Remediation plan Ringdijk 390 in Ridderkerk

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2nd February 2021

[redacted]

Client

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1 Introduction

On behalf of Panattoni Dutch Development Coöperatie U.A., a remediation plan has been drawn up for the development site at Ringdijk 390 in Ridderkerk.

Reason

The reason for drawing up the remediation plan is the planned redevelopment of the site and the presence of soil contaminations at the site. These contaminations are an immobile heterogeneous contamination with heavy metals, asbestos, mineral oil and PCB in the topsoil, and a soil and/or groundwater contamination with mineral oil and VOCL.
The remediation of the aforementioned contaminations is urgent in view of the volume and/or the presence of sink or NAPL layers (VOCL and mineral oil). There is no urgency for the remediation of the immobile contaminations. The remediation will be carried out in combination with the redevelopment.

The remediation requires the preparation of a remediation plan in respect of which the DCMR Environmental Protection Agency Rijnmond ("DCMR") is the competent authority.

Purpose

The purpose of the present remediation plan is to clearly describe the remediation measures required to make the site suitable for future uses.

Situation

The site is located at Ringdijk 390 in Ridderkerk and is cadastrally known as Municipality of Ridderkerk, section B, numbers 2389 and 2569. The site has an area of approximately 57,800 m² and is partly built-up, partly paved with Stelcon, clinkers and/or asphalt, and is partly used as green space. A small part of the Veerweg road also belongs to the site under review. The buildings were used as storage space, industrial units/production halls, and office space.

There are plans in place to remove the current buildings and develop logistics facilities on the site.

Approach

In this document a remediation operation is worked out based on the requirements of the Dutch Soil Protection Act. For the assessment of the remediation variants, please refer to section 3.2. The detailed remediation approach is in line with the national remediation policy, as formulated in the 2013 Soil Remediation Circular of July 2013.

Sections in a nutshell

Section 2 describes the known data, including the results of previous surveys. Section 3 details the remediation measures. Next, Section 4 discusses the effects of the remediation on the environment.

2 General details

2.1 Site situation

2.1.1 Situation and history

The survey site is located at Ringdijk 390 in Ridderkerk and is cadastrally known as Municipality of Ridderkerk, section B, numbers 2389 and 2569. The site has an area of approximately 57,800 m² and is partly built-up, partly paved with Stelcon, clinkers and/or asphalt, and is partly used as green space. A small part of the Veerweg road also belongs to the site under review. The buildings were used as storage space, industrial units/production halls, and office space.

The site is located on the Donkersloot business park northeast of the town of Ridderkerk. On the east side flows the river Noord near the influx of the river Lek.

The site has been in use for business activities since around 1930. From around 1940 Holec BV, later Brush, was established on the site. The activities were discontinued around December 2019. The activities consisted of manufacturing machines and products for the metal and steel industries. In the past, the site was raised with various materials.

Figure 1 is an aerial photo showing the location of the survey site. The cadastral map of the site is shown in figure 2.



Figure 1: Aerial photo of the site (source: Cyclomedia, 2019)



Figure 2. Cadastral map of site location (source: Kadaster, 2020)

2.1.2 Redevelopment

There are plans in place to remove the current buildings and develop logistics facilities on the site. Greenery and a small water feature will be created in the southwestern section of the site. During the redevelopment, the access road (Veerweg) will remain intact. Figure 3 shows the planned development. For the time being, the intended construction level is identical to the existing ground level.

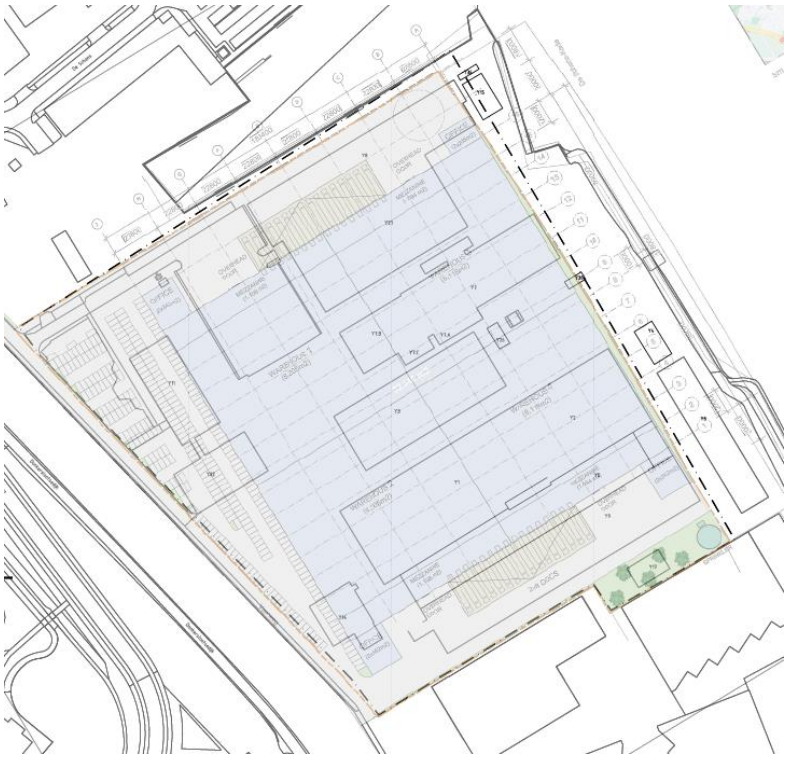


Figure 2: Future development

2.2 Contamination situation

In the period 1988 until 2020 many soil investigations and a remediation were carried out on the site. This section provides a brief overview of the studies conducted and their useful results. The overview is given in Table 1.

Table 1: overview on site conducted soil investigations

Investigation	Information	Conclusion*
IGF 1988, report number 85.930	Small part of the site (south corner) investigated	Soil: light to moderate contaminations with metals, mineral oil, PAH Groundwater: light contaminations with volatile aromatic hydrocarbons
DCMR 1989, report number384232/10	11 drillings were done on the site, It was concluded that further investigation was desirable	Soil: in general light contaminations with copper, PAH and EOCL (extractable organic chlorine compounds). Subsoil local moderate contamination with copper Groundwater: light contaminations with metals and EOCL, strong contamination with chlorophenols
IGN BV 1991, report number 11.460	Small part of the site (east of building Y3), in three drillings a turpentine odor was observed	Soil: moderate contamination with mineral oil and slight contamination with BTEX (volatile aromatics) Groundwater: moderate contamination with mineral oil, BTEX and VOCL (volatile chlorinated compounds).
BMD Rijndelta 1995, report number BMD/HOL/9410	Preliminary report to identify suspected sub locations	27 suspected locations were identified (see figure 4 for an overview)
IGN BV, 1995, report number MH95/1122	The 27 suspected locations were investigated	Soil: strong contaminations with metals, PAH, mineral oil, VOCL and PCB were found on different parts of the site Groundwater: Strong contaminations with mineral oil, VOCL and/or arsenic were found in 8 monitoring wells. One of the monitoring wells contained a floating layer of oil.
Oranjewoud 1999, report number 1601-69852	Further investigation of a mineral oil/VOCL contamination at building Y17 and Y18 (south part of the site)	Soil and groundwater contaminations with mineral oil and VOCL were contoured. The size of the strong contamination was estimated at 75 m^3 of soil and 400 m^3 of groundwater.
BMD Rijndelta, November 1999	Remediation plan for mineral oil and VOCL at building Y17 and Y18.	The remediation consisted of excavation of the contaminated soil and either removal of the soil form site or placing it back after land farming on site followed by groundwater remediation.
Haskoning, 2007, report number 9S5964	Actualization of groundwater assessment of the 1995 IGN investigation	Groundwater: one strong contamination with mineral oil. Other samples: no to moderate contaminations with mineral oil, VOCL or volatile aromatic compounds
Haskoning 2008, report number 9T7283	Two small parts of the site were investigated	Soil: one of the investigated sites contained strong contamination with PCB's in the subsoil. Further only light contaminations. Groundwater: light contaminations with metals, benzene, xylenes and tetrachloroethylene.
Haskoning 2019, report number BG8479IBRP1910181025	Only topsoil and 7 groundwater samples were tested	Soil: Topsoil on northeast side contains strong contaminations with metals and/or PCB, some asbestos was found. Groundwater: In one monitoring well (out of 7) a moderate contamination with VOCL was found. In the other groundwater samples only slightly increased levels were found.

Investigation	Information	Conclusion*
Further soil investigation, Antea Group, report number 465250.100, December 2020	The previously demonstrated soil and groundwater contaminations have been investigated in more detail and delineated. The potential for biodegradation of VOCL was also examined.	Soil: In the topsoil of the site, various heterogeneous contaminations with heavy metals, asbestos, PCB and/or mineral oil have been demonstrated and delineated. Groundwater: In the groundwater, various contaminations with mineral oil and VOCL have been detected and largely delineated.

*: Light contamination means above back ground level (AW); strong contamination means above intervention value (I); moderate contamination means above ½(AW+I).

Below, the contamination situation as described in this soil survey is summarized and, where relevant for the present remediation, supplemented with any relevant data from previous surveys.

Existing decision

On 12 October 1999, the Dutch Province of South Holland took a decision by which a plan of action was approved (reference ZH 482/097/805).

The decision concerns the planned remediation of a soil and groundwater contamination with mineral oil and VOCL at Building Y18. Subsequently, as far as is known, a remediation was carried out. The competent authority does not have any further information on this.

Contamination situation

Oil contamination in borehole 13, building Y1

In the exploratory survey of June 2020, a strong oil contamination was measured in borehole 13 from 0.1 to 1.5m BGL. No oil contamination was present at 1.5m BGL. The local groundwater is at most slightly contaminated with mineral oil.
At the location of this contamination, clear oil stains on the pavement (clinkers) are visible. On the basis of the analysis results and the oil stains on the pavement found in the field, the extent of the strong soil contamination is estimated at approximately 15m³ (10 m² x 1,5m). The contamination is historical (no recent releases known) and due to the former activities on site.

Oil contamination in borehole 9, building Y9

In the exploratory survey of June 2020, a strong oil contamination was measured in borehole 9 from 0.6 to 1.5m BGL. No oil contamination was present at 1.5m BGL. Based on the surrounding drillings and field observations the extent of the strong soil contamination is estimated at approximately 20m³ (20 m² x 1,0m).

Oil contamination in borehole a5, buildings Y17/Y18

In the exploratory survey of June 2020, a strong oil contamination was measured in borehole a5 from 0.7 to 0.9m BGL. A slight oil contamination was present at 1.5m BGL. In the present survey, at most slight oil contaminations were measured in the surrounding boreholes (500 to 503; 0.5 to 1.1m BGL). The strong soil contamination with mineral oil is thus delineated and is estimated to be less than 10m³.
No mineral oil was measured in the groundwater from monitoring well a5. Approximately 5m to the west, a strong oil contamination was identified in the groundwater from monitoring well 501. This contamination is probably related to the high level of soil contamination in a5 and, given the results for monitoring wells a5, 502 (2020 survey) and 97 (2019 survey), is expected to be limited in volume.

Fuel-related observations were also made at about 20m southeast of borehole a5 (boreholes 515 and 1016). Analysis results show that this soil has at most a moderately increased level of mineral oil.

The contamination is historical (no recent releases known) and due to the former activities on site.

Oil contamination at bfoto3 borehole, building Y7

Some fuel-related observations were made in the soil in this location. In boreholes 504 (located next to 'bfoto3' borehole), 505 and 509, strongly increased mineral oil levels were measured between approximately 0.6 and 1.3 to 2.0m BGL. In the surrounding boreholes outside the building, at most slightly increased levels of mineral oil were measured. In the building, this contamination is bounded by a basement at a distance of about 3m from the facade. Based on this, the soil contamination with mineral oil has been delineated both horizontally and vertically. Based on the field observations and analysis results, the volume of this soil contamination is estimated at approximately 15m³ (20m² x 0.75m).

The local groundwater is at most slightly contaminated with mineral oil.

Near the contamination the same oil was found on the floor inside the building. There seems to be a relation and the contamination appears to have arisen recently. Due to this duty of care applies here.

Oil contamination at building Y34 ('NAPL layer')

During the exploratory survey of June 2020, a strong oil contamination was measured in borehole 41 (1.4-2.6m BGL). At 2.6m BGL, a moderate contamination was present. In the present survey, at most slight oil contaminations were measured in the surrounding boreholes (510, 511 and 513). No borings were carried out along the side of the building because the concrete floor could not be penetrated (> 50cm thick; discontinued several times). Based on the expected westerly/northwesterly flow direction of the groundwater, an additional borehole, no. 514, was placed. In this borehole no fuel-related observations were made, which delineates the heavy soil contamination with mineral oil, and the volume is estimated at approximately 30m³ (25m² x 1.2m).

In the groundwater from monitoring well 41, an NAPL layer was found, and the groundwater contains a strong mineral oil contamination. In the surrounding monitoring wells (510, 511, 41H and 513), at most slightly increased levels of mineral oil were measured. The groundwater contamination is thus sufficiently delineated and is expected to have roughly the same volume as the soil contamination (approximately 30m³). Under the Soil Remediation Circular, an NAPL layer requires in principle urgent remediation. However, it can be sufficiently demonstrated that the contamination remains within the boundaries of the plot, and that there is little potential for spreading.

The contamination is historical (no recent releases known) and due to the former activities on site.

Mapping of heavy metals (immobile contaminants)

In various soil samples, not increased to strongly increased levels of various heavy metals (mainly copper and, locally, nickel) were read. The measured levels can, in part, be related to the admixtures with rubble, debris etc. found. Also, the strong contamination is locally present in the subsoil. In the soil samples from boreholes 516, 517, 518, 524, 526, 528a, 529, 543, 544 and 548, not increased to moderately increased levels of heavy metals were measured. Within the contour of this heterogeneous contamination with heavy metals, (immobile) strong contaminations with mineral oil and/or asbestos were also detected locally in the topsoil. Because these contaminants are immobile in nature and no significant earth movement has taken place, previous surveys are also considered to be representative.

