required for the solid part of the earth or for groundwater.
- No non-standardised parameter requires soil remediation.

Q-phrase:
- New soil contamination: Soil remediation is necessary because the soil remediation standard has been exceeded or because a serious soil contamination has been identified that cannot be assessed against soil remediation standards due to its special nature.
- Historical soil contamination: Soil remediation is necessary because serious soil contamination has been identified.

8.4.6.2 The remediation priority

↑ Describe the information on which you base the assignment of a priority 1 or 2

8.4.6.3 Need for safety or precautionary measures

↑ You describe the need for safety or precautionary measures or the direct actions already taken to limit exposure.

↑ Justify which danger must be prevented, what the concrete measures are, and under which circumstances and within which preconditions these measures apply.

↑ Include at least the following elements:
- A list of any (safety) measures already taken.
- A list of direct actions already taken in the context of the duty of care.
- A justification and description of the precautions or safety measures to be taken, including:
  - The relevant DAEB assessment and the methodology applied in precautionary measures due to potential human exposure.
  - The nature of the contamination.
  - A table listing the proposed precautionary or safety measures. Also indicate whether the measures are subject to notification or authorisation, including VLAREM headings and class.
  - The materials used in this.
  - The estimated duration of the measures.
  - In the case of groundwater abstraction: the discharge standards, the intended abstraction rate, ...
  - The cadastral data of the land on which the precautionary or security measures must be carried out. Also indicate whether it is a source or spreading plot.
  - The cadastral data of the source plot. If the source plot is not known, indicate this as well.

8.4.6.4 Need for recommendations for use

↑ You describe the need for usage advice for each soil where soil contamination is present.

↑ You should justify why you assign recommendations for use.

↓ You can provide an end date for the recommendations for use. If you do not provide an end date, a period of 5 years will be taken into account.

↑ Describe the recommendations for use on the basis of Error: Reference source not found (Annex 3). Include only the rows of the table that apply. The column with the rules of thumb should not be copied. If you assign all subcodes, you must use the umbrella code. Example: if you assign code GA1a and GA1b, use the umbrella code GA1.

↓ You can further clarify or explain the recommendations for use GA1 to GA4 in the table if you deem it necessary.

↑ For code GA5, always provide additional explanation in the table.

↓ Example of additional descriptions of the codes: in the case of roadworks or works on utility lines, it is appropriate that workers use the necessary personal protective equipment.

8.4.6.5 Phases in a phased descriptive soil investigation

↑ In a phased descriptive soil investigation, you include a follow-up plan for the investigation of the other phases.

↑ You should indicate which cores or parameters were not discussed and provide a timeline within which further investigation will be conducted for all contaminants for which the client must carry out the descriptive soil investigation.

8.4.7 Chapter 'Declaration and signature'

↑ In each report, the following **declaration** is included:

The soil remediation expert declares:
- that this report has been carried out in accordance with the standard procedure for descriptive soil investigations;
- that the binding, guiding, and relevant advisory elements are included in the report and that he considers that the elements not mentioned in the report are also not applicable;
- that they are not incompatible for the performance of this contract or that he or she has taken management measures in the event of a situation of incompatibility;
- that this report is representative of the contamination status of the study site;
- that the content of the report corresponds to the digital data;
- that the following information – submitted to OVAM in the XML file – is legally binding:
  - administrative data;
  - users and operators that you learn about from a source other than the cadastre;
  - nature and severity at the level of the cadastral parcel.

↑ Each report lists above Error: Reference source not found the names of the persons who contributed to the report.
↑ Each report is **signed** according to Table 10. These persons bear the final responsibility for the report.

↑ Signing can only be done by the persons who have authorised the use of their digital signature. Signing 'on behalf' of someone else is not permitted.

Capacity	Name and signature [5]	Date
The person who has the individual signing authority (VLAREL Article 53/4(1)(2))		
The quality manager at the soil remediation expert for this soil investigation		
The person who can legally represent the soil remediation expert vis-à-vis third parties[6]		

Table 10: table for signature

↑ If you suspect that you are in a situation of **incompatibility**, describe the management measure taken.

8.5 PDF – SUMMARY PER LAND

↑ Summarise the contamination and contamination status per land in the PDF file 'PDF - summary per land'. Use table 12 and Table 13 for this.

8.5.1 Explanatory notes to the tables

8.5.1.1 Plots and data on contamination

↑ You discuss the general contamination situation for each **source parcel**. Take into account all soil information available for each of these soils. For **spreading plots**, you may limit the discussion of the contamination situation to the contamination you describe in the descriptive soil investigation.

↑ Mention all **plots** where the contamination was identified. Always use the most recent cadastral data of the land. Optionally, you may make an additional division per zone or sub-location.

↑ The **reference number** of the contamination is the existing reference number from previous soil investigations. If there is no reference number available for a contamination, assign a number.

↑ The **nature** is the nature of the soil contamination as recorded in the respective soil survey.

↑ In the **name** of the contamination, mention only the substance group (examples: heavy metals, PAHs) or the individual parameters (example: zinc and copper). You may include the source in the name of the contamination only if this is necessary to maintain an overview.

↓ Some practical tips:

[5] Signing may be done by one or more persons each time.
[6] Included for self-employed persons (VLAREL, Article 4(2)).

- A soil may already have been extensively examined, resulting in a comprehensive description of the contamination situation. The information on the plot of land available from OVAM is included in the soil certificate of the land. You can also look up this information on the e-portal for soil remediation experts.
- A plot of land can be included in several files available at OVAM. Therefore, consult the e-portal not only via the file number but also search via the cadastral data (cadastre ID according to the notation '00000 X 0000 / 00 X 000') or via the address of the plot of land.

↑ For **already known soil contamination**, fill in the classification for each assignment (damage case or notification of soil contamination, soil or final evaluation investigation, soil remediation project) in which the soil contamination is described.

↑Use the assessment framework of the respective standard procedure or code of good practice.
↓ You can translate the former classification into the current classification in a simplified manner (Chapter 8.4.6.1) on the basis of Table 11.

Classification	Classification	Translated to...
N-phrase, X-phrase	K-phrase	O-phrase
Y-phrase	L-phrase	P-phrase
R-phrase	M-phrase	Q-phrase

Table 11: simplified translation of the former classifications into the current classification

Indicate in brackets the assessment at that time.

↑ Decisions, additional measures and recommendations for use cannot be revised unless they are the subject of the descriptive soil investigation.

8.5.1.2 Assessment

↑ For each cadastral plot, you should check whether the plot is a source plot or a spreading plot.

↑ Assign a classification (O-, P-, Q-, W- or U-phrase) for each land to the 'summary decision on plot by nature' according to the assessment framework below. At plot level, you can only assign one classification per nature. So take into account this decreasing order if several contaminants of the same nature are present: Q-, W-, P-, U- or O-phrase.