The volume of the heavy metal contaminations in the topsoil is estimated at approximately 14,000m³ (18,750m² x 0.75m). Locally within this contour, there are also strong contaminations with asbestos and mineral oil.

The contamination is due to elevating the site and therefore historical.

PCB contamination of topsoil at building Y40

In a previous survey (Haskoning, 2020), a strongly increased PCB level was measured in a composite sample from the topsoil. Verification boreholes 520 and 523 show that in borehole 520 a moderately increased PCB level was measured, and in borehole 523 a slightly increased level. In the surrounding boreholes, no to slightly increased levels were measured. Based on the present survey, it can be stated that a not to moderately increased PCB level is concerned, and that any strong contamination will be very limited in volume.

PCB contamination of topsoil at building Y9

In a previous survey (Haskoning, 2008), a strongly increased PCB level was measured in a composite sample from the topsoil. The verification boreholes 530, 531 and 532 show that a strongly increased level of PCB was only measured in the topsoil of borehole 530. In the other two boreholes, the surrounding boreholes and in the subsoil (530a), slightly increased levels were measured, With this, the strong contamination in the soil is delineated and has a limited volume (estimated at 5m³ (10m² x 0.5m)).

The contamination is historical (no recent releases known) and due to the former activities on site.

VOCL contaminations

During the exploratory survey of June 2020, strong contaminations with VOCL were measured at three locations. The more detailed survey shows that two contamination cores are concerned.

In the central section of the site (monitoring wells 1015, 41) a contamination with tetrachloroethene or perchloroethene (PCE) and cis-1,2-dichloroethene was identified in the shallow groundwater (2.0-3.0m BGL). In the nearby monitoring wells bfoto5, 506 to 511 and 513, at most slightly increased levels of VOCL were measured. In the groundwater layers of 5 to 6m BGL and 9 to 10m BGL, no increased levels of VOCL were found. It is noted that at the former source area (well 1015) only PCE is found in relatively low levels (xxx µg/l or 1.83 x I-value (I value

is measure of a strong contamination). The current levels of PCE are comparable to the levels found in 1995.
In well 41 only the degradation product dichloroethene was found (xxx µg/l or 1.85 X I-value). In all the wells to the west and northwest, at most slightly increased levels of VOCL were measured very locally.
Based on this it can be concluded that downstream degradation is already taking place and the contamination is sufficiently contoured on site. Based on the concentrations measured in 2020 (comparable to the levels in 1995) and ongoing biodegradation it can be stated that this VOCL contamination can be considered to be stable and (risk based) requires no further remediation.
The volume of this VOCL contamination is estimated at approximately 5,000m³ (1,250m² x 4m).

In the southern section of the site, the phreatic monitoring well a4 of the exploratory study of June 2020 showed a strong contamination with PCE.
In monitoring wells 1012 and 1013 (downstream of the remediation locations Y17/18, placed near the a4 location), strong contaminations with PCE, trichloroethene (TCE), dichloroethenes, 1,1-dichloroethane and/or vinyl chloride were measured down to 10m BGL. Pure product is assumed to be present here. These monitoring tubes are located 4m outside building Y9, and a direct relationship with a possible local source is unclear.

The analysis results show that at the former remediation location near (former) buildings Y17 and Y18, the groundwater contains at most lightly increased levels of VOCL (monitoring tubes 515 and 1016). No VOCL was measured in the water from the local oil-petrol separator. In monitoring tube 1017, situated between the potential source location and monitoring tubes 1012, 1013 and a4, at most lightly increased levels of divinyl chlorides or vinyl chloride were measured.
Downstream, near the western boundary, in monitoring tubes 1009 and 1018 (at about 1m from the western boundary of the plot), strong contaminations with divinyl chlorides and vinyl chloride and a lightly increased level of 1,1-dichloroethane were measured at 9-10m BGL.

In the other analyzed groundwater samples, at most lightly increased levels of VOCL were measured very locally.

It is concluded that no clear former source can be identified for this VOCL contamination. It is clear however that the source is no longer present due to the fact that the activities have been stopped.
Furthermore there is a distinct decrease in VOCL concentrations from 6 to 10m BGL and in monitoring tubes 1009 and 1018 only degradation products are present. Due to the predominant groundwater flow direction in the deeper package (west-northwesterly) and the analytical results from the groundwater in de monitoring tubes on the western boundary it can be stated that the contamination is spread in a quite narrow area. Based on this spreading of the contamination in southerly direction is also expected to be limited.

Based on this, the volume of this VOCL contamination is estimated to be at least 25,000m³ (soil volume) of strongly contaminated groundwater (2,500m² x 10m). It is concluded that a case of serious groundwater contamination is present for which remediation measures are required.

Both VOCL contaminations are historical (no recent releases known) and due to the former activities on site.

For the contaminations with immobile components (heavy metals, PCB, asbestos) it can be stated in advance that remediation thereof will not be urgent on the basis of occurrence (only in the topsoil) or the current and / or intended use of the location (paved). For the other contaminations (oil and VOCL) it has been determined whether it is urgent or not to take remedial measures (Sanscrit assessment). The corresponding Sanscrit assessments are included in Appendix 3.

Table 2 below provides an overview of the contamination situation. In the table it is also noted if the contaminations are recent (duty of care), historical and if remedial measures are urgent.

Table 2: Overview of contaminations

Site section/Component	Delineated	Estimated volume of strong soil contamination (m^3)	Estimated volume of strong groundwater contamination (m^3)	Historical or Duty of care ?	Urgent ?
Contaminations with heavy metals, mineral oil and asbestos in topsoil	Yes	14,000	N/A	Historical	No
PCB contamination at building Y9	Yes	5	N/A	Historical	No
Strong subsoil contamination with oil, bfoto3 location, building Y7	Yes	15	N/A	Duty of care	Yes
Strong subsoil contamination with oil, drilling 13, building Y1	Yes	15	N/A	Historical	No
Strong subsoil contamination with oil, drilling 9, building Y9	Yes	20	N/A	Historical	No
Strong soil and groundwater contamination with oil at building Y34 (NAPL layer)	Yes	30	30	Historical	Yes
Strong subsoil contamination with oil, borehole a5, buildings Y17/Y18	Yes	< 10	50	Historical	No
Groundwater contaminations with VOCL, area Y6, Y34, Y38, Y39	Yes	N/A	5,000	Historical	No
Groundwater contaminations with VOCL, area Y5, Y9, Y17, Y18	Roughly	N/A	25,000	Historical	Yes

The contamination situation is shown on drawings 465250.100-VS2, VS3, -VS4, -VS5 and -VS11. An overview of the overall contamination situation on the cadastral map is shown in drawing 465250-KD1.

Remediation need and framework

Most contaminations were caused by the industrial use of the site and anthropogenic influences and came into being before 1987. The reference criterion for a case of serious soil contamination under the Soil Protection Act, i.e., 25 m^3 heavily contaminated soil or 100 m^3 soil volume of heavily contaminated groundwater, is exceeded for several contaminants.

Based on the available results, the volume of the main VOCL contamination (area Y5, Y9, Y17, Y18) is estimated to be approx. 25,000 m^3 (soil volume) of strongly contaminated groundwater (2,500 m^2 x 10,0m). As this is a case of serious groundwater contamination, it is necessary to check whether an unstable situation is concerned. This is the case if:

- An NAPL layer or sink layer is present;
- More than 6,000m^3 (soil volume) of groundwater is strongly contaminated and the annual increase in volume is more than 1,000m^3.

With this, consideration must also be given to whether a vulnerable receptor is under threat.

Based on the above, the mineral oil contamination at well 41 (floating layer) and the southern VOCL contamination require urgent remediation because an unstable situation may be concerned.
For the oil contamination at the location ‘bfoto3’a duty of care applies. Remediation therefore is also urgent.

For the other contaminations remedial measures are not urgent but will be taken in concurrence with the redevelopment.

It is concluded that it is necessary to take remediation measures in connection with the contemplated redevelopment.

2.3 Soil structure and geohydrology

The regional soil structure is shown in table 3 below. As a result of the location of the site outside the dike, the phreatic groundwater level depends strongly on the water level in the Noord, Nieuwe Maas and the Lek. It can be assumed that at high water levels in the river a horizontal flow of water from the river takes place towards the site. The flow rate depends on the density of the clay covering of the dike. This situation is reversed at low river levels. As a result, the resulting flow of the phreatic groundwater in the horizontal direction will be limited.

Table 3: soil structure

Global depth (m)	Geohydrological unit	Lithostratigraphic unit	Lithological composition
0-12	coating	Westland formation	clay and peat with silt-containing fine and coarse sands
12-37	first aquifers	Formation of Sterksel Kreftenheye and Kedichem	moderately coarse to coarse gravel-containing sands with clay layers

The influence of the Noord and Nieuwe Maas with ebb and flow on groundwater flow is rather large (in April 2020, in a relatively dry season in NW Europe, the water level on-site was recorded between 0.5 and 1.2 m bgl). In winter there will be a much higher water level. It is expected that there will always be an infiltrating effect from the Noord to the surrounding area.
The groundwater can be found from a depth of approximately 1.4 m bgl and flows in a south-western direction towards the lower lying polders/agricultural lands.

The site is located in a designated business area. As the crow flies approximately 1.5 km to the west northwest there is a groundwater abstraction well. The groundwater is abstracted at a depth from 30 m bgl. Due to groundwater abstraction well the groundwater flow direction in the first aquifer is oriented west northwest.

The geohydrological information comes from the Groundwater Map of the Netherlands, from the TNO Groundwater Survey Service, Gorinchem, 38 West, July 1979.

The site is located in a drilling-free zone of the environmental protection area for groundwater Krimpenerwaard / Alblasserwaard and near a groundwater protection area.
It is prohibited to drill wells without a permit or permission. It is also forbidden to make holes or to perform excavation work deeper than 2.5 meters. The remediation work will be carried out within the existing establishment. Based on this, it is not necessary to apply for an exemption or a permit.

2.4 Cables and lines

As a result of the discontinuation of the business activities and the intended demolition of the current buildings, the existing cables and lines have been or will be disconnected. Possible exceptions to this are the cables and line near the northern boundary of the site. Based on the identified contamination situation, these are not expected to constitute an obstacle to the execution of the remediation measures.
A KLIC (Dutch Cable and Pipeline Information Centre) notification was made for the recent soil survey. An overview of the location of the cables and lines is shown in the drawing in Appendix 2.

3 Remediation plan

3.1 Remediation policy

General

According to the Dutch Soil Protection Act, as amended on 1 January 2006, the (new) remediation objective is function-oriented. The changes have been fleshed out in more detail in the 2013 Soil Decontamination Circular.

Function-oriented remediation means that the end result is geared to the use or future use of the soil or to the removal/elimination of risks. With that, it is not always necessary to remove all contaminations up to the AW2000 levels (AW: background values).

The basic point of departure is an integrated approach (soil AND groundwater) to the overall soil contamination case. In principle, a standard approach applies. Customization per case or area will however be possible.

Standard approach to the topsoil

The standard approach is based on the interruption of human and ecological exposure pathways by making the contact/cover layer of the soil suitable for the use or intended use. The quality that the cover layer must comply with is laid down in the so-called "soil function classes". Three soil function classes are distinguished. These are shown in the table below.

Table 3.1: Classification into soil function classes, and soil standard name

Derived soil standard for ongoing suitability	Soil functions forming one soil function class
1. Background values	- Agriculture - Nature - Kitchen gardens/Allotments
2. Maximum residential value	- Residential with garden - Places where children play - Green space with natural values
3. Maximum industrial value	Other green spaces, buildings, infrastructure, industry

In the present case, the future situation on the remediation site will be a Type 3 soil use.

Standard approach to subsoil

The standard approach to the subsoil and groundwater is aimed at the removal of contaminants up to a level that will require as little aftercare as possible. The remediation objective may be determined on the basis of cost-effectiveness.

The present situation concerns a case of mobile contamination with mineral oil and VOCL in the subsoil. As the business activities have been discontinued, there are no longer any ongoing flows as sources of contamination. At the core of the VOCL contamination, the levels measured indicate the presence of pure product. In the plume zone, only dissolved degradation products were measured.

3.2 Choice of options

Remediation techniques

As for possible remediation techniques for soil contaminations, a general distinction can be made between excavation and in-situ remediation methods. In-situ techniques are in principle applicable to contaminants that are physically, chemically or biologically removable or degradable. The present case concerns a VOCL contamination. For the contamination with immobile components such as heavy metals, asbestos and PCB and the mobile contaminations with mineral oil, only the removal of the contamination by means of excavation or the covering of the contamination qualify as remediation techniques.

Remediation option

In the present situation, the remediation will be carried out in conjunction with the redevelopment. At the future buildings and the roads with parking spaces, the contamination with immobile components will be isolated (underneath pavements).

The mobile contaminations with mineral oil in the subsoil will be remediated by means of excavation, which will be carried out after the demolition of the buildings. To be able to excavate "in the dry", well-point dewatering will also be used where necessary.

With regard to possible remediation techniques for the contamination with chlorinated hydrocarbons, a general distinction can be made between excavation and in-situ remediation methods.

In-situ techniques are in principle applicable for mainly chemically or biologically removable or degradable contaminants. In principle, soil contamination with VOCl can be remediated in-situ (physical, chemical and / or biological). For the remediation plan a distinction must be made in chemical reduction (plume) or in situ chemical oxidation (ISCO) to remediate the source area.

Biological

From the current picture of the contamination, it can be concluded that the size of the contamination has decreased in time except for the source area on the southern part of the site. Due to the presence of cis-1,2-dichloroethene and vinyl chloride, it has been concluded that natural degradation takes place of the original products tetrachlorethylene (PCE) and trichlorethylene (TCE). Co-metabolism is expected at the site. Co-metabolism means that a micro-organism uses a compound for food and thereby “accidentally” breaks down another compound with a similar structure (eg chloroethenes). In this way, the PCE present breaks down into TCE, cis 1,2-dichloroethene (cDCE), vinyl chloride (VC) and ethylene (and ethane and methane).