Q-phrase:
- (New soil contamination) Soil remediation is necessary because the soil remediation standard has been exceeded or because a serious soil contamination has been established that cannot be assessed against soil remediation standards due to its special nature.
- (Historical soil contamination) Soil remediation is necessary because serious soil contamination has been identified.

W-phrase:
- Soil remediation is necessary.
- The identified soil contamination did not occur on this land. The remediation obligation rests with the owner or user of the land where the soil contamination occurred.

P-phrase:

- The guide value is exceeded for one or more standardized parameters, but no soil remediation is required for the solid part of the earth or for groundwater.
- No non-standardised parameter requires soil remediation.

U-phrase:
- No soil remediation is required.
- The identified soil contamination did not occur on this land.

O-phrase:
- The guide value for the solid part of the earth and for groundwater has not been exceeded for any standardized parameter.
- The test value 'guide value' has not been exceeded for any non-standardised parameter.

↓ Therefore, an O-phrase is only assigned to:
- a source plot;
- a spreading plot on which an excavation below the guide value was carried out during the descriptive soil investigation;
- A plot on which contamination was found in a previous soil survey, but that contamination is not confirmed in the descriptive soil survey.

↓ Is soil remediation necessary? Then assign a Q- or W-phrase to all plots that fall within the contour of the guide value or that fall within the contour of the serious soil contamination for non-standardised parameters.

↓ Is there no need for soil remediation? Then assign a P- or U-phrase to all plots that fall within the contour of the guide value or that fall within the contour of the serious soil contamination for non-standardised parameters.

↓ Did you only install containment boreholes on a cadastral plot and did you not detect any contamination above the guide value? Then you do not have to make a statement for this cadastral plot, unless the plot is a source plot.

8.5.1.3 Additional measures and usage advice

↑ Fill in the table as follows:
- For contamination that is the subject of the descriptive soil investigation:
  - Describe the imposed precautionary or safety measures (you may also add this information as text below the table to enhance readability).
  - Describe the assigned recommendations for use by indicating the code according to Error: Reference source not found (Annex 3).
- For soil contamination for which additional measures (use or destination restrictions, precautionary or safety measures) or recommendations for use have already been imposed in the past:
  - Describe the measures imposed as they were formulated in the past. (You can also add this information as text below the table to enhance readability.)
  - Describe the assigned recommendations for use by indicating the code.

8.5.2 Table 'Summary of contamination status per land'

↑ Compile the data from the soil, together with a concise summary of the contamination status in table 12.

↓ OVAM is aware that such a tabular representation can be a simplification of the actual situation, but calls for this table to be filled in as completely and correctly as possible.

Plot				Pollution data				Assessment						Additional measures and usage advice	
Land	Current and future destination type	Destination type used for evaluation	Source or Spread	Reference number	Medium	Name	Nature + predominant part	Damage case or notification of soil contamination	(part) OBO	(part) BBO	(b)BSP	EEO	Remediation priority	Need for additional measures	Instructions for use
523 P	III	II	B	111	VDA	Mineral oil	N					P			
			B	**2**	**GW**	**VOCl**	**H**		**Q**	**Q**			**1**	**No**	**GA2, GA4**
			B	**3**	**VDA**	**Mineral oil**	**GOH (75 %)**		**Q**	**P**					**GA1**
			V	4	GW	Heavy metals	GON (80 %)		Q						
			Summary decision on plot by nature				N	P							
							H	Q							
							GOH	P							
							GON	W							
523 X	II	II	**V**	**2**	**GW**	**VOCl**	**H**			**Q**			**1**	**No**	**GA2, GA4**
			Summary decision on plot by nature				H	W							

table 12: summary of the pollution status per soil (example)

Legend table 12:

→ Medium : Choose from solid part of the earth (VDA), groundwater (GW), floating layer (LNAPL), dense layer (DNAPL), surface water (OppW), water bottom sediment (WBsed), solid part of the water bottom (VDWB), air, pure product (NAPL), egg, crop, etc.

→ Nature : Choose from new (N), historical (H), mixed predominantly new (GON), mixed predominantly historical (GOH), mixed-new (GN). For mixed predominantly new and mixed predominantly historical contamination, also provide the percentage of the predominant part.

↑ Put the contamination that is the subject of the descriptive soil investigation in bold.

8.5.3 Table 'Summary of the contamination'

↑ The contamination that is the subject of the descriptive soil investigation is summarised in Table 13.

Pollution reference number	Description	Source/location	Nature justification	Parameters	Contaminated volume (>BSN)	Indicative waste load (> BSN)	Human risk (Yes/No)	Ecological risk (Yes/No)	Dissemination risk (Yes/No)	Policy-based need for remediation (Yes/No)	Global decision on risk assessment: risk present
Pollution to be remediated											
Historical soil contamination											
2	VOCLs in the shallow groundwater near the production hall	former degreasing bath	The degreasing bath was decommissioned in 1986.	trichloroethylene cis-1,2-dichloroethylene vinyl chloride	3 200 m^3	30 kg	No	No	Yes	Yes	Yes
Contamination not to be remediated											
Mixed predominantly historical soil contamination											
3	mineral oil in the solid part of the earth near tank T1	above-ground diesel tank T1	Tank T1 was in use between 1980 and 2000.	mineral oil	45 m^3	8 kg	No	No	No	No	No

Table 13: Summary of the contamination (example)

8.6 PDF – MAP

↑ Compile the map material of the report in the PDF file ‘PDF – map’.

↑ The maps have a custom scale. Provide all maps with a scale bar with unit and a north arrow.

↓ Include the following maps:

↑ You add a **map** showing the location of the research site in the wider area.

↗ You add a **map** indicating the groundwater abstractions of category C, drinking water abstractions, catchment areas, and protection zones type I, II, or III within a distance of two kilometres from the research site. Designate (authorised) groundwater abstractions that lie within the contamination contour or that may affect the contamination.

↑ Detailed plan of the research site
You add a detailed plan of the survey site on which you have indicated all relevant elements necessary to evaluate the pollution situation:
- the cadastral plot boundaries and cadastral numbers;
- the VHA segment numbers and Lambert coordinates for waterbeds;
- current and former (if relevant) buildings;
- the relevant sources of contamination, including discharge points and transfer areas;
- paving;
- basements;
- groundwater abstractions;
- any elevations;
- overhead and underground pipes;
- drinking water pipes;
- the location and numbers of the previously installed and new measuring points (making a clear distinction between the different types of measurements, such as drilling, gauges, MIP, etc.);
- the location of the abandoned boreholes;
- other relevant information.

↑ Provide the plan with a legend.

↑ The map has a custom scale.

↑ Presentation of the research results
You should present the measurements carried out on a detailed plan showing at least the cadastral plot boundaries and numbers and the buildings. You create a separate map for the solid part of the earth and for the groundwater. ↓ Parameters that belong to one group can be displayed on the same map.

Provide the following maps:
- A map indicating the direction(s) of groundwater flow, preferably on the basis of groundwater isohypses.
- A map with the analysis results and the corresponding testing via measured values or colour shades. Indicate the date of the analysis and the sampling interval (per measuring point or per map).
- For the solid part of the earth, groundwater, sediment, and the solid part of the water bed: a map showing the contours of the contamination in the horizontal plane.
- ↗ A sketch with the contours of the contamination in the vertical plane. Also show the ground level, groundwater table, impermeable layers and filter settings. You indicate the location of the cross-section on a detailed plan.

Provide all plans with a legend.

↑ Presentation of the recommendations for use
You should present the zones with recommendations for use in the horizontal and vertical planes on a detailed plan showing at least the cadastral plot boundaries and numbers and the buildings.

Provide the map with a table containing the explanation of the recommendations for use. This table should contain at least the recommendation for use for the solid part of the earth or for groundwater with their code according to Error: Reference source not found (Annex 3) and the respective depth per code. In the legend on the map, display the description of the code.

You preferably combine the same usage advice for different contaminants into one contour.

↑ Other maps
If you conducted an excavation during the descriptive soil investigation, add the following maps:
- a map indicating the initial pollution contour(s);
- a map indicating the contour and depth of the excavation, the control samples and any residual contamination.

8.7 PDF – ANNEX

↑ Compile the annexes of the report in the PDF file ‘PDF – annex’.

↓ Include the following annexes, unless they do not apply:

↑ Include the drilling descriptions and analysis reports in a separate annex.

↗ Drilling descriptions
The drilling description or legend shall contain at least the following information (as included in the CMA):
- the unique name of the measurement site;
- the type of measurement: borehole or monitoring well;
- the drilling technique used: manual or mechanical, and the technique used with diameter type;
- depth of the borehole or dip tube;
- the lithology (both descriptive and graphic): main and secondary components and colour;

- the depth of the interfaces;
- sensory perceptions, including depth;
- the sampling technique used: stirred or unstirred;
- the depth at which the sample was taken;
- groundwater level:
  - during drilling;
  - for installation of a monitoring well: after stabilisation of the groundwater level;
- gauge construction, in a graphical diagram with accurate representation of filter collapse and clay plugs;
- the method of finishing at ground level: above or below ground, liquid-tight, protective cover.

Prepare a drilling description of all newly executed drilling. Drilling descriptions from previous soil investigations available from OVAM should not be included in the descriptive soil investigation.

↑ Analysis reports
You add the data from the analysis reports that cannot be provided digitally (such as GC diagrams).

↑ Photos
You provide an overview of the research location through photos of the contaminated area and relevant features in the vicinity. If the photos do not speak for themselves, you can clarify the image by, for example, adding a caption to the photo, indicating the location and direction in which the photo was taken.

↑ Analysis results
Add the tables, if they are not included in the PDF – report.

↑ Exposure model data
You add the input and output data and the basic parameters of the exposure model. You should also include the printout of the calculation model.

Groundwater abstractions
Add the list of groundwater abstractions that lie within the contamination contour or that may affect the contamination. Indicate the depth, the aquifer, the pumped flow rate and the distance to the site boundary of each abstraction.

You provide a list of groundwater abstractions of category C, drinking water abstractions, water abstraction areas, and protection zones type I, II, or III within a radius of two kilometres from the research site. Indicate also the name used by the Environment Department of the Flemish Government.

↑ Other annexes
If relevant or applicable, include the following annexes:
- for non-standardised parameters: development of the test values;
- for a determination of a risk limit value: product sheets or substance data;
- for alternative research techniques: the results of the research;
- reports of additional trials or tests;
- former and recent environmental or discharge permits (for landfills, etc.);
- for excavation during the descriptive soil investigation:
  - the technical report of the supplementary soil or analyses carried out for this purpose;
  - a stability study;

    - the perimeter of the site description, the plots to which the site description applied, and how detailed this site description was carried out;
- certificates and attestations:
    - certificates of leak detection tests conducted on storage tanks;
    - processing certificates for decommissioned tanks;
    - processing certificates for the removed soil or certificates of use;
- for groundwater modelling: the input data and the results of the groundwater modelling and, where appropriate, a visual representation of the results;
- for incompatibility: a report of the inspection by another soil remediation expert.

8.8 PDF – IMPORTANT INFORMATION

↘ Compile other important information in the PDF file 'PDF – important information', if you find that information relevant.

↓ Would you like to clarify something administratively? Could you not correctly or fully transmit the digital alphanumeric data due to (known) technical limitations of the e-portal? Were there any indications of problems with the soil remediation project during the implementation of the descriptive soil investigation (e.g. the timing)? If so, explain that further. Make sure your comments or concerns are well argued.

Examples of comments:
- No further work can be done on the existing contamination because...
- For contamination X, there are no recommendations for use because...

9 DIGITAL ALPHANUMERIC DATA

↑ You bundle the digital alphanumeric data into an XML file.

The xml file can only be supplied in the Mistral2 format. This format has been adapted to the e-portal.

9.1 STRUCTURE OF DIGITAL ALPHANUMERIC DATA

↓ There are three types of digital alphanumeric data:
- the administrative data from the report;
- the analysis results;
- the drilling descriptions.

The XML file bundles these three types into one file. The XML file must contain at least the administrative data in order to be uploaded to the e-portal.

The analysis results and the drilling descriptions can be stored in separate files. In the e-portal you can integrate these files into the Mistral2-XML via the profile name. The files must therefore contain the correct profile name.

9.2 LEGALLY BINDING INFORMATION

↑ The following information in the XML file is legally binding:

Administrative data (*)	
Assignment type	
Title	
Report date	
Assignment address:	Street and number (or description)
	Postal code, municipality, sub-municipality
Additional information on investigation:	Phased
Capacity 'Client':	Name
	Street and number
	Postal code, municipality, sub-municipality
Capacity 'Author':	Name
	Street and number
	Postal code, municipality, sub-municipality
Labels	
Nature and severity at cadastral plot level – locations tab (*)	
Users/operators	Current users and operators that you learn about from a source other than the cadastre
Judgment:	Historicity
	Classification
(*) Based on the field names in the e-portal.	

9.3 TECHNICAL AND SUBSTANTIVE REQUIREMENTS

9.3.1 Technical requirements

↑ The XML file must be 'valid'. This means that the file must comply with the XSD schemas. An XSD schema is a template that the XML file must technically comply with.

The XML file must meet a number of criteria to be 'valid'. The main criteria:
- All the elements are in the right place.
- All mandatory elements have a value.
- Each value meets the definition for that element (text, number, date, or a value from a list).

The XSD schema for the XML file containing the administrative data has been published on the e-portal.

The technical specifications for the XML file containing the analysis results can be found at www.ovam.vlaanderen.be.

Database Ondergrond Vlaanderen (DOV) and the OVAM published a joint format for the XML file. The XSD schema for the exchange of drilling descriptions can be found at www.ovam.vlaanderen.be. General drilling data and coded lithology are mandatory. Environmental data are mandatory if these measurements have been carried out. Other data are optional.