At the site, the naturally occurring organic matter in the groundwater (DOC) could serve as a substrate (food). For the assessment of the natural degradation of chlorinated solvents, the aerobic or anaerobic conditions were determined. Within aerobic conditions degradation of tetrachloroethylene (PCE) is impossible but there are no indications that aerobic conditions will occur at this site. The analysis of the redox parameters shows that the conditions in the source and plume are anaerobic (sulphate-reducing / methanogenic). Under these conditions, the complete degradation of PCE can take place through the various intermediate steps to the harmless ethylene and ethane. That this also takes place is shown by the high levels of methane. Substrate is also needed for the breakdown of PCE. There is naturally enough dissolved organic

matter (DOC / TOC) in the soil to serve as a substrate. The acidity (pH) is in all cases well within 5.5 and 8.5, which is a precondition for natural degradation.

Chemical

A chemical approach is possible for the plume area as well for the source area. In principle, a VOCl contamination can be tackled by means of chemical reduction. Chemical reduction is usually applied by injection of reducing compounds. The most commonly used reductor is zero-valent iron. It is usually applied in the form of permeable reactive screens, permeable reactive barriers (PRB). The reducing material in a PRB usually consists of granular Fe (0).
However, this in situ approach is considered very expensive although the use of micro Fe is much cheaper instead of using nano Fe. With this technique there is a risk of settlement due to the decomposition of organic matter. Due to the poor permeability of the soil, it is also expected that the zero-valent iron cannot reach the entire contamination.

In-situ chemical oxidation (ISCO) involves introducing a strong oxidizing agent into the soil as a solid, diluted with water or together with air. When the oxidant in the soil comes into contact with the contamination, it is chemically broken down (oxidized) to harmless compounds including water, carbon dioxide, chloride and sulphate. Due to the latest results of the soil investigation no source area has been defined. Chemical reduction will be carried out at the site.

Approach

The remediation approach is threefold:

Immobile contaminations (mostly topsoil) with heavy metals, asbestos, mineral oil and PCB

These contaminations will be covered by a pavement (building and parking spaces). The starting point is that any soil excavated during construction will be rearranged around and near the location of origin.

Mobile contaminations with mineral oil

The contaminations with mineral oil in the subsoil (present in the soil and/or the groundwater) will be remediated by means of excavation, which will be carried out after the demolition of the buildings. To be able to excavate "in the dry", well-point dewatering will also be used where necessary. The combination of excavation and well-point dewatering is expected to remediate the soil and groundwater contaminations simultaneously. As post-remediation value for these oil contaminations, the maximum value for the current and intended Industrial use is chosen.

Mobile southern contamination with VOCL

The known data show that the conditions are favourable for natural degradation (sulphate-reducing / methanogen). Increasing concentrations within a period of several decades are not expected to occur. However, spreading of the contamination beyond the site boundaries cannot be ruled out completely.
The degradation process can be optimized by creating favourable soil conditions. A carbon fiber source (Dissolved Organic Carbon or DOC), such as molasses or vegetable oil, is added to the soil. It should be noted here that the use of vegetable oil can lead to odor nuisance. Increasing the DOC to 50 mg/l will accelerate natural degradation. To further stimulate natural degradation, some nutrients (N and P) can also be added (3 to 5 kg N and P) in addition to the carbon source (molar ratio C:N:P: 250, 10 and 5).

The soil structure, clayey top layer up to approx. 10 m below the surface area, is less suitable for substrate injection. The area of influence is considered to be very small. For this reason a rather intensive grid of injectionfilters has been designed.

The surface of the core of the contamination is approximately 750 m^2. Assuming an average concentration of PCE and TCE of 20 mg/l, the total load in the groundwater is approximately 150 kg of PCE and TCE. Not much data is available about contamination in the soil. A total of 100 kg is assumed in the ground phase as residual product. The total load to remediate is roughly estimated about 250 kg of PCE and TCE.

For area A (see figure 1) it is proposed to apply a DOC source by permanent injection filters. The injection is carried out in a grid of 4 by 4 meters. Assuming a surface of 100 m^2, a total of 7 injection points are needed. The injection depth is 7 to 15 m bgl for area A. A total of five filters have a depth of 7 to 10 m below the surface. The other two filters have a filter depth of 10 to 15 m below the surface. Due to the much higher permeability of the deeper layer, far fewer filters are required. Currently, research is still underway into the contamination situation and the spreading risks for groundwater deeper than 10 m below the surface. This is therefore not part of the remediation plan. The results are expected in the 1st quarter of 2021.

For area B it is proposed to apply a DOC source by permanent injection filters. The injection is carried out in a grid of 4 by 4 meters. Assuming a surface of 270 m^2, a total of approximately 22 injection filters are needed. The injection depth is 2 to 15 m bgl for area B. About 16 filters have a depth of 2 to 10 m below the surface. The other six filters have a filter depth of 10 to 15 m below the surface. The results of the deeper groundwater are expected in the 1st quarter of 2021.

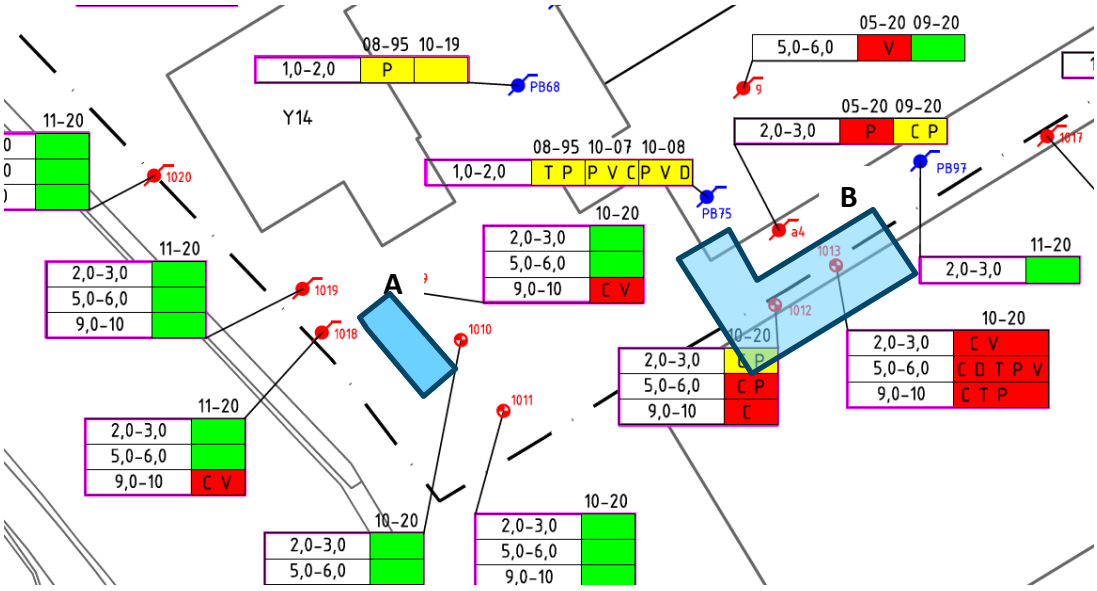


Figure 1: Area A and B

For areas A and B, a total of approximately 15 kg and 55 kg of DOC must be injected in total. When molasses is used with approximate 40% DOC, 40 kg and 140 kg molasses must be used.

The amount of molasses must be dissolved in water and injected as evenly as possible over the different filters. The use of permanent filers makes it possible to carry out a second injection round in the long term, whereby the amount of DOC to be injected is related to the results of the first injection rounds.

The injection wells at area A must be situated between the monitoring wells 1009 and 1018. Monitoring well 1009 is used to monitor the incoming concentrations of VOCl, while monitoring well 1018 checks the effectiveness of the remediation measure. For area B, the progress of the remediation is checked on the basis of the existing monitoring wells a4, 1012 and 1013.

Phasing

The remediation work will be carried out in phases. With this, the contemplated demolition and new construction determine the implementation of the various steps. During the demolition and new-build phases, the contaminations with mineral oil, heavy metals, PCB and asbestos will be remediated. Also, the remediation of the VOCL contamination will be started. Upon completion of the new-build phase, the monitoring of this remediation will be continued for 2 years.

Where applicable, the construction of the new cable and line routes will also be taken into account during the works. The exact route of the new gas and voltage lines is not yet known.

3.3 Preconditions and starting points

The following preconditions and starting points are used in elaborating the remediation measures:

A. The soil decontamination policy as formulated in the 2013 Soil Decontamination Circular (Government Gazette, July 2013).
B. The current contamination situation does not differ significantly from the situation established on the basis of the previous soil surveys and is described in section 2.2.
C. The area where the contaminations are located will get an 'Industrial' function.
D. The remediation will be carried out in conjunction with the demolition and redevelopment of the site.
E. The future ground level will be equal to the current ground level.
F. The immobile contaminations will be isolated by applying isolation layers.
G. The mobile contaminations with mineral oil will be remediated to levels below the intervention values or (in a vertical sense) down to a maximum of 2.6m BGL.
H. The southern mobile pollution with VOCL will be remediated by stimulating biodegradation. The remediation will be monitored for a period of 2 years.
I. Backfilling the excavation(s) and levelling the ground level will be carried out as much as possible with on-site soil that will be rearranged. Also, any soil to be supplied must, as a minimum, comply with the Industry class in accordance with the Dutch Soil Quality Decree.
J. Some of the remediation works are expected to require dewatering. With regard to the quality of the discharge water, the discharge requirements that apply to discharges to surface water have been taken as a starting point.
K. The nature of the measures will be such that nuisance and inconvenience during their implementation, and possibly afterwards, will be limited as much as possible.
L. The risk of damage to capital goods and public roads (buildings, cables, lines, etc.), both on site and in the vicinity of the site, must be minimized.

3.4 Preparatory works

Permits and permissions

In order to carry out the remediation works, the following permits and approvals will have to be arranged:

- Obtaining approval for the remediation plan from DCMR;
- Reporting the groundwater extraction to the Waterschap Hollandsche Delta (water board) and/or DCMR;
- Reporting the discharge of drainage water to the waste water sewer system to Waterschap Hollandsche Delta and/or DCMR.

To be done by the contractor:

- Making a KLIC notification;
- Obtaining permission to deliver contaminated soil to a processing plant.

Facilities

Before the remediation can be started, the following facilities must be in place:

- Eating/dressing/washing spaces for use by all persons working on site.
- It must be possible to close off the working area during the remediation period.
- Sufficient foil or containers for temporary storage of excavated soil, if necessary.
- Brushing/washing area to clear the equipment of contaminated soil when leaving the work area.
- Water treatment plant of sufficient capacity to meet discharge standards.

3.5 Excavation plan

General

During the remediation, the soil will have to be excavated based on the instructions of an environmental supervisor, who will distinguish between different batches based on the known data and any field observations. Any excavated contaminated soil will be transported to a licensed processing plant. The excavated soil that may be reusable on-site will be stored in a depot and inspected indicatively to determine the possibilities for reuse or processing (see also §3.8 'control sampling'). Released rubble/foundation layers that may be reusable on-site will be stored in a depot and rearranged/reused in foundation layers to be laid underneath future pavements.

On site several contaminations are present. The contaminations with oil will be excavated and discarded from site. The topsoil immobile contaminations with heavy metals, oil and asbestos will not be excavated and/or will be isolated on site underneath the building or paving.
For the contaminations with VOCL no excavation is foreseen. Table 3.2. shows the soil balance.

Table 3.2: Soil balance

Description	Excavation (m^3)	Removal to licensed processing plant (m^3)	Reuse	Backfilling (sand)	Notes
Contaminations with heavy metals, mineral oil and asbestos in topsoil	-	0	-	-	Isolation underneath building and paving
PCB contamination at building Y9	5	5	-	5	Excavation and removal after demolition
Strong subsoil contamination with oil, bfoto3 location, building Y7	15	15	-	15	Excavation and removal after demolition
Strong subsoil contamination with oil, drilling 13, building Y1	15	15	-	15	Excavation and removal after demolition
Strong subsoil contamination with oil, drilling 9, building Y9	20	20	-	20	Excavation and removal after demolition
Strong soil and groundwater contamination with oil at building Y34 (NAPL layer)	30	30	-	30	Excavation and removal after demolition
Strong subsoil contamination with oil, borehole a5, buildings Y17/Y18	< 10	< 10	-	< 10	Excavation and removal after demolition
Groundwater contaminations with VOCL, area Y6, Y34, Y38, Y39	0	N/A	-	-	Stable on site, bio degradation in progress
Groundwater contaminations with VOCL, area Y5, Y9, Y17, Y18	0	N/A	-	-	Stimulation of (bio)degradation, monitoring

Backfilling

For backfilling the excavations or creating the cover layer, use can in part be made of the clean on-site soil that will be rearranged. Soil/sand to be supplied must at least comply with the Industrial class in accordance with the Dutch Soil Quality Decree.

With regard to any backfill, temporary relocation or application of soil outside the site, the following also applies:

- Application of soil outside the site: Any application of soil from outside the remediation site must take place in accordance with the Soil Quality Decree ("*Bbk*").
- When temporarily relocating soil within a remediation site, the soil must be placed back (unprocessed) under the same conditions. Placing back soil (including Industry-class soil) is permitted, provided this is done under the same conditions (Art. 36.3, *Bbk*):
- The temporary movement or removal of soil or dredge spoil from the site is permitted, without regard to Articles 38 to 64, if it is subsequently re-applied in that site, without having been processed, on or near the same spot and in the same condition.
- In any case, the isolation layer in the form of a cover layer must comply with the Industrial class (upper metre), which will require an acknowledged certificate of quality. If soil within the remediation site is to be used as part of the cover layer to be applied, such soil must be inspected according to AP04.

Cables and lines

The site houses various cables and lines. These will be de-energized (electricity and data) or shut off (gas, water and sewer) prior to the demolition phase. Where applicable, these cables and lines will be removed during the remediation phase.

3.6 Processing of excavated soil

During the remediation phase, only the strong soil contaminations with mineral oil will be excavated from the subsoil. This concerns sandy and clayey soil contaminated with mineral oil at 4 site sections (a4, 13, 41, and bfoto3/504). This contaminated soil will be removed and transported to a licensed processing plant. The total volume is estimated at approximately 90 m^3 of strongly contaminated soil.

3.7 Groundwater measures

The excavation work is carried out with dry conditions for the soil. For this purpose groundwater must be temporarily extracted. In view of the clayey soil, drains or pump will be sufficient. The flow rate is low and estimated at less than 5 m3/hour, except for the first stage lowering the groundwater level. At the location of the floating layer with mineral oil, the pure product will be selectively removed with the appropriate equipment. Dissolved heavy metals above the discharge standard may be found in the groundwater for the other locations. A sand filter with backwash facility is used for purification. In case of high levels of mineral oil an oil separator will be used.

3.8 Environmental supervision, safety and evaluation

Environmental supervision

The activities at the strongly contaminated areas must be carried out under environmental supervision in accordance with BRL 6001. The environmental expert should, among other things, supervise the excavation method and the different soil streams and also indicate the contamination boundaries.

In addition, compliance with the safety regulations applicable to the work will be supervised and, where necessary, air quality measurements shall be taken for monitoring purposes. However, the contractor remains responsible for the safety at work.

In addition, the tasks of the environmental expert include:

- Supervising the excavations;
- Checking the separation of the batches to be excavated according to their nature and degree of contamination;
- Designating and monitoring the depots where excavated soil is to be stored according to the presumed contamination class;
- Supervising compliance with the applicable safety regulations;
- Taking control samples;
- Inspecting any backfill materials to be supplied from outside the site;
- Collecting data and keeping a logbook for the evaluation report to be drawn up;
- Overseeing the backfill;
- Reporting deviations and any consequences thereof to the management.

Control sampling

Application of cover and isolation layers

Residual contaminations will remain underneath the isolation layers to be applied. For this reason, control sampling will not be necessary. If, in parts of the site, there is no residual contamination, it may be worthwhile to determine the quality underneath the isolation layer in order to partially remove any restrictions on use, aftercare and cadastral entry. For the time being, this has not been assumed in view of the remediation objective.

Mineral oil contamination

For the remediation of the mineral oil, the intervention value is used as post-remediation value. To verify the remediation result, the excavation should be inspected in accordance with SIKB BRL6001 (mobile contamination strategy, mineral oil remediation parameter). The following control samples should be considered:

- Well bottom: per maximum area of 50 m^2 (about 4 pcs);
- Well wall: per maximum area of 25 m^2 and maximum layer thickness of 1m (approx. 10 pcs).

At the oil contaminations (4 site sections), a monitoring well will be placed in the excavation to verify the quality of the groundwater after the remediation. The groundwater will be sampled at least one week after the placement.

VOCL contaminations

A few weeks prior to the injection, the groundwater from the existing filters will be sampled and analysed for VOCL and DOC. Subsequently, this sampling will be carried out 3, 6 and 9 months, 1 year, 1.5 years and 2 years after the first injection. When the average DOC concentration in the monitoring wells drops below 10 mg/l a new injection of DOC must be carried out unless the contaminants' concentrations have already dropped to a significant extent. After 2 years, an evaluation report will be drawn up in which the results of the remediation are discussed. Remediation will be assumed to be successful if the concentrations remain the same or decrease. After the remediation phase, the site will switch to the aftercare phase, mainly with restrictions on use of the subsoil.

Checking the drainage water

To check the quality of the drainage water, control samples will have to be taken from the effluent. The number of control samples as well as the parameters to be analysed will have to be coordinated with DCMR and/or the Waterschap Hollandsche Delta water board.

Depot sampling

Depot sampling will be carried out indicatively on site and/or if necessary in accordance with the processing plant.

Safety

In order to be able to work safely during the execution of remediation works, safety classes have been drawn up, depending on the nature and degree of contamination. Six safety classes have been formulated (orange, red and black, each with a distinction between 'volatile' and 'non-volatile'). The safety classes are based on the potentially harmful effects of the contaminating components (SRCarbo values) on the one hand. And, on the other hand, these safety classes are

based on the chance that substances will reveal themselves to a high degree in the working environment as a result of volatility and/or limited ventilation.
Based on the known data and research results, the safety class Black - Volatile applies in accordance with CROW publication 400. The normative parameters are mineral oil, tetrachloroethene, vinyl chloride and trichloroethylene. Appendix 4 provides the calculation of the safety classes.

For the work at the asbestos contamination the safety class Black – non-volatile applies in accordance with CROW publication 400.

For the contaminations with heavy metals and PCB the safety class basic hygiene applies.

Measures during the execution

The measures to be taken in relation to the applicable safety class will be specified by the contractor and are to be laid down in an H&S plan for the execution phase. The measures to be taken are described in CROW132 or CROW400 and must be further determined by an expert (a medium or senior safety expert). The expert must at all times have been demonstrably involved in determining the package of measures and drawing up the H&S plan for the execution phase.

As part of the tendering procedure for the work, an H&S plan for the design phase will be drawn up by/on behalf of the client, in which plan the safety class and other safety risks to be expected from the design (constructional, technical and organisational choices) will be described in more detail.

Evaluation

Once the soil remediation of the immobile contamination and the remediation of the oil contaminations have been completed, an evaluation report will be drawn up which must meet the requirements of the competent authority. The topics discussed in the evaluation report will include:

- the activities carried out for remediation purposes;
- the final volumes of soil/materials removed, and their destination;
- the results of the chemical analyses (of soil and groundwater);
- a description of the post-remediation situation;
- quantity and quality of the discharged groundwater;
- safety at work.

The intended duration of the remediation of the VOCL contamination is approximately 2 years. After these 2 years, an evaluation report will be drawn up in which the results of the remediation will be discussed.

3.9 Aftercare

Restrictions on use

Strongly increased levels will remain underneath the durable isolation layers. If no inspection is carried out, it must be assumed that a residual contamination will remain, in which case the site will be subject to restrictions on its use. For example, no spontaneous excavations will be allowed on the site. The owner of the site shall be responsible for compliance with the restrictions on use.

If an excavation takes place in the contaminated soil (underneath the cover layer or underneath the isolating facility), or if the strong groundwater contamination is influenced in any way, a (partial) remediation plan or a notification under the Uniform Remediation Standards Decree ("BUS-melding") must be drawn up and submitted to the competent authority (DCMR) for approval.

Registration

Because of the strong residual contaminations remaining in the soil, the cadastral entry remains in force.

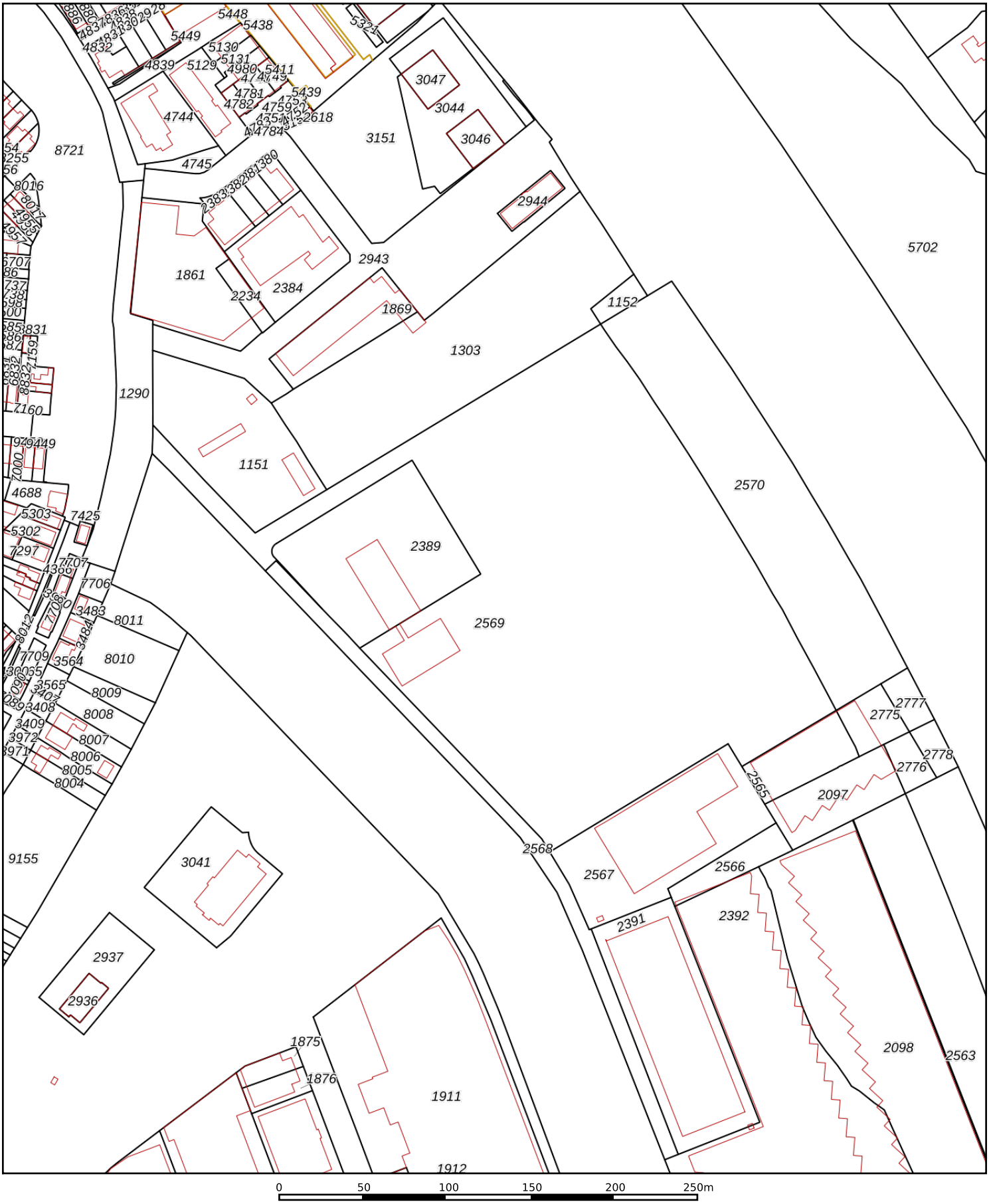
This means that the land register ("*Kadaster*") contains an entry that refers to a file kept by the competent authority under the Dutch Soil Protection Act ("*Wbb*") on the site, which file includes the remediation need/urgency, the decision on the remediation plan, and the decision on the evaluation.

Antea Group
Almere, February 2021

Appendices

Appendix 1

Cadastral information



Deze kaart is noordgericht

12345 Perceelnummer

25 Huisnummer

Vastgestelde kadastrale grens

Voorlopige kadastrale grens

Administratieve kadastrale grens

Bebouwing

Voor een eensluidend uittreksel, geleverd op 27 januari 2021
De bewaarder van het kadaster en de openbare registers

Schaal 1: 3000

Kadastrale gemeente	Ridderkerk
Sectie	B
Perceel	2569

kadaster

Aan dit uittreksel kunnen geen betrouwbare maten worden ontleend.
De Dienst voor het kadaster en de openbare registers behoudt zich de intellectuele eigendomsrechten voor, waaronder het auteursrecht en het databankenrecht.

OLIE GROND
VOCL GRONDWATER
OLIE GROND EN GRONDWATER
OLIE GROND
OLIE GROND
ZWARE METALEN GROND
OLIE GROND
OLIE GROND
ZWARE METALEN, ASBEST, PCB GROND
OLIE GROND
OLIE GROND EN GRONDWATER
OLIE GROND
VOCL GRONDWATER
B 2943
B 2384
B 1869
B 1303
B 1152
B 2389
B 2570
B 2569
B 2775
B 2565
B 2097
B 2567
B 2568
B 2566
B 2392
B 2391
B 2098
B 1875
396-396j
380
390a-390b
390e
390c
390d
366
360-372

0 10 20 30 40m

NR	DATUM	WIJZIGING	GET.
C0	02-02-2021	CONCEPT	M.H.

Panattoni

Overview contaminations on cadastral map

Tekeningnummer
0465250.100-KD1

Tekenaar
M. Heetland

Projectleider
A. Ooijevaar

Schaal
1:1000

Formaat
A2

1 IN 1

Status
INTERN

Wijz.nr.
C0

www.anteagroup.nl

anteagroup

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kadaster

BETREFT
Ridderkerk B 2389

UW REFERENTIE
465250

GELEVERD OP
27-01-2021 - 11:07

PRODUCTIEORDERNUMMER
S11088122689

VOLLEDIG GESIGNALEERD T/M
26-01-2021 - 14:59

VOLLEDIG BIJGEWERKT T/M
26-01-2021 - 14:59

Eigendomsinformatie

ALGEMEEN

Kadastrale aanduiding	Ridderkerk B 2389 Kadastrale objectidentificatie : 019390238970000		
Locaties	Ringdijk 390 a 2983 GS Ridderkerk Locatiegegevens zijn ontleend aan de Basisregistratie Adressen en Gebouwen Verblijfsobject ID: 0597010000235279		
	Ringdijk 390 2983 GS Ridderkerk		
Kadastrale grootte	7.380 m²		
Grens en grootte	Vastgesteld		
Coördinaten	102061 - 433174		
Omschrijving	Bedrijvigheid (industrie)		
	Terrein (industrie)		
Koopsom	€ 16.000.000 Met meer onroerend goed verkregen	**Koopjaar**	2020
Ontstaan uit	Ridderkerk B 2095		

AANTEKENINGEN

Publiekrechtelijke beperking Basisregistratie Kadaster	Er zijn geen beperkingen bekend in de Basisregistratie Kadaster.