9.3.2 Substantive requirements

↑ Mandatory fields are always completed. Non-mandatory fields are filled in if information is available for this purpose for the specific assignment for which the report is being prepared.

In a field, a reference such as 'see report/PDF' is not correct.

10 DIGITAL SPATIAL DATA

↑ The digital spatial data is bundled into a shape file and sent in a zip file. You use a separate zip file for contaminants and recommendations for use, with the respective filenames 'GIS – contaminant file' and 'GIS – recommendation for use file'.

10.1 GENERAL TECHNICAL INFORMATION

↑ The structure used by OVAM for the exchange of digital spatial data can be found at www.ovam.vlaanderen.be.

10.1.1 Shapefile

↑ Shapefiles must technically comply with the guidelines of this document: www.esri.com/library/whitepapers/pdfs/shapefile.pdf.

A shapefile always consists of three subfiles:
- Name.shp (with the spatial information).
- Name.shx (the index list).
- Name.dbf (the attribute list, in a DBaseIV-compatible format).

A shapefile can store data of one geometric type. Thus, point, line and area data are grouped into separate shapefiles.

The name of the attribute fields in the shape file may consist of a maximum of 10 letters. Longer names are not possible.

↑ The following chapters list the mandatory data fields. You can also add your own data fields, but these are not included in the OVAM database.

10.1.2 Projection

↑ The data are placed within the projection and coordinate system of Lambert72. The projection has the following characteristics:

Ellipsoid (Hayford International Ellipsoid 1924)

Ellipsoid parameters	
Belgian datum 72 to WGS 84	
Da	- 251 m
Df	- 0.000014192702

Date

7-parameter transformation	
Belgian datum 72 to WGS 84	
Dx	- 99.059 m
DY	53.322 m
DZ	- 112.486 m
Rot X	- 0.419”
Rot Y	0.830
Rot Z	- 1.885”
K	0.999999

Projection parameters (Type: Conical Lambert with two standard parallels)

Projection parameters	
Origin width	90° 00' 00" NB
Central meridian	4° 22' 02,95200" OL
Southern intersecting parallel	51° 10' 00,00204" NB
Northern intersecting parallel	49° 50' 00,00204" NB
False origin in y	5400088.438 m
False origin in x	150000.013 m

Source: National Geographic Institute

10.1.3 Accuracy

↑ The spatial objects are placed in the Belgian coordinate system with an accuracy of one meter. This accuracy can be verified by placing the data in relation to general reference layers, such as orthophotos or a digital topographic map.

10.1.4 Topology

↑ The files are topologically in order. An automatic check does not identify any topological errors.

10.2 TECHNICAL AND SUBSTANTIVE REQUIREMENTS FOR SOIL CONTAMINATION

↑ The digital spatial data of the contamination are mandatory for all soil contaminations subject to investigation that are included in the descriptive soil study.

↑ For each contaminant, provide the following outlines, if applicable:
- core: the zone with the core of the pollution;
- pure: the pure product zone (only relevant for the medium ‘float or sink layer’);
- standard: the zone in which the soil remediation standard is exceeded (relevant only for the medium ‘fixed part of the earth’ or ‘groundwater’);
- guide value: the zone in which the guide value is exceeded (relevant only for the medium ‘solid part of the earth’ or ‘groundwater’).

↑ You create the outlines for the contaminants. If the assignment area has already been investigated before, you can request the digital data from OVAM and continue to work on this.

↑ If you create contours yourself, the shapefile must have the following structure:

Field name	Data type	Mandatory?	Description
Contamination	Long integer	Yes	Pollution reference (= the pollution code in the digital report)
Type	Text: 1	Yes	The code corresponding to: K: core P: pure N: standard R: guide value
Description	Text: 50	No	Free text field (example: number of the tank where the contamination occurred)

↑ The file name for the shape file is "Verontreinigingen.shp".

↑ The file contains only areas. Points and lines are not allowed. The contours may be full discs. The contours must therefore not be cut out and may overlap.

↑ Substantive requirements:

- There is at least one contour for each contamination with classification ‘further action’.
- There is at least one contour for each contamination with classification ‘no further action’ if:
  - the contamination was mapped using containment boreholes or monitoring wells;
  - the contamination is not point source contamination;
  - the fields ‘area’, ‘volume’, ‘pollutant load’ and ‘upper and lower limit’ are filled in with a value that is not ‘0’.
- If several contours have been drawn for a contamination, the ‘guide value’ contour must include the other contours.
- The ‘pure product’ or ‘core’ contour must always lie entirely within the ‘standard’ contour.
- For contamination with the medium ‘float or sink layer’, there must be a ‘pure product’ contour.
- For contamination with a medium other than ‘float or sink layer’, there should not be a ‘pure product’ contour.

10.3 TECHNICAL AND SUBSTANTIVE REQUIREMENTS FOR THE RECOMMENDATIONS FOR USE

↑ The digital spatial data of the recommendations for use are mandatory for all assigned recommendations for use.

↑ Recommendations for use are linked to contaminants in the e-portal. Each recommendation for use is assigned a reference in the e-portal as a reference to the GIS contour of this recommendation for use. This reference is entered in the ‘Reference’ field of the shapefile.

↓ If multiple recommendations for use can be described by the same contour, they can refer to one contour by using the same reference.

↓ If the area in which recommendations for use apply for multiple contaminants is the same, they can refer to one contour. Therefore, one contour can be used for multiple recommendations for use of multiple contaminants.

↓ If the assignment area has already been investigated before, you can request the digital data from OVAM and continue to work on this.

↑ If you create contours yourself, the shapefile must have the following structure:

Field name	**Data type**	**Mandatory?**	**Description**
Reference	Long integer	Yes	GIS reference (= the reference of the recommendation for use in the e-portal)
Description	Text: 50	Yes	GA code

↑ The file name for the shapefile is ‘Gebruiksadviezen.shp’.

↑ The file contains only areas. Points and lines are not allowed. The contours may be full discs. The contours must therefore not be cut out and may overlap.

↑ Substantive requirements:

- For each contamination with recommendations for use, each recommendation for use is represented by a contour.
- A contour must be present for each recommendation for use with a unique reference. The contour must have the same reference.