RECHTEN

1 Eigendom belast met Zakelijk recht als bedoeld in artikel 5, lid 3, onder b, van de Belemmeringenwet Privaatrecht (zie 1.1) en Zakelijk recht als bedoeld in artikel 5, lid 3, onder b, van de Belemmeringenwet Privaatrecht op gedeelte van perceel (zie 1.2 en 1.3)

Soort recht	Eigendom (recht van)		
Afkomstig uit stuk	Hyp4 78604/7 Overdracht (eigendom en/of beperkt recht)	**Ingeschreven op**	24-07-2020 om 09:00
Naam gerechtigde	[redacted]		
Adres	[redacted] G		
Statutaire zetel			

1.1	**Zakelijk recht als bedoeld in artikel 5, lid 3, onder b, van de Belemmeringenwet Privaatrecht**		
Afkomstig uit stukken	Hyp4 67575/22	**Ingeschreven op**	11-01-2016 om 14:48
	Hyp4 10331/38 Rotterdam	**Ingeschreven op**	22-12-1988
Aanvullende stukken	Hyp4 69415/29 Is aanvulling op Hyp4 67575/22	**Ingeschreven op**	14-11-2016 om 09:00
	Hyp4 69120/136 Is aanvulling op Hyp4 67575/22	**Ingeschreven op**	30-09-2016 om 09:00
Naam gerechtigde	Stedin Netten B.V.		
Adres	Blaak 8 3011 TA ROTTERDAM		
Statutaire zetel	ROTTERDAM		
KvK-nummer	64930149 (Bron: Handelsregister) Voor de meest actuele naam, zetel en adres, raadpleeg het Handelsregister		
Vermeld in stuk	Hyp4 69270/00042 Naamswijziging rechtspersoon	**Ingeschreven op**	21-10-2016 om 09:00

1.2	**Zakelijk recht als bedoeld in artikel 5, lid 3, onder b, van de Belemmeringenwet Privaatrecht op gedeelte van perceel**		
Afkomstig uit stuk	Hyp4 4004/26 Rotterdam		
Naam gerechtigde	Gemeente Ridderkerk		
Adres	Koningsplein 1 2981 EA RIDDERKERK		
Postadres	Postbus 271 2980 AG RIDDERKERK		
Statutaire zetel	RIDDERKERK		
KvK-nummer	24493197 (Bron: Handelsregister) Voor de meest actuele naam, zetel en adres, raadpleeg het Handelsregister		

1.3	**Zakelijk recht als bedoeld in artikel 5, lid 3, onder b, van de Belemmeringenwet Privaatrecht op gedeelte van perceel**		
Afkomstig uit stuk	Hyp4 4453/17 Rotterdam		
Naam gerechtigde	Gemeente Dordrecht		
Adres	Spuiboulevard 300 3311 GR DORDRECHT		
Postadres	Postbus 8 3300 AA DORDRECHT		
Statutaire zetel	DORDRECHT		
KvK-nummer	50070525 (Bron: Handelsregister) Voor de meest actuele naam, zetel en adres, raadpleeg het Handelsregister		

Aantekening recht	Raadpleeg brondocument
Bijzonderheden	OUD NUMMER B 1002 EN B 1055
Afkomstig uit stuk	Hyp4 4453/17 Rotterdam

Voor een eensluidend uittreksel, de bewaarder van het kadaster en de openbare registers.
De Dienst voor het kadaster en de openbare registers behoudt ten aanzien van de kadastrale gegevens zich het recht voor als bedoeld in artikel 2 lid 1 juncto artikel 6 lid 3 van de Databankenwet.
Heeft u nog vragen? Neem contact op met de klantenservice.

kadaster

BETREFT
Ridderkerk B 2569

UW REFERENTIE
465250

GELEVERD OP
27-01-2021 - 11:05

PRODUCTIEORDERNUMMER
S11088122428

VOLLEDIG GESIGNALEERD T/M
26-01-2021 - 14:59

VOLLEDIG BIJGEWERKT T/M
26-01-2021 - 14:59

Eigendomsinformatie

ALGEMEEN

Kadastrale aanduiding	Ridderkerk B 2569 Kadastrale objectidentificatie : 019390256970000		
Locaties	Ringdijk 390 b 2983 GS Ridderkerk Locatiegegevens zijn ontleend aan de Basisregistratie Adressen en Gebouwen Verblijfsobject ID: 0597010000237359		
	Ringdijk 388 2983 GS Ridderkerk Verblijfsobject ID: 0597010000252285		
Kadastrale grootte	50.409 m²		
Grens en grootte	Vastgesteld		
Coördinaten	102099 - 433128		
Omschrijving	Bedrijvigheid (industrie)		
	Terrein (industrie)		
Koopsom	€ 16.000.000 Met meer onroerend goed verkregen	**Koopjaar**	2020
Ontstaan uit	Ridderkerk B 2390		

AANTEKENINGEN

Publiekrechtelijke beperking Basisregistratie Kadaster	Kennisgeving, vordering, bevel of beschikking, Wet Bodembescherming (zie tekening)		
Betrokken bestuursorgaan	Provincie Zuid-Holland		
Afkomstig uit stuk	Hyp4 59121/6	**Ingeschreven op**	17-11-2010 om 11:16

RECHTEN

1 Eigendom belast met Zakelijk recht als bedoeld in artikel 5, lid 3, onder b, van de Belemmeringenwet Privaatrecht (zie 1.1) en Zakelijk recht als bedoeld in artikel 5, lid 3, onder b, van de Belemmeringenwet Privaatrecht op gedeelte van perceel (zie 1.2 en 1.3)

Soort recht	Eigendom (recht van)		
Afkomstig uit stuk	Hyp4 78604/7 Overdracht (eigendom en/of beperkt recht)	**Ingeschreven op**	24-07-2020 om 09:00

Aanvullend stuk Hyp4 78715/21 [redacted]
Verbetering
[redacted]
G

1.1 Zakelijk recht als bedoeld in artikel 5, lid 3, onder b, van de Belemmeringenwet
Privaatrecht

Afkomstig uit stukken Hyp4 67575/22 **Ingeschreven op** 11-01-2016 om 14:48
Hyp4 10331/38 Rotterdam **Ingeschreven op** 22-12-1988
Aanvullende stukken Hyp4 69415/29 **Ingeschreven op** 14-11-2016 om 09:00
Is aanvulling op Hyp4 67575/22
Hyp4 69120/136 **Ingeschreven op** 30-09-2016 om 09:00
Is aanvulling op Hyp4 67575/22
Naam gerechtigde Stedin Netten B.V.
Adres Blaak 8
3011 TA ROTTERDAM
Statutaire zetel ROTTERDAM
KvK-nummer 64930149 (Bron: Handelsregister)
Voor de meest actuele naam, zetel en adres, raadpleeg het Handelsregister
Vermeld in stuk Hyp4 69270/00042 **Ingeschreven op** 21-10-2016 om 09:00
Naamswijziging rechtspersoon

1.2 Zakelijk recht als bedoeld in artikel 5, lid 3, onder b, van de Belemmeringenwet
Privaatrecht op gedeelte van perceel

Afkomstig uit stuk Hyp4 4004/26 Rotterdam
Naam gerechtigde Gemeente Ridderkerk
Adres Koningsplein 1
2981 EA RIDDERKERK
Postadres Postbus 271
2980 AG RIDDERKERK
Statutaire zetel RIDDERKERK
KvK-nummer 24493197 (Bron: Handelsregister)
Voor de meest actuele naam, zetel en adres, raadpleeg het Handelsregister

1.3 Zakelijk recht als bedoeld in artikel 5, lid 3, onder b, van de Belemmeringenwet
Privaatrecht op gedeelte van perceel

Afkomstig uit stuk Hyp4 4453/17 Rotterdam
Naam gerechtigde Gemeente Dordrecht

kadaster

BETREFT
Ridderkerk B 2569

UW REFERENTIE
465250

GELEVERD OP
27-01-2021 - 11:05

PRODUCTIEORDERNUMMER
S11088122428

VOLLEDIG GESIGNALEERD T/M
26-01-2021 - 14:59

VOLLEDIG BIJGEWERKT T/M
26-01-2021 - 14:59

Adres	Spuiboulevard 300 3311 GR DORDRECHT
Postadres	Postbus 8 3300 AA DORDRECHT
Statutaire zetel	DORDRECHT
KvK-nummer	50070525 (Bron: Handelsregister) Voor de meest actuele naam, zetel en adres, raadpleeg het Handelsregister

Voor een eensluidend uittreksel, de bewaarder van het kadaster en de openbare registers.
De Dienst voor het kadaster en de openbare registers behoudt ten aanzien van de kadastrale gegevens
zich het recht voor als bedoeld in artikel 2 lid 1 juncto artikel 6 lid 3 van de Databankenwet.
Heeft u nog vragen? Neem contact op met de klantenservice.

Appendix 2

Overview Cables and Pipelines

kadaster

KLIC-melding: **9812745218/10 20G535343 - 1** | Aanvraagdatum: **28-09-2020** | Blz 1 van 13

Verzamelkaart (alle thema's) | Status: **Levering compleet** | 28-09-2020 18:39

Stedin Netbeheer gas hoge
Stedin Netbeheer hoogspan
Stedin Netbeheer middenspa
Stedin Netbeheer distributie
Stedin Netbeheer gas lage
Stedin Netbeheer laagspann
Eurofiber Nederl. distributie
KPN B.V. distributienet
Oasen N.V. water
Tennet TSO distributienet
Tagger B.V. datanetwerk
Waterschap Hof Delfland



50 m

Appendix 3

Sanscrit assessment

Rapportage Sanscrit.nl

Instrument ter bepaling van spoedeisendheid van saneren

V. Sanscrit **2.7.2**
V. rapport **2.18**

Algemeen

Naam dossier: Ringdijk 390 VOCL 1013
Code:
Beoordelaar: [redacted]
Datum rapport: dinsdag 26 januari 2021
Type bodemgebruik: huidig

Uitgevoerde beoordelingen:

Stap1: Ernst van de verontreiniging:
Er is sprake van een geval van ernstige verontreiniging als gevolg van:
- Ernstige bodemverontreiniging

	Stap2: Standaardbeoordeling	**Stap 3:** Uitgebreide beoordeling
Humaan	✔	✔
Ecologisch	✔	▬
Verspreiding	✔	✔

✔ = voltooid ✘ = niet uitgevoerd ▬ = niet relevant op basis van uitkomst stap 2

Opmerkingen bij dossier:

Over Sanscrit

Sanscrit 2.0 is een geautomatiseerde versie van het Saneringscriterium. Het Saneringscriterium is beschreven in de Circulaire Bodemsanering 2013. De applicatie Sanscrit is ontwikkeld in opdracht van het ministerie van I&W.
Met het Saneringscriterium wordt bepaald of sprake is van onaanvaardbare risico's van bodemverontreiniging voor mens , ecosysteem of van het risico op verspreiding van de verontreiniging in het grondwater. Op basis van de bepaalde risico's wordt vastgesteld of een sanering met spoed dient te worden uitgevoerd.

Uitgangspunten
De sanering dient met spoed te worden uitgevoerd, tenzij op basis van de risicobeoordeling is aangetoond dat de sanering niet met spoed hoeft te worden uitgevoerd.
De werkwijze van het Saneringscriterium geldt voor:

- een geval van ernstige bodemverontreiniging;
- een historische verontreiniging. Voor verontreinigingen die sinds 1987 zijn ontstaan is artikel 13 van de Wbb (zorgplicht) van toepassing;
- huidig en voorgenomen gebruik;
- grond en grondwater. Voor waterbodem is een separate systematiek ontwikkeld, met uitzondering van asbest;
- alle stoffen waarvoor een interventiewaarde is afgeleid, met uitzondering van asbest. Daar asbest heel specifieke chemische en fysische eigenschappen heeft, is voor asbest separaat het 'Milieuhygiënisch saneringscriterium, protocol asbest' ontwikkeld hetgeen ook van toepassing is voor waterbodems . Asbest is dan ook niet opgenomen in het Sanscrit.

(Circulaire Bodemsanering, 2013)

Eindconclusie

(Een deel van) de locatie dient met spoed gesaneerd te worden als gevolg van:
- het feit dat onbekend is of verspreiding leidt tot onaanvaardbare risico's (op basis van stap 3)

Humane risicobeoordeling - Toetsresultaten

Per stof

Stof	Dosis [mg/kg lg/d]	MTR [mg/kg lg/d]	Risico-Index
Ander groen, bebouwing, infrastructuur en industrie			
Tetrachlooretheen	0	1,60e-2	0,00
Trichlooretheen	0	5,00e-2	0,00
Vinylchloride (monochlooretheen)	0	6,00e-4	0,00

Combinatietoxicologie

Stofgroep	Risico-index
Ander groen, bebouwing, infrastructuur en industrie	
VOCLs	0,00

Hinder - toetsing aan geurdrempels

Stof	Concentratie binnenlucht [ug/m3]	Geurdrempel [ug/m3]
Ander groen, bebouwing, infrastructuur en industrie		
Tetrachlooretheen	2,50e2	1,00e5
Trichlooretheen	5,38e1	5,00e4
Vinylchloride (monochlooretheen)	5,72e1	4,00e4

Hinder - huidcontact

Functie	Sprake van huidcontact?
Ander groen, bebouwing, infrastructuur en industrie	Nee

Toelichting:

Toetsing TCL's

Stof	Concentratie binnenlucht [ug/m3]	TCL [ug/m3]
Ander groen, bebouwing, infrastructuur en industrie		
Tetrachlooretheen	2,50e2	2,50e2
Trichlooretheen	5,38e1	2,00e2
Vinylchloride (monochlooretheen)	**5,72e1**	**3,60**

Let op: de overschrijding(en) van de TCL hebben geen invloed op het eindoordeel, omdat de blootstellingsroute 'inhalatie binnenlucht' is uitgeschakeld. Bij verandering van bodemgebruik is er mogelijk een risico door uitdamping.