Part 4: Annexes

10.4 ANNEX 1: GLOSSARY

Achilles care system	The care system for on-site soil remediation works or risk management measures drawn up by OVAM. It covers the aspects of safety, health, and the environment within the framework of the Soil Decree.
Anthropogenic disturbance of soil	A human intervention by which the natural composition of the soil is altered. This specifically refers to: - replenishing natural depressions or excavation pits; - the disposal of waste materials on or in the natural soil; - the application of soil.
BATNEEC principle	(Best Available Techniques Not Entailing Excessive Costs) The best available technical solutions that have been successfully applied in practice and whose cost is not unreasonable in relation to the result to be achieved in terms of protecting people and the environment. This is independent of the financial capacity of the person on whom the remediation obligation rests.
BAT (see also BATNEEC)	Most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing, in principle, the basis for emission limit values designed to prevent and, where that is not practicable, to generally reduce emissions and the impact on the environment as a whole: - 'techniques': includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned; - 'available techniques': means those developed on a scale which allows implementation in the industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Flemish Region, as long as they are reasonably accessible to the operator; - 'best': means most effective in achieving a high general level of protection of the environment as a whole.
Sampling strategy/research strategy	Methodology that records the locations and depth of the samples to be taken in the context of a soil survey.
Source	A soil volume (including underground containers or waste) characterised by greatly elevated concentrations or pure product, from which the contamination spreads.
Source plot	Land where soil contamination occurred: land where an emission occurs or has occurred that directly or indirectly contaminated the soil.
DABM	Decree of 5 April 1995 laying down general provisions on environmental policy.
DIW	Decree on Integrated Water Policy.
Floating layer	Pure product that occurs at the groundwater level (at the level of the groundwater table and the capillary fringe) and gives rise to a pure product level.
E-portal	The internet application that OVAM wishes to use to exchange information with the soil remediation expert.

Operator	Operator as referred to in the Decree on Environmental Permits. The natural or legal person operating a classified establishment or on whose behalf it is operated.
Freatic groundwater	Water below the groundwater level in a relatively well-permeable layer and above a first poorly permeable or impermeable layer.
User	Natural or legal person who holds a right in rem or a right in personam over a land, with the exception of the owner. Association of co-owners in the context of property covered by the compulsory co-ownership system referred to in Article 3.84 of the Civil Code.
Instructions for use	Information on the use of land if contamination is present that exceeds the guide value (in the case of contamination in the solid part of the earth) or the soil remediation standard (in the case of groundwater contamination). The purpose of recommendations for use is to inform the parties concerned about the points of attention, consequences, risks and any measures to be taken as a result of the presence of (residual) contamination on the land.
Mixed predominantly new	Mixed soil contamination, most of which occurred after 28 October 1995.
Mixed predominantly historical	Mixed soil contamination, most of which occurred before 29 October 1995.
Guide substance	Substance that best describes the pollution, taking into account its toxicity and dispersion.
Earthworks	Rules for the use of excavated soil, as set out in Chapter XIII of the VLAREBO.

Hotspot	Term used in the context of the sampling strategy for landfills: zone where it is shown via visual inspection or the preliminary study that there is a high probability that contamination is present, such as dying vegetation, overflow of leachate, cracks in the covering film, etc.
Cadastral plot	Land for which the FPS Finance assigned a plot number.
Core	The zone with the highest concentrations of pollution (in the solid part of the earth, groundwater or as a pure product)
Methodology for clear identification of serious soil contamination	Methodology for determining when a descriptive soil survey is required for historical contamination.
Environmental damage	Environmental damage is damage as referred to in Article 15.1.1, 1° of Title XV of the Decree on General Provisions of Environmental Policy (DABM) of 5 April 1995, being damage which: 1 is caused by an emission, event or incident that occurred after 30 April 2007; 2 is by an establishment or installation listed in Annex IV of the DABM; 3 and which exceeds the soil remediation standard.
Nature Decree	Decree of 21 October 1997 on nature conservation and the natural environment.
Non-standard parameter	Parameter for which no soil remediation standard is included in the VLAREBO.
Bank	Strip of land from the crest of the berm and further inland over an arbitrarily defined width.
Research site	Site to which the soil investigation relates. The research location is a spatially contiguous whole.
Research strategy	See 'Sampling strategy'.
Origin	Event or activity that is the basis of soil contamination, such as spillage, a leaking tank, dumping, ...
Surface water (DIW)	Inland waters, excluding groundwater
Surface water body (DIW)	Distinct surface water, such as a lake, waiting basin, reservoir, stream, river, canal, transitional water, or a part of a stream, river, canal or transitional water.

Potential pollution source	Any activity or storage that may cause or have caused soil contamination in accordance with the Soil Decree: - risk establishments or activities included in the list referred to in Article 6 of the Soil Decree; - activities or installations from the VLAREM I classification list which relate to the storage, transport or reservoirs of liquid products (including pipelines and sewers) and which may cause soil contamination; - the use of waste materials for a functional hardening on top of existing soil, where the waste materials are clearly distinguishable from the soil material; - sites where damage has occurred; - locations where contamination is detected during the site visit. …
Pure product	A liquid, hydrophobic contaminant, mobile or not, that occurs in the soil as a separate (non-aqueous) phase (Non-Aqueous Phase Liquid - NAPL). The pure product is mobile (under the influence of gravity or capillary forces) if the retention capacity of the soil is exceeded. Another name for this is free product. Pure product that is present in soil pores at levels below the soil retention capacity and is therefore immobile is called residual pure product. A synonym for pure product with a specific gravity less than 1 is also called LNAPL (Light Non-Aqueous Phase Liquid). If the specific gravity is greater than 1, it is called a DNAPL (Dense Non-Aqueous Phase Liquid).
Residual pollution	Content of contaminants or organisms on or in the soil or buildings, which is found in the soil or buildings after a soil investigation or after the completion of remediation works and which exceeds the guide value for the solid part of the earth or the soil remediation standard for groundwater, but for which no further investigation or measures are necessary under the current circumstances.
Guide value	Soil quality guideline: Value below which the soil can perform all its functions without any restriction having to be imposed. This protects the soil quality for future generations.
SAP	Standard analysis package for the solid part of the earth and groundwater.
Sediment	A mixture of fine inorganic and organic particles that has settled from the water column and forms a layer on the bottom.
Site survey	Soil surveys carried out on a site to map the soil contamination or potential soil contamination arising from the soil-polluting activity for which the site has been identified and to determine its severity. The site survey meets the objectives of an exploratory and descriptive soil investigation for the soil-polluting activity for which the site has been designated.
Special Protection Area	The areas designated by the Flemish Government in accordance with Chapter V, Section 3bis of the Nature Decree.
Closure of a (risk) establishment	Cessation of all activities or all substantial activities of a (risk) establishment.
Stable end state	Stable soil quality in accordance with the intended remediation

	objectives achieved after the active soil remediation works.
Dumping	Deliberately disposing of waste materials on or in the soil (with the exception of buildings) irrespective of the nature, duration and extent of the deposited material, and where the waste materials are not intended to be disposed of or treated in the short term. Short term means 1 year for the disposal of waste materials and 3 years for the treatment of waste materials (source: emis website, VITO).
Landfill	Site where landfilling is or was carried out, with an area greater than 2.5 ares.
Target value	Soil quality target value: Content of contaminants or organisms on or in the soil, which is found as a normal background in uncontaminated soils with similar soil characteristics.
Remediation value	Concentration of contaminants or organisms on or in the soil or structure, which is to be achieved by the soil remediation works.
Trigger value	The trigger value for further investigation aims to make an initial distinction between water bottoms where there are very unlikely to be ecological risks caused by the contamination present and the water bottoms where ecological risks may be caused.
Solid part of the water bottom	The naturally occurring consolidated part of the soil of the surface water body, specific to the region in which the surface water body is located.
VCOR	Codified Decrees of the Flemish Spatial Planning Codex