Uitgebreid overzicht blootstelling

Blootstellingsroute	Relatieve bijdrage [%]
Ander groen, bebouwing, infrastructuur en industrie	
Tetrachlooretheen	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	0.00
Dermale opname buiten	0.00
Dermale opname tijdens baden	0.00
Ingestie grond	0.00
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00
Trichlooretheen	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	0.00
Dermale opname buiten	0.00
Dermale opname tijdens baden	0.00
Ingestie grond	0.00
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00
Vinylchloride (monochlooretheen)	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	0.00
Dermale opname buiten	0.00
Dermale opname tijdens baden	0.00
Ingestie grond	0.00
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00

Humane risico's - invoergegevens

Stof	C-totaal [mg/kg] Geheel	Bebouwd	Onbebouwd	C-grondwater [ug/l] Bebouwd	Onbebouwd
Ander groen, bebouwing, infrastructuur en industrie					
Tetrachlooretheen				1,00e1	2,10e5
Trichlooretheen				1,00e1	7,60e4
Vinylchloride (monochlooretheen)				1,00e1	6,80e3

Parameters

Functie	Berekening blootstelling lood:	OS [%]	Diepte verontreiniging [m] t.o.v. kruipruimte	t.o.v. maaiveld
Ander groen, bebouwing, infrastructuur en industr	Als kind	10,00	0,75	1,25

Humane risicobeoordeling - Parameters uitgebreide beoordeling

Let op: in dit onderdeel wordt een overzicht gegeven van parameters die afwijken van de standaardwaarden uit de stap 2 beoordeling. Parameters die niet zijn ingevoerd en/of afwijken van de standaardinstellingen verschijnen ook niet in dit overzicht.

Blootstellingsroutes

Blootstellingsroute	Status
Ander groen, bebouwing, infrastructuur en industrie	
Verantwoording: op basis van gebruik en voorkomen	
Dermaal contact bij douchen	Uitgeschakeld
Dermaal contact grond	Uitgeschakeld
Ingestie drinkwater	Uitgeschakeld
Ingestie grond	Uitgeschakeld
Inhalatie binnenlucht	Uitgeschakeld
Inhalatie buitenlucht	Uitgeschakeld
Inhalatie dampen bij douchen	Uitgeschakeld
Inhalatie grond	Uitgeschakeld

Ecologische risicobeoordeling - standaard

De verontreiniging bevindt zich NIET geheel of ten dele in de bovenste meter van de onbedekte bodem . Er is GEEN sprake van gewassen wortelend in verontreinigde bodem dieper dan één meter. Dit betekent dat een ecologische risicobeoordeling niet vereist is.

Risicobeoordeling verspreiding - standaard

Onderdeel	Uitkomst
Liggen er kwetsbare objecten binnen het bodemvolume dat wordt ingesloten door het interventiewaarden-contour en/of zal dit binnen enkele jaren het geval zijn?	Nee
Is er een drijflaag aanwezig die door activiteiten en processen in de bodem kan worden verplaatst en van waaruit verspreiding van verontreiniging kan plaatsvinden?	Nee
Is er een zaklaag aanwezig die door activiteiten en processen in de bodem kan worden verplaatst en van waaruit verspreiding van verontreiniging kan plaatsvinden?	Ja
Is er sprake van een bodemvolume groter dan 6.000 m3 dat wordt ingesloten door het interventiewaarden-contour in het grondwater?	Ja

Toelichting:

Risicobeoordeling verspreiding - uitgebreid

Onderdeel	Uitkomst
Is aannemelijk gemaakt dat zich binnen de gebruikszone van de bodem geen zaklaag bevindt, of dat de diepte van de gebruikszone die gekozen is niet van toepassing is op het geval?	Ja
Is aannemelijk gemaakt dat het volume van de zaklaag zo gering is dat een verdere verspreiding naar een watervoerende laag verwaarloosbaar is en daarmee de kans op verspreiding van verontreiniging niet langer bestaat?	Nee
Er is sprake van een bodemvolume groter dan 6.000 m3 waarin één of meer stoffen in grondwater de interventiewaarde overschrijden. Is desondanks met metingen en/of berekeningen aangetoond dat jaarlijks niet meer dan 1.000 m3 nieuw bodemvolume verontreinigd raakt met grondwater waarin één of meer stoffen de interventiewaarde overschrijden?	Niet uitgevoerd

Toelichting:

Rapportage Sanscrit.nl
Instrument ter bepaling van spoedeisendheid van saneren

V. Sanscrit **2.7.2**
V. rapport **2.18**

Algemeen

Naam dossier: Ringdijk 390 VOCL 1015
Code:
Beoordelaar: [redacted]
Datum rapport:
Type bodemgebruik: huidig

Uitgevoerde beoordelingen:

Stap1: Ernst van de verontreiniging:
Er is sprake van een geval van ernstige verontreiniging als gevolg van:
- **Ernstige bodemverontreiniging**

	Stap2: Standaardbeoordeling	**Stap 3:** Uitgebreide beoordeling
Humaan	✔	✔
Ecologisch	✔	–
Verspreiding	✔	–

✔ = voltooid ✘ = niet uitgevoerd – = niet relevant op basis van uitkomst stap 2

Opmerkingen bij dossier:

Over Sanscrit

Sanscrit 2.0 is een geautomatiseerde versie van het Saneringscriterium. Het Saneringscriterium is beschreven in de Circulaire Bodemsanering 2013. De applicatie Sanscrit is ontwikkeld in opdracht van het ministerie van I&W.
Met het Saneringscriterium wordt bepaald of sprake is van onaanvaardbare risico's van bodemverontreiniging voor mens , ecosysteem of van het risico op verspreiding van de verontreiniging in het grondwater. Op basis van de bepaalde risico's wordt vastgesteld of een sanering met spoed dient te worden uitgevoerd.

Uitgangspunten
De sanering dient met spoed te worden uitgevoerd, tenzij op basis van de risicobeoordeling is aangetoond dat de sanering niet met spoed hoeft te worden uitgevoerd.
De werkwijze van het Saneringscriterium geldt voor:
- een geval van ernstige bodemverontreiniging;
- een historische verontreiniging. Voor verontreinigingen die sinds 1987 zijn ontstaan is artikel 13 van de Wbb (zorgplicht) van toepassing;
- huidig en voorgenomen gebruik;
- grond en grondwater. Voor waterbodem is een separate systematiek ontwikkeld, met uitzondering van asbest;
- alle stoffen waarvoor een interventiewaarde is afgeleid, met uitzondering van asbest. Daar asbest heel specifieke chemische en fysische eigenschappen heeft, is voor asbest separaat het 'Milieuhygiënisch saneringscriterium, protocol asbest' ontwikkeld hetgeen ook van toepassing is voor waterbodems . Asbest is dan ook niet opgenomen in het Sanscrit.

(Circulaire Bodemsanering, 2013)

Eindconclusie

Er is een geval van ernstige verontreiniging, maar de locatie hoeft niet met spoed gesaneerd te worden.

Humane risicobeoordeling - Toetsresultaten

Per stof

Stof	Dosis [mg/kg lg/d]	MTR [mg/kg lg/d]	Risico-Index
Ander groen, bebouwing, infrastructuur en industrie			
Tetrachlooretheen	0	1,60e-2	0,00

Combinatietoxicologie

Stofgroep	Risico-index
Ander groen, bebouwing, infrastructuur en industrie	
VOCLs	0,00

Hinder - toetsing aan geurdrempels

Stof	Concentratie binnenlucht [ug/m3]	Geurdrempel [ug/m3]
Ander groen, bebouwing, infrastructuur en industrie		
Tetrachlooretheen	4,56e-1	1,00e5

Hinder - huidcontact

Functie	Sprake van huidcontact?
Ander groen, bebouwing, infrastructuur en industrie	Nee

Toelichting:

Toetsing TCL's

Stof	Concentratie binnenlucht [ug/m3]	TCL [ug/m3]
Ander groen, bebouwing, infrastructuur en industrie		
Tetrachlooretheen	4,56e-1	2,50e2

Uitgebreid overzicht blootstelling

Blootstellingsroute	Relatieve bijdrage [%]
Ander groen, bebouwing, infrastructuur en industrie	
Tetrachlooretheen	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	0.00
Dermale opname buiten	0.00
Dermale opname tijdens baden	0.00
Ingestie grond	0.00
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00

Humane risico's - invoergegevens

Stof	C-totaal [mg/kg] Geheel	Bebouwd	Onbebouwd	C-grondwater [ug/l] Bebouwd	Onbebouwd
Ander groen, bebouwing, infrastructuur en industrie					
Tetrachlooretheen				1,00e0.	7,30e1

Parameters

Functie	Berekening blootstelling lood:	OS [%]	Diepte verontreiniging [m] t.o.v. kruipruimte	t.o.v. maaiveld
Ander groen, bebouwing, infrastructuur en industr	Als kind	10,00	0,75	1,25

Humane risicobeoordeling - Parameters uitgebreide beoordeling

Let op: in dit onderdeel wordt een overzicht gegeven van parameters die afwijken van de standaardwaarden uit de stap 2 beoordeling. Parameters die niet zijn ingevoerd en/of afwijken van de standaardinstellingen verschijnen ook niet in dit overzicht.

Blootstellingsroutes

Blootstellingsroute	Status
Ander groen, bebouwing, infrastructuur en industrie	
Verantwoording: op basis van gebruik en voorkomen	
Dermaal contact bij douchen	Uitgeschakeld
Dermaal contact grond	Uitgeschakeld
Ingestie drinkwater	Uitgeschakeld
Ingestie grond	Uitgeschakeld
Inhalatie binnenlucht	Uitgeschakeld
Inhalatie buitenlucht	Uitgeschakeld
Inhalatie dampen bij douchen	Uitgeschakeld
Inhalatie grond	Uitgeschakeld

Ecologische risicobeoordeling - standaard

De verontreiniging bevindt zich NIET geheel of ten dele in de bovenste meter van de onbedekte bodem . Er is GEEN sprake van gewassen wortelend in verontreinigde bodem dieper dan één meter. Dit betekent dat een ecologische risicobeoordeling niet vereist is.

Risicobeoordeling verspreiding - standaard

Onderdeel	Uitkomst
Liggen er kwetsbare objecten binnen het bodemvolume dat wordt ingesloten door het interventiewaarden-contour en/of zal dit binnen enkele jaren het geval zijn?	Nee
Is er een drijflaag aanwezig die door activiteiten en processen in de bodem kan worden verplaatst en van waaruit verspreiding van verontreiniging kan plaatsvinden?	Nee
Is er een zaklaag aanwezig die door activiteiten en processen in de bodem kan worden verplaatst en van waaruit verspreiding van verontreiniging kan plaatsvinden?	Nee
Is er sprake van een bodemvolume groter dan 6.000 m3 dat wordt ingesloten door het interventiewaarden-contour in het grondwater?	Nee

Toelichting:

Rapportage Sanscrit.nl

Instrument ter bepaling van spoedeisendheid van saneren

V. Sanscrit **2.7.2**
V. rapport **2.18**

Algemeen

Naam dossier: Ringdijk 390 minerale olie 'bfoto3/504'
Code:
Beoordelaar: [redacted]anteagroup.com
Datum rapport: dinsdag 26 januari 2021
Type bodemgebruik: huidig

Uitgevoerde beoordelingen:

Stap1: Ernst van de verontreiniging:
Er is sprake van een geval van ernstige verontreiniging als gevolg van:
- **Ernstige bodemverontreiniging**

	Stap2: Standaardbeoordeling	**Stap 3:** Uitgebreide beoordeling
Humaan	✔	✔
Ecologisch	✔	✘
Verspreiding	✔	▬

✔ = voltooid ✘ = niet uitgevoerd ▬ = niet relevant op basis van uitkomst stap 2

Opmerkingen bij dossier:

Over Sanscrit

Sanscrit 2.0 is een geautomatiseerde versie van het Saneringscriterium. Het Saneringscriterium is beschreven in de Circulaire Bodemsanering 2013. De applicatie Sanscrit is ontwikkeld in opdracht van het ministerie van I&W.
Met het Saneringscriterium wordt bepaald of sprake is van onaanvaardbare risico's van bodemverontreiniging voor mens , ecosysteem of van het risico op verspreiding van de verontreiniging in het grondwater. Op basis van de bepaalde risico's wordt vastgesteld of een sanering met spoed dient te worden uitgevoerd.

Uitgangspunten
De sanering dient met spoed te worden uitgevoerd, tenzij op basis van de risicobeoordeling is aangetoond dat de sanering niet met spoed hoeft te worden uitgevoerd.
De werkwijze van het Saneringscriterium geldt voor:
- een geval van ernstige bodemverontreiniging;
- een historische verontreiniging. Voor verontreinigingen die sinds 1987 zijn ontstaan is artikel 13 van de Wbb (zorgplicht) van toepassing;
- huidig en voorgenomen gebruik;
- grond en grondwater. Voor waterbodem is een separate systematiek ontwikkeld, met uitzondering van asbest;
- alle stoffen waarvoor een interventiewaarde is afgeleid, met uitzondering van asbest. Daar asbest heel specifieke chemische en fysische eigenschappen heeft, is voor asbest separaat het 'Milieuhygiënisch saneringscriterium, protocol asbest' ontwikkeld hetgeen ook van toepassing is voor waterbodems . Asbest is dan ook niet opgenomen in het Sanscrit.

(Circulaire Bodemsanering, 2013)

Eindconclusie

Er is een geval van ernstige verontreiniging, maar de locatie hoeft niet met spoed gesaneerd te worden.