Safety coordinator	Health and safety coordinator as referred to in the Royal Decree of 25 January 2001 on temporary or mobile construction sites. The Royal Decree distinguishes between a design coordinator (for the design phase of a project) and an execution coordinator (for the execution of the works).
VEN areas	Areas belonging to the Flemish Ecological Network demarcated pursuant to Chapter V, Section 1 of the Nature Decree.
Suspicious soil layer	Soil layer in which the highest concentrations of pollutants are expected based on sensory observations, the soil structure, the location and depth of the possible source of contamination, the properties of the suspect substance(s),...
Suspicious substance	Substance for which, on the basis of the preliminary study, it can be deduced that it may cause soil contamination at the site under investigation. A suspected substance is related to a potential source of contamination that may or could have given rise to soil contamination at a research site. Substance for which concentrations were found in a previous soil investigation that give rise to further measures and which can be related to the activities that are being or were carried out on the site (including fill soils).
Suspect zone	Place with potential sources of contamination or place where contamination has already been detected.
Pollution source	Cause of the pollution leading to soil contamination.
Dissemination plot	Soil to which pollutants or organisms have spread or where soil contamination has harmful effects.
Voluntary soil remediation	Soil remediation carried out by a voluntary remediator.
Water bottom (DIW)	The bottom of a surface water body that is always or for a large part of the year under water.

10.5 ANNEX 2: LABELS

Each descriptive soil investigation report receives at least one label (see Chapter 2.3). You can choose from the following labels:

- **Asbestos**: Soil contamination with asbestos.
- **Atmospheric deposition**: If you decide that atmospheric deposition investigation is appropriate, assign the atmospheric deposition label.
- **Brownfield**: A brownfield is neglected or underutilised land that has been so degraded that it appears that it can only be used or reused through structural measures.
- **Dry-cleaning/laundry**: All active and former companies that dry-clean textiles, as well as all industrial or commercial activities using VOCs in an installation for cleaning clothes, furniture fabrics and similar consumer goods, with the exception of manual stain removal in the textile and clothing industry.
- **Drug-related**: On the site, there are indications of the abandonment of drug waste or associated chemicals, or there are indications of (illegal) production of drugs, such as a drug lab.
- **Garage and bodywork**: All active and former garage and bodywork companies and related companies that carry out construction, repair, and maintenance work on motor vehicles in the broadest sense on cars, motorcycles, trucks, vans, agricultural machinery, buses, and respective trailers.
- **Gasworks**: The label is assigned to all former ‘gas sites’. Gas sites can be divided into three categories: actual gas works (Heading 16.1), gas holders (storage of gas) and sites where gas production or storage was carried out as a secondary activity (example: a textile factory with gas production).

- **Agriculture and horticulture:** All active and former farms that are part of agriculture (arable, livestock and mixed) and horticulture (vegetable, ornamental and fruit cultivation).
- **Compulsory co-ownership**: Properties with more than one owner and which fall under Article 3.84 of the Civil Code. In the properties, there are common and private parts.
  - Example: classic apartment buildings
  - Possible examples: shopping centres, business centres, residential care centres, garage complexes, etc. with multiple owners, where it is clearly defined who owns which part (example: unit 5 of the business centre belongs to owner X, the car park is common, etc.).
  - There is no compulsory co-ownership if, for example, three children have inherited a home and thus become co-owners, or in the case of a residential care centre with a single owner.
- **Owned by local authorities**: The source plot is owned by a municipality, intercommunal association, autonomous municipal company, intermunicipal partnership, Public Centre for Social Welfare, province or provincial development company (POM). Parts of a public domain as a spreading plot do not fall under this.
- **Owned by the Flemish Government**: The source plot is the property of the Flemish Government as included in the guide to the standard procedure for descriptive soil investigations.
- **Private individual**: The (client and/or) owner is private.
- **PFAS**: The label shall be assigned to all studies in which PFAS is considered to be a suspect or a contaminant.
- **Promaz CSC**: the contractor has completed remediation and has a final declaration.
- **Promaz CSO**: the contractor is remediating and the soil investigation is yet to start.
- **Promaz CSW**: the contractor is remediating and the works have already started.
- **Promaz PSO**: Promaz is remediating and the works are yet to be fully started.
- **Promaz PSW**: Promaz is remediating. The remediation works were started by the contractor, but Promaz is taking over.
- **Industrial Emissions Directive (IED)** An S-installation is located on the site.
- **School**: Institution providing education: kindergartens, primary and secondary schools, music schools, boarding schools and Student Guidance Centres (CLBs).
- **Fuel oil tank for heating**: Current or former tank for **heating** with fuel oil/heating oil (regardless of tank volume) which is the cause of the damage case or notification of soil contamination.
  For this fossil fuel, there are various popular names: 'mazout', fuel oil or heating oil. There are different types of fuel oil on the Belgian market:
  - Fuel oil with the official name 'Gas oil-heating'. 'Type B domestic heating oil', with low sulphur content.
  - Fuel oil with the official name 'Gas oil-Diesel' (for heating purposes). 'Type A domestic heating oil', with very low sulphur content.
  - Heating oil with additives

  (source: Informazout)
  You should assign this label to the assignment types: notification of damage case, establishment of damage case, notification of soil contamination, other screening, source determination, Premaz screening. As well as to the subsequent assignments (descriptive soil investigation, soil remediation project and final evaluation investigation or post-damage evaluation report). In an exploratory soil investigation, you only assign the label if you identified contamination at the level of the tank that requires further action. In an exploratory and descriptive soil investigation, you assign the label if you identified contamination at the level of the tank in the exploratory soil investigation phase that requires further measures.
- **Landfill**: Site where authorised or unauthorised landfilling is or was carried out: inter alia, Headings 2.3.6, 2.3.7, 2.3.11, 2.3.8.d1, 2.3.10 and Subheadings.
- **Petrol station**: All active and former public fuel distribution facilities for motor vehicles, being facilities for the filling of fuel tanks of motor vehicles with liquid fuels intended to power their engines.

- **University**: All higher education institutions: universities, colleges and evening schools (not linked to schools).
- **Transport – goods and persons**: All active and former companies that provide passenger and freight transport on their own account (or on behalf of third parties), using their own facilities for repairing and supplying their own means of transport.
- **Water bottom**: Bottom of a surface water body that is always or for a large part of the year under water.
- **Water catchment area**: Located in a water catchment area or protection zone.
- **Not applicable**: None of the above labels apply to this assignment.

10.6 ANNEX 3: RECOMMENDATIONS FOR USE

Code	Description of the works	Standard phrases (according to e-portal and soil certificate)	Potential risks or impacts of these works due to contamination	Possibilities, actions or measures that may apply to the pollution (depending on the planned works)	Rules of thumb for allocation
GA1	**Earthworks / excavation in soils**	**Due to the Regulation on Earthworks, there are restrictions on the use of excavated soil. When excavating, it is appropriate to take measures to prevent exposure to the contamination.**			
GA1a	Earthworks	Due to the Regulation on Earthworks, there are restrictions on the use of excavated soil.	1 Additional costs if the removed soil needs to be cleaned. 2 Impact on the new design	1 Preparation of technical report: additional sampling and analysis necessary, including a reassessment of the known contamination in relation to the planned works. 2 Re-use of land within or outside the cadastral working area – to be determined on the basis of the technical report. 3 Soil removal and processing – to be determined on the basis of the technical report. 4 Updating the risk assessment to evaluate possibilities for re-use of soil – to be determined on the basis of the technical report. 5 Aligning the design with the known results (e.g. adjusting the location of the area/basement to be excavated).	This advice is given if the concentrations in the solid part of the earth exceed the guide value.
GA1b	Excavation in soils / carrying out operations in the contaminated area	When excavating, it is appropriate to take measures to prevent exposure to the contamination.	1 Direct exposure to the contamination; workers are exposed to the contamination during the works. 2 Exposure through inhalation of air.	1 Environmental guidance or supervision during the excavation – to be determined on the basis of the technical report. 2 Updating of the risk assessment to evaluate any risks arising from exposure to the contamination. 3 Provision of personal protective equipment during excavation work or operations in the contaminated area (small works, private individuals). 4 Drawing up a specific risk analysis on occupational safety – to be conducted by the prevention adviser of the company where the work is being performed.	This advice is given if the concentrations exceed the soil remediation standard for a destination type III (standard soil) in the solid part of the earth or if the risk assessment (BBO or EEO) shows that direct exposure during earthworks is relevant. It concerns contamination in the solid part of the earth that occurs at a relevant depth (in most cases < 70 cm-bgl). In residential areas, this recommendation for use relates mainly to small operations where raising awareness on the use of gloves is useful (e.g. digging trenches for pipes, digging a pit to plant a tree, constructing a terrace, digging in a rainwater barrel, digging in posts for a fence). In the case of major works (e.g. constructing a swimming pool) or works in an industrial zone, this recommendation for use is also provided and, additionally, a technical report is usually drawn up in which environmental guidance may or may not be recommended. More extensive personal protective equipment is often required in consultation with the prevention adviser and the contractor.
GA2	**Groundwater abstraction and/or use**	**When dewatering is carried out, it is appropriate to take measures to prevent the spread of groundwater contamination. In addition, it is not recommended to use the**			

Code	Description of the works	Standard phrases (according to e-portal and soil certificate)	Potential risks or impacts of these works due to contamination	Possibilities, actions or measures that may apply to the pollution (depending on the planned works)	Rules of thumb for allocation
		groundwater for various applications, such as drinking water, use in the garden, or for industrial purposes. Also for applications such as a heat pump, it is recommended to take measures to protect the system.			
GA2a	Implementation of dewatering in, for example, construction works	When carrying out dewatering, groundwater reductions or abstractions, it is appropriate to take measures to prevent the spread of groundwater contamination and the discharge of contaminants.	1 Horizontal or vertical spread of contamination in groundwater. 2 Discharge of pollutants into sewage or surface water.	1 Taking measures to prevent the spread of contamination (e.g. counter-pumping). 2 Splitting the dewatering line into a part inside and a part outside the contamination. 3 Installing a water purification system. 4 A soil remediation expert monitors the concentrations in the pumped and/or discharged water. 5 Applying for a discharge permit. 6 Looking at other measures for the excavation: limiting the depth or avoiding dewatering.	1 You will evaluate this recommendation if the concentrations in groundwater exceed the soil remediation standard and if, due to the extent of the contamination, an impact on the discharge or spread is expected in the event of any dewatering. In case of limited exceedance in concentration or extent, this recommendation for use is not relevant. For guidance, you can use the methodology 'Clear indication of serious soil contamination – DAEB' from the exploratory soil investigation (both for new and for historical contamination). If there is no clear indication of serious soil contamination, this advice for use is not relevant. 2 This recommendation only applies if the groundwater contamination is in an aquifer where drainage can be carried out (depth of groundwater, depth of contamination). You must verify and clarify the relevance.
GA2b	Pumping of groundwater for own use for consumption and personal hygiene (drinking water and watering water)	It is not recommended to use the groundwater as drinking water or for personal hygiene. Use as drinking water for livestock is also not recommended.	1 Exposure due to dermal contact when using water (shower, bath). 2 Exposure by ingestion of contaminated water (drinking). 3 Exposure by ingestion of vegetables sprayed with contaminated water or meat from animals watered with contaminated water. 4 Horizontal or vertical distribution of pollution in groundwater.	1 Conducting a new risk assessment – depending on the decision of this risk assessment, soil remediation may still be necessary. 2 Additional monitoring of groundwater for other parameters in the context of its use for consumption. 3 Exploring possibilities for the use of groundwater from other aquifers or locations – evaluation of the impact on groundwater contamination and use.	1 This recommendation applies in recoverable aquifers and if a groundwater extraction is realistic according to the destination and location of the site. In an urbanised environment, new groundwater abstraction wells are unlikely to be drilled. In rural settlements or in agricultural areas with a recoverable aquifer, there is a real chance that additional groundwater extractions will be drilled for consumption of drinking or watering water. 2 If the concentrations in the groundwater exceed the soil remediation standard, you must estimate whether (1) a new groundwater extraction is involved and (2) the concentrations can lead to a potential risk. If water extraction is relevant, this assessment must also be made in the risk assessment to determine the need for remediation.
GA2c	Pumping groundwater for other use in the home, garden or	It is not recommended to use the groundwater for the garden. An industrial application without having the risks evaluated is also not	1 Exposure due to dermal contact when using water (cleaning, car washing, etc.). 2 Horizontal or vertical distribution	1 Conducting a new risk assessment – depending on the decision of this risk assessment, soil remediation may still be necessary. 2 Exploring possibilities for the use of groundwater	1 Also look at the GA2b rules of thumb. 2 Unlike GA2b, this recommendation for use should not aim for drinking water quality. You need to determine whether a recommendation for use makes sense