Humane risicobeoordeling - Toetsresultaten

Per stof

Stof	Dosis [mg/kg lg/d]	MTR [mg/kg lg/d]	Risico-Index
Ander groen, bebouwing, infrastructuur en industrie			
TPH alifaten >EC16-EC21	1,02e-3	2,00	0,00

Combinatietoxicologie

Stofgroep	Risico-index
Ander groen, bebouwing, infrastructuur en industrie	
Minerale olie /gasolie/TPH	0,00

Hinder - huidcontact

Functie	Sprake van huidcontact?
Ander groen, bebouwing, infrastructuur en industrie	Nee

Toelichting:

Uitgebreid overzicht blootstelling

Blootstellingsroute	Relatieve bijdrage [%]
Ander groen, bebouwing, infrastructuur en industrie	
TPH alifaten >EC16-EC21	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	4.50
Dermale opname buiten	95.50
Dermale opname tijdens baden	0.00
Ingestie grond	0.00
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00

Humane risico's - invoergegevens

Stof	C-totaal [mg/kg] Geheel	Bebouwd	Onbebouwd	C-grondwater [ug/l] Bebouwd	Onbebouwd
Ander groen, bebouwing, infrastructuur en industrie					
TPH alifaten >EC16-EC21	1,30e4				

Parameters

Functie	Berekening blootstelling lood:	OS [%]	Diepte verontreiniging [m] t.o.v. kruipruimte	t.o.v. maaiveld
Ander groen, bebouwing, infrastructuur en industr	Als kind	1,50	0,60	0,60

Humane risicobeoordeling - Parameters uitgebreide beoordeling

Let op: in dit onderdeel wordt een overzicht gegeven van parameters die afwijken van de standaardwaarden uit de stap 2 beoordeling. Parameters die niet zijn ingevoerd en/of afwijken van de standaardinstellingen verschijnen ook niet in dit overzicht.

Blootstellingsroutes

Blootstellingsroute	Status
Ander groen, bebouwing, infrastructuur en industrie	
Verantwoording: op basis van gebruik en voorkomen	
Dermaal contact bij douchen	Uitgeschakeld
Ingestie drinkwater	Uitgeschakeld
Ingestie grond	Uitgeschakeld
Inhalatie binnenlucht	Uitgeschakeld
Inhalatie buitenlucht	Uitgeschakeld
Inhalatie dampen bij douchen	Uitgeschakeld
Inhalatie grond	Uitgeschakeld

Ecologische risicobeoordeling - standaard

De verontreiniging bevindt zich geheel of ten dele in de bovenste meter van de onbedekte bodem en/of er is sprake van gewassen wortelend in verontreinigde bodem dieper dan één meter.

Ecologisch toetsniveau: **Relatief ongevoelig**

Contour	Ingevoerd [m2]	Criterium [m2]	Overschrijding
TD>25%	30	50000	Nee
TD>65%	30	5000	Nee

Risicobeoordeling verspreiding - standaard

Onderdeel	Uitkomst
Liggen er kwetsbare objecten binnen het bodemvolume dat wordt ingesloten door het interventiewaarden-contour en/of zal dit binnen enkele jaren het geval zijn?	Nee
Is er een drijflaag aanwezig die door activiteiten en processen in de bodem kan worden verplaatst en van waaruit verspreiding van verontreiniging kan plaatsvinden?	Nee
Is er een zaklaag aanwezig die door activiteiten en processen in de bodem kan worden verplaatst en van waaruit verspreiding van verontreiniging kan plaatsvinden?	Nee
Is er sprake van een bodemvolume groter dan 6.000 m3 dat wordt ingesloten door het interventiewaarden-contour in het grondwater?	Nee

Toelichting:

Rapportage Sanscrit.nl

Instrument ter bepaling van spoedeisendheid van saneren

V. Sanscrit **2.7.2**
V. rapport **2.18**

Algemeen

Naam dossier: Ringdijk 390 metalen, pcb en asbest
Code:
Beoordelaar: [redacted]anteagroup.com
Datum rapport: dinsdag 26 januari 2021
Type bodemgebruik: huidig

Uitgevoerde beoordelingen:

Stap1: Ernst van de verontreiniging:
Er is sprake van een geval van ernstige verontreiniging als gevolg van:
- **Ernstige bodemverontreiniging**

	Stap2: Standaardbeoordeling	**Stap 3:** Uitgebreide beoordeling
Humaan	✔	✔
Ecologisch	✔	✘
Verspreiding	✔	▬

✔ = voltooid ✘ = niet uitgevoerd ▬ = niet relevant op basis van uitkomst stap 2

Opmerkingen bij dossier:

Over Sanscrit

Sanscrit 2.0 is een geautomatiseerde versie van het Saneringscriterium. Het Saneringscriterium is beschreven in de Circulaire Bodemsanering 2013. De applicatie Sanscrit is ontwikkeld in opdracht van het ministerie van I&W.
Met het Saneringscriterium wordt bepaald of sprake is van onaanvaardbare risico's van bodemverontreiniging voor mens , ecosysteem of van het risico op verspreiding van de verontreiniging in het grondwater. Op basis van de bepaalde risico's wordt vastgesteld of een sanering met spoed dient te worden uitgevoerd.

Uitgangspunten
De sanering dient met spoed te worden uitgevoerd, tenzij op basis van de risicobeoordeling is aangetoond dat de sanering niet met spoed hoeft te worden uitgevoerd.
De werkwijze van het Saneringscriterium geldt voor:
- een geval van ernstige bodemverontreiniging;
- een historische verontreiniging. Voor verontreinigingen die sinds 1987 zijn ontstaan is artikel 13 van de Wbb (zorgplicht) van toepassing;
- huidig en voorgenomen gebruik;
- grond en grondwater. Voor waterbodem is een separate systematiek ontwikkeld , met uitzondering van asbest;
- alle stoffen waarvoor een interventiewaarde is afgeleid , met uitzondering van asbest. Daar asbest heel specifieke chemische en fysische eigenschappen heeft, is voor asbest separaat het 'Milieuhygiënisch saneringscriterium, protocol asbest' ontwikkeld hetgeen ook van toepassing is voor waterbodems . Asbest is dan ook niet opgenomen in het Sanscrit.

(Circulaire Bodemsanering, 2013)

Eindconclusie

Er is een geval van ernstige verontreiniging, maar de locatie hoeft niet met spoed gesaneerd te worden.

Humane risicobeoordeling - Toetsresultaten

Per stof

Stof	Dosis [mg/kg lg/d]	MTR [mg/kg lg/d]	Risico-Index
Ander groen, bebouwing, infrastructuur en industrie			
PCB180	8,40e-8	1,00e-5	0,01
Koper	1,93e-4	1,40e-1	0,00
Nikkel	1,42e-5	5,00e-2	0,00
PCB153	9,69e-8	1,00e-5	0,01
PCB101	2,10e-8	1,00e-5	0,00
PCB52	1,39e-9	1,00e-5	0,00
PCB118	7,75e-9	1,00e-5	0,00
PCB138	6,79e-8	1,00e-5	0,01

Combinatietoxicologie

Stofgroep	Risico-index
Ander groen, bebouwing, infrastructuur en industrie	
Indicator PCBs	0,03

Hinder - huidcontact

Functie	Sprake van huidcontact?
Ander groen, bebouwing, infrastructuur en industrie	Nee

Toelichting:

Toetsing TCL's

Stof	Concentratie binnenlucht [ug/m3]	TCL [ug/m3]
Ander groen, bebouwing, infrastructuur en industrie		
Koper	0	1,00e0.
Nikkel	0	5,00e-2
PCB153	1,66e-2	5,00e-1
PCB101	7,83e-2	5,00e-1
PCB52	1,02e-2	5,00e-1
PCB118	2,82e-4	5,00e-1
PCB138	1,62e-3	5,00e-1
PCB180	1,21e-2	5,00e-1

Uitgebreid overzicht blootstelling

Blootstellingsroute	Relatieve bijdrage [%]
Ander groen, bebouwing, infrastructuur en industrie	
Koper	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	0.00
Dermale opname buiten	0.00
Dermale opname tijdens baden	0.00
Ingestie grond	100.00
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00
Nikkel	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	0.00
Dermale opname buiten	0.00
Dermale opname tijdens baden	0.00
Ingestie grond	100.00
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00
PCB101	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	1.09
Dermale opname buiten	23.12
Dermale opname tijdens baden	0.00
Ingestie grond	75.79
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00
PCB118	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	1.09
Dermale opname buiten	23.12
Dermale opname tijdens baden	0.00
Ingestie grond	75.79
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00
PCB138	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	1.09
Dermale opname buiten	23.12
Dermale opname tijdens baden	0.00
Ingestie grond	75.79
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00

Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00
PCB153	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	1.09
Dermale opname buiten	23.12
Dermale opname tijdens baden	0.00
Ingestie grond	75.79
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00
PCB180	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	1.09
Dermale opname buiten	23.12
Dermale opname tijdens baden	0.00
Ingestie grond	75.79
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00
PCB52	
Consumptie van gewassen uit eigen tuin	0.00
Dermale opname binnen	1.09
Dermale opname buiten	23.12
Dermale opname tijdens baden	0.00
Ingestie grond	75.79
Inhalatie dampen tijdens douchen	0.00
Inhalatie van binnenlucht	0.00
Inhalatie van buitenlucht	0.00
Inhalatie van gronddeeltjes	0.00
Permeatie drinkwater	0.00

Humane risico's - invoergegevens

	C-totaal [mg/kg]			C-grondwater [ug/l]	
Stof	**Geheel**	**Bebouwd**	**Onbebouwd**	**Bebouwd**	**Onbebouwd**
Ander groen, bebouwing, infrastructuur en industrie					
Koper	7,90e2				
Nikkel	5,80e1				
PCB153	3,00e-1				
PCB101	6,50e-2				
PCB52	4,30e-3				
PCB118	2,40e-2				
PCB138	2,10e-1				
PCB180	2,60e-1				

Parameters

	Berekening		Diepte verontreiniging [m]	
Functie	**blootstelling lood:**	**OS [%]**	**t.o.v. kruipruimte**	**t.o.v. maaiveld**
Ander groen, bebouwing, infrastructuur en industr	Als kind	1,50	0,01	0,01

Humane risicobeoordeling - Parameters uitgebreide beoordeling

Let op: in dit onderdeel wordt een overzicht gegeven van parameters die afwijken van de standaardwaarden uit de stap 2 beoordeling. Parameters die niet zijn ingevoerd en/of afwijken van de standaardinstellingen verschijnen ook niet in dit overzicht.

Blootstellingsroutes

Blootstellingsroute	Status
Ander groen, bebouwing, infrastructuur en industrie	
Verantwoording: op basis van gebruik	
Dermaal contact bij douchen	Uitgeschakeld
Ingestie drinkwater	Uitgeschakeld
Inhalatie binnenlucht	Uitgeschakeld
Inhalatie buitenlucht	Uitgeschakeld
Inhalatie dampen bij douchen	Uitgeschakeld
Inhalatie grond	Uitgeschakeld

Ecologische risicobeoordeling - standaard

De verontreiniging bevindt zich geheel of ten dele in de bovenste meter van de onbedekte bodem en/of er is sprake van gewassen wortelend in verontreinigde bodem dieper dan één meter.

Ecologisch toetsniveau: **Relatief ongevoelig**

Contour	Ingevoerd [m2]	Criterium [m2]	Overschrijding
TD>25%	5000	50000	Nee
TD>65%	2000	5000	Nee

Risicobeoordeling verspreiding - standaard

Onderdeel	Uitkomst
Liggen er kwetsbare objecten binnen het bodemvolume dat wordt ingesloten door het interventiewaarden-contour en/of zal dit binnen enkele jaren het geval zijn?	Nee
Is er een drijflaag aanwezig die door activiteiten en processen in de bodem kan worden verplaatst en van waaruit verspreiding van verontreiniging kan plaatsvinden?	Nee
Is er een zaklaag aanwezig die door activiteiten en processen in de bodem kan worden verplaatst en van waaruit verspreiding van verontreiniging kan plaatsvinden?	Nee
Is er sprake van een bodemvolume groter dan 6.000 m3 dat wordt ingesloten door het interventiewaarden-contour in het grondwater?	Nee

Toelichting:

Appendix 4

Assessment safety classes

Review of CROW publication 400

Preface

The tables below show the provisional safety classes according to CROW publication 400 for the tested substances. The safety classes are shown at project level and at sample level. The results at project level are a summary per type of sample: soil, asbestos and groundwater. The principles of the assessment are listed below.