Code	Description of the works	Standard phrases (according to e-portal and soil certificate)	Potential risks or impacts of these works due to contamination	Possibilities, actions or measures that may apply to the pollution (depending on the planned works)	Rules of thumb for allocation
	industrial application	advisable.	of pollution in groundwater.	from other aquifers or locations – evaluation of the impact on groundwater contamination and use.	based on the concentration, type of contamination and extent.
GA2 d	Use groundwater for other purposes (heat pumps,...)	If the groundwater is used for purposes such as a heat pump, it is recommended to take measures to protect the system.	1 Degradation of the material used. 2 Exposure by inhalation. 3 Workers are exposed to the contamination during the installation of the system.	Aligning the design with the known results.	This recommendation applies if the aquifer is suitable for the use of heat pumps (sufficiently large aquifer > 10 m, depth and contamination, etc.) and if the contamination is present in the relevant layer. You must realistically estimate whether such a system is feasible on site and whether the contamination can affect this system. If only shallow groundwater is contaminated and this shallow aquifer is too small for a heat pump then you should not give this recommendation. This recommendation for use also applies only to 'open systems'.
GA3	**Change in land use**	**It is not appropriate to plant a vegetable garden, breed animals or remove any existing paving. If the land use changes due to, for example, demolition or new construction, or drilling is carried out or underground pipes are laid, an assessment of the possible risks is recommended.**			
GA3a	Removal of existing pavement	It is not appropriate to remove any existing paving on the site.	1 Exposure by direct contact with soil particles (ingestion, dermal contact, inhalation). 2 Change in exposure due to inhalation. 3 Change in leaching behaviour of the contamination.	1 Conducting a new risk assessment – depending on the decision of this risk assessment, soil remediation may still be necessary or it may be appropriate to provide for planting to limit ingestion or dispersal of dust particles. 2 If the policy values are exceeded, a soil remediation project must be drawn up.	1 This recommendation applies to concentrations above the policy values that are not remediated due to, for example, a technical impossibility (residual contamination under a building). 2 This advice is only applicable for shallow contamination that is located under the pavement at a depth of 0-70 cm-bgl.
GA3 b	Planting of vegetable garden	It is not appropriate to plant a vegetable garden on the plot.	Exposure by ingestion of vegetables.	1 Conducting a new risk assessment – depending on the decision of this risk assessment, soil remediation may still be necessary. 2 Changing the location of the vegetable garden.	This recommendation applies if the contamination is present at a depth of 0-70 cm-bgl and if the concentrations in the solid part of the earth exceed the soil remediation standard for a destination type III (standard soil) and in a residential zone or agriculture and if the contamination is present in a zone on the site that lends itself to a vegetable garden (e.g. not the entrance of a garage).
GA3c	Breeding of animals (pasture animals and/or chickens/poultry)	It is not appropriate to breed animals on the plot.	Exposure due to the use of meat, milk or eggs.	1 Conducting a new risk assessment – depending on the decision of this risk assessment, soil remediation may still be necessary. 2 Change the location of the pasture or animal pen.	1 This advice applies if the contamination is present at a depth of 0 - 70 cm-bgl and if the concentrations in the solid part of the earth exceed the soil remediation standard for a destination type III (standard soil) and in residential area or agriculture if the garden lends itself more realistically to breeding animals. If this possibility is realistic, include this route of exposure in the potential conceptual site model (BBO) and, based on the risk assessment in the descriptive soil study,

Code	Description of the works	Standard phrases (according to e-portal and soil certificate)	Potential risks or impacts of these works due to contamination	Possibilities, actions or measures that may apply to the pollution (depending on the planned works)	Rules of thumb for allocation
					determine whether animal breeding is possible. 2 If you are of the opinion that animal breeding is not relevant to the location (e.g. urban living), then this recommendation for use is not applicable.
GA3 d	Redevelopment with land use change: demolition of building and new construction with other characteristics (basement depth, etc.) or other construction area	If the land use changes due to, for example, demolition or new construction, a reassessment of the possible risks is appropriate.	Risks due to change in land use.	1 Conducting a new risk assessment – depending on the decision of this risk assessment, soil remediation may still be necessary. 2 Adapting the installation or location of buildings, gardens, etc. 3 Rethinking the choice of a basement. 4 If the policy values are exceeded, a soil remediation project must be drawn up.	1 This recommendation applies if, for volatile components (substances that can have an impact on indoor air quality and where the impact is strongly related to building characteristics), concentrations above the soil remediation standard for a destination type III (standard soil) or in groundwater above the soil remediation standard are present in the solid part of the earth and if certain building scenarios were not evaluated in the risk assessment. 2 This recommendation also applies when the policy values are exceeded if the contamination becomes accessible, for example, due to the demolition of the building.
GA3e	Execution of drilling or geotechnical works for, for example, foundations, pump pits, sheet piling, etc.	If drilling is carried out or underground pipes are laid, it is appropriate to take measures to limit the vertical spread of the contamination.	1 Risk of piercing impermeable layers. 2 Vertical dispersion of the contamination.	1 Choosing a custom drilling technique, e.g. with casing. 2 Choosing a different stability technique. 3 Adapting the location of the works.	This recommendation applies to indications of pure product at the level of the sealing or impermeable layer and if a sealing clay layer or impermeable layer is present at a depth that can be pierced (e.g. foundation piles) and can therefore have an impact on spread to the deeper aquifer.
GA3f	(Re)laying of underground pipes	When (re)laying underground pipes, it is appropriate to take measures to prevent permeation through the (drinking water) pipes.	Risks due to permeation in (drinking water) pipes.	1 Reviewing the location of the pipeline route or not carrying it out. 2 Adjusting the choice of material for the pipes (PVC/PE/etc.) to the contamination. 3 Using special gutters when laying the pipes.	This advice applies if the concentrations in the solid part of the earth exceed the soil remediation standard for a destination type III (standard soil) and if the contamination is present at a depth that is relevant for (drinking water) pipes (shallow layer up to 70 cm-bgl) and if the contamination consists of organic substances that can potentially migrate through pipes.
GA4	**Redevelopment with change of destination type**	**During the redevelopment of the site with a change of destination, a new risk assessment is appropriate**	1 Risks due to change of destination type. 2 Restrictions on a particular type or use.	1 Conducting a new risk assessment – depending on the decision of this risk assessment, soil remediation may still be necessary. 2 Adapting the installation of buildings, recreational areas, playgrounds, industry, etc. 3 Conduct an evaluation that takes into account the possibilities mentioned in GA3.	1 This recommendation only applies to land where repurposing can be expected in a more realistic way (e.g. incorporation into urban environments, former industrial land that has a high chance of being converted into a residential area). 2 The aim of this recommendation is not to achieve a multifunctional redevelopment for all areas and to evaluate all destinations. For example, the evaluation from residential area to agricultural area is not realistic and should not therefore be included in a recommendation for use.
GA5	**Others**	**… (to be described by you)**	To be described by you.	To be described by you.	To be determined by you.

Table 14: non-exhaustive overview of possible recommendations for use (GA)

To be annexed to the Ministerial Decree of [date of MD] establishing the standard procedure for the descriptive soil investigation under the Soil Decree of 27 October 2006.

Brussels, [date of MD]

The Flemish Minister for Environment and Agriculture,

Jo BROUNS