Assumptions

Groundwater considered: no
Degree of ventilation: insufficient

Results

Provisional safety class at project level

Location	Sample type	Safety class with decisive substance (s)			
		Volatile substances		Non-Volatile substances	
Digging location (*)	ground	black	Mineral oil C10 - C40	basic hygiene	-
Digging location (*)	groundwater	black	cis-1,2-dichloroethylene, chloroethylene, tetrachlorethylene, trans-1,2-dichloroethylene, 1,1-dichloroethane, trichlorethylene, Mineral oil C10 - C40	n/a	-

Provisional safety class sample level

Sample	Sample type	Safety class with decisive substance (s)			
		Volatile substances		Non-Volatile substances	
1016_N-16 (*)	ground	basic hygiene	-	n/a	-
1016_N-4 (*)	ground	orange	Minerale olie C10 - C40	n/a	-
1017-19 (*)	ground	basic hygiene	-	n/a	-
1018-3 (*)	ground	basic hygiene	-	n/a	-
105b-2 (*)	ground	basic hygiene	-	basic hygiene	-
105b-3 (*)	ground	basic hygiene	-	basic hygiene	-
107b-2 (*)	ground	basic hygiene	-	basic hygiene	-
107b-3 (*)	ground	basic hygiene	-	basic hygiene	-
108b-2 (*)	ground	basic hygiene	-	basic hygiene	-
108b-3 (*)	ground	basic hygiene	-	basic hygiene	-

Sample	Sample type	Safety class with decisive substance (s)			
		Volatile substances		Non-Volatile substances	
109b-2 (*)	ground	basic hygiene	-	basic hygiene	-
109b-3 (*)	ground	basic hygiene	-	basic hygiene	-
500-2 (*)	ground	basic hygiene	-	n/a	-
501-2 (*)	ground	basic hygiene	-	n/a	-
502-2 (*)	ground	basic hygiene	-	n/a	-
503-2 (*)	ground	basic hygiene	-	n/a	-
504-6 (*)	ground	black	Minerale olie C10 - C40	n/a	-
505-3 (*)	ground	black	Minerale olie C10 - C40	n/a	-
505-4 (*)	ground	basic hygiene	-	n/a	-
506-3 (*)	ground	basic hygiene	-	n/a	-
507-3 (*)	ground	basic hygiene	-	n/a	-
508-3 (*)	ground	basic hygiene	-	n/a	-
509-3 (*)	ground	black	Minerale olie C10 - C40	n/a	-
509-5 (*)	ground	basic hygiene	-	n/a	-
510-4 (*)	ground	basic hygiene	-	n/a	-
511-4 (*)	ground	basic hygiene	-	n/a	-
513-3 (*)	ground	basic hygiene	-	n/a	-
515-4 (*)	ground	basic hygiene	-	n/a	-
515-6 (*)	ground	basic hygiene	-	n/a	-
516-1 (*)	ground	basic hygiene	-	basic hygiene	-
518-1 (*)	ground	basic hygiene	-	basic hygiene	-
519-1 (*)	ground	n/a	-	basic hygiene	-
520-2 (*)	ground	n/a	-	basic hygiene	-
521-1 (*)	ground	n/a	-	basic hygiene	-
522-1 (*)	ground	n/a	-	basic hygiene	-
523-1 (*)	ground	n/a	-	basic hygiene	-
525-2 (*)	ground	basic hygiene	-	basic hygiene	-
525a-3 (*)	ground	n/a	-	basic hygiene	-
526-2 (*)	ground	n/a	-	basic hygiene	-
527-1 (*)	ground	n/a	-	basic hygiene	-
528-1 (*)	ground	n/a	-	basic hygiene	-
528a-2 (*)	ground	n/a	-	basic hygiene	-
528a-3 (*)	ground	n/a	-	basic hygiene	-
528a-4 (*)	ground	n/a	-	basic hygiene	-
529-1 (*)	ground	n/a	-	basic hygiene	-

Sample	Sample type	Safety class with decisive substance (s)			
		Volatile substances		Non-Volatile substances	
530a-3 (*)	ground	n/a	-	basic hygiene	-
531-1 (*)	ground	n/a	-	basic hygiene	-
532-1 (*)	ground	n/a	-	basic hygiene	-
533-1 (*)	ground	n/a	-	basic hygiene	-
534-1 (*)	ground	n/a	-	basic hygiene	-
535-1 (*)	ground	basic hygiene	-	basic hygiene	-
535-2 (*)	ground	n/a	-	basic hygiene	-
541-1 (*)	ground	n/a	-	basic hygiene	-
542-1 (*)	ground	n/a	-	basic hygiene	-
543-2 (*)	ground	n/a	-	basic hygiene	-
544-1 (*)	ground	n/a	-	basic hygiene	-
545 (*)	ground	n/a	-	basic hygiene	-
547-1 (*)	ground	n/a	-	basic hygiene	-
548-2 (*)	ground	n/a	-	basic hygiene	-
549 (*)	ground	n/a	-	basic hygiene	-
550-1 (*)	ground	n/a	-	basic hygiene	-
551-1 (*)	ground	orange	Minerale olie C10 - C40	basic hygiene	-
A108-1 (*)	ground	basic hygiene	-	basic hygiene	-
A111-1 (*)	ground	basic hygiene	-	basic hygiene	-
A114-1 (*)	ground	basic hygiene	-	basic hygiene	-
A118-1 (*)	ground	basic hygiene	-	basic hygiene	-
AMM01 (*)	ground	n/a	-	basic hygiene	-
Grit 1-1 (*)	ground	black	Minerale olie C10 - C40	n/a	-
Grit 2-1 (*)	ground	black	Minerale olie C10 - C40	n/a	-
MM01 (*)	ground	basic hygiene	-	basic hygiene	-
MM02 (*)	ground	basic hygiene	-	basic hygiene	-
MM03 (*)	ground	n/a	-	basic hygiene	-
MM04 (*)	ground	basic hygiene	-	basic hygiene	-
MM05 (*)	ground	basic hygiene	-	basic hygiene	-
V1-1 (*)	ground	n/a	-	n/a	-
V10-1 (*)	ground	n/a	-	n/a	-
V11-1 (*)	ground	n/a	-	n/a	-
V12-1 (*)	ground	n/a	-	n/a	-
V13-1 (*)	ground	n/a	-	n/a	-
V14-1 (*)	ground	n/a	-	n/a	-

Sample	Sample type	Safety class with decisive substance (s)			
		Volatile substances		Non-Volatile substances	
V15-1 (*)	ground	n/a	-	n/a	-
V16-1 (*)	ground	n/a	-	n/a	-
V17-1 (*)	ground	n/a	-	n/a	-
V18-1 (*)	ground	n/a	-	n/a	-
V19-1 (*)	ground	n/a	-	n/a	-
V2-1 (*)	ground	n/a	-	n/a	-
V20-1 (*)	ground	n/a	-	n/a	-
V3-1 (*)	ground	n/a	-	n/a	-
V4a-1 (*)	ground	n/a	-	n/a	-
V5a-1 (*)	ground	n/a	-	n/a	-
V6a-1 (*)	ground	n/a	-	n/a	-
V7-1 (*)	ground	n/a	-	n/a	-
V8-1 (*)	ground	n/a	-	n/a	-
V9-1 (*)	ground	n/a	-	n/a	-
a101-1 (*)	ground	basic hygiene	-	basic hygiene	-
1002-3-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1002-1-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1003-3-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1003-2-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1003-1-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1004-3-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1004-2-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1004-1-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1005-3-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1005-2-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1005-1-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1006-3-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1006-2-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1006-1-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1007-1-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1007-2-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1007-3-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1008-1-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1008-2-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1008-3-1-1 (*)	groundwater	basic hygiene	-	n/a	-

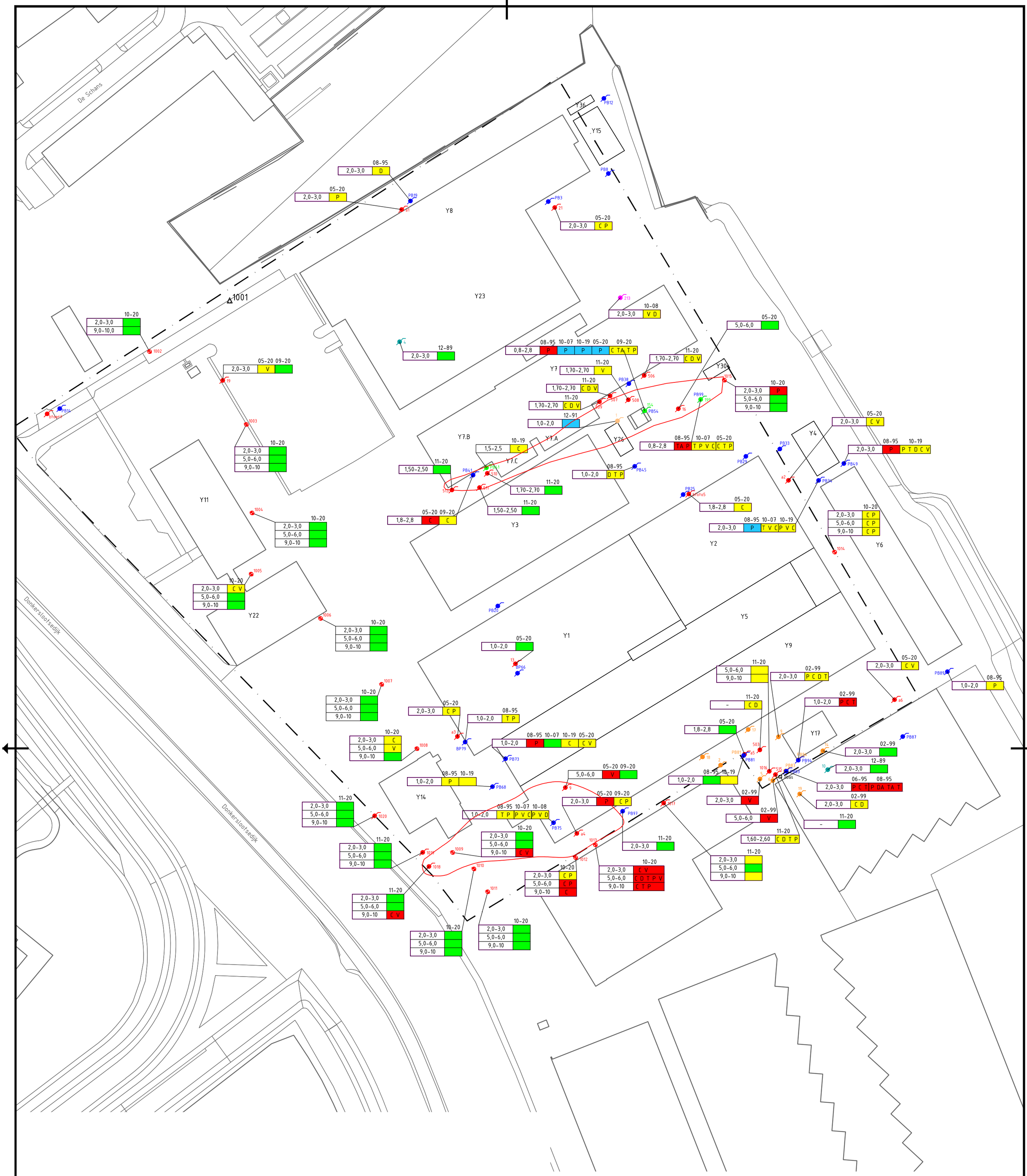
Sample	Sample type	Safety class with decisive substance (s)			
		Volatile substances		Non-Volatile substances	
1009-1-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1009-2-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1009-3-1-1 (*)	groundwater	black	cis-1,2-dichlooretheen, chlooretheen	n/a	-
1010-1-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1010-2-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1010-3-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1011-1-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1011-2-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1011-3-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1012-1-1-1 (*)	groundwater	black	cis-1,2-dichlooretheen, tetrachlooretheen	n/a	-
1012-1-1-2 (*)	groundwater	basic hygiene	-	n/a	-
1012-3-1-1 (*)	groundwater	black	cis-1,2-dichlooretheen	n/a	-
1013-1-1-1 (*)	groundwater	black	cis-1,2-dichlooretheen, chlooretheen	n/a	-
1013-2-1-1 (*)	groundwater	black	cis-1,2-dichlooretheen, trans-1,2-dichlooretheen, 1,1-dichloorethaan, trichlooretheen, tetrachlooretheen	n/a	-
1013-3-1-1 (*)	groundwater	black	cis-1,2-dichlooretheen, trans-1,2-dichlooretheen, trichlooretheen, tetrachlooretheen	n/a	-
1014-1-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1014-2-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1014-3-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1015-1-1-1 (*)	groundwater	black	tetrachlooretheen	n/a	-
1015-2-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1015-3-1-1 (*)	groundwater	basic hygiene	-	n/a	-
41-1-3 (*)	groundwater	basic hygiene	-	n/a	-
501-1-1 (*)	groundwater	black	Minerale olie C10 - C40	n/a	-
Obas-1-1 (*)	groundwater	basic hygiene	-	n/a	-
502-1-1 (*)	groundwater	basic hygiene	-	n/a	-

Sample	Sample type	Safety class with decisive substance (s)			
		Volatile substances		Non-Volatile substances	
503-1-1 (*)	groundwater	basic hygiene	-	n/a	-
97-1-1 (*)	groundwater	basic hygiene	-	n/a	-
504-1-1 (*)	groundwater	basic hygiene	-	n/a	-
506-1-1 (*)	groundwater	basic hygiene	-	n/a	-
508-1-1 (*)	groundwater	basic hygiene	-	n/a	-
507-1-1 (*)	groundwater	basic hygiene	-	n/a	-
509-1-1 (*)	groundwater	basic hygiene	-	n/a	-
510-1-1 (*)	groundwater	basic hygiene	-	n/a	-
511-1-1 (*)	groundwater	basic hygiene	-	n/a	-
513-1-1 (*)	groundwater	basic hygiene	-	n/a	-
515-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1020(10m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1020(6m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1020(3m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1018(3m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1018(6m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1018(10m)-1-1 (*)	groundwater	black	cis-1,2-dichlooretheen	n/a	-
1019(10m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1019(6m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1019(3m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1017(3m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1017(10m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1017(6m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1016(10m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-
1016(6m)-1-1 (*)	groundwater	basic hygiene	-	n/a	-

Appendix 5

Cost estimate (separate annex)

Drawings



Verklaring

- Grens onderzoeksgebied
- Bodemonderzoek 1989 (Dienst Centraal Milieubeheer Rijnmond)
- Bodemonderzoek 1991
- Bodemonderzoek 1995 (Geotechnisch en milieukundig advies- en onderzoeksburo)
- Bodemonderzoek februari 1999 (Oranjewoud)
- Bodemonderzoek 2007 (Royal Haskoning)
- Bodemonderzoek 2008 (Royal Haskoning)
- Bodemonderzoek juni 2020 (Anteagroup)

	datum
filterdiepte	

- Clean
- Lightly contaminated
- Moderately contaminated
- Strongly contaminated

C	cis + trans-1,2-Dichlooretheen
V	Vinylchloride
D	1,1-Dichloorethaan
P	Tetrachlooretheen (Per)
T	Trichlooretheen
TA	Tetrachloormethaan
DA	Dichloormethaan

0 10 20 30 40m

C0	29-01-2021	CONCEPT	M.H.
NR	DATUM	WIJZIGING	GET.

Panattoni

Overview contamination VOCL groundwater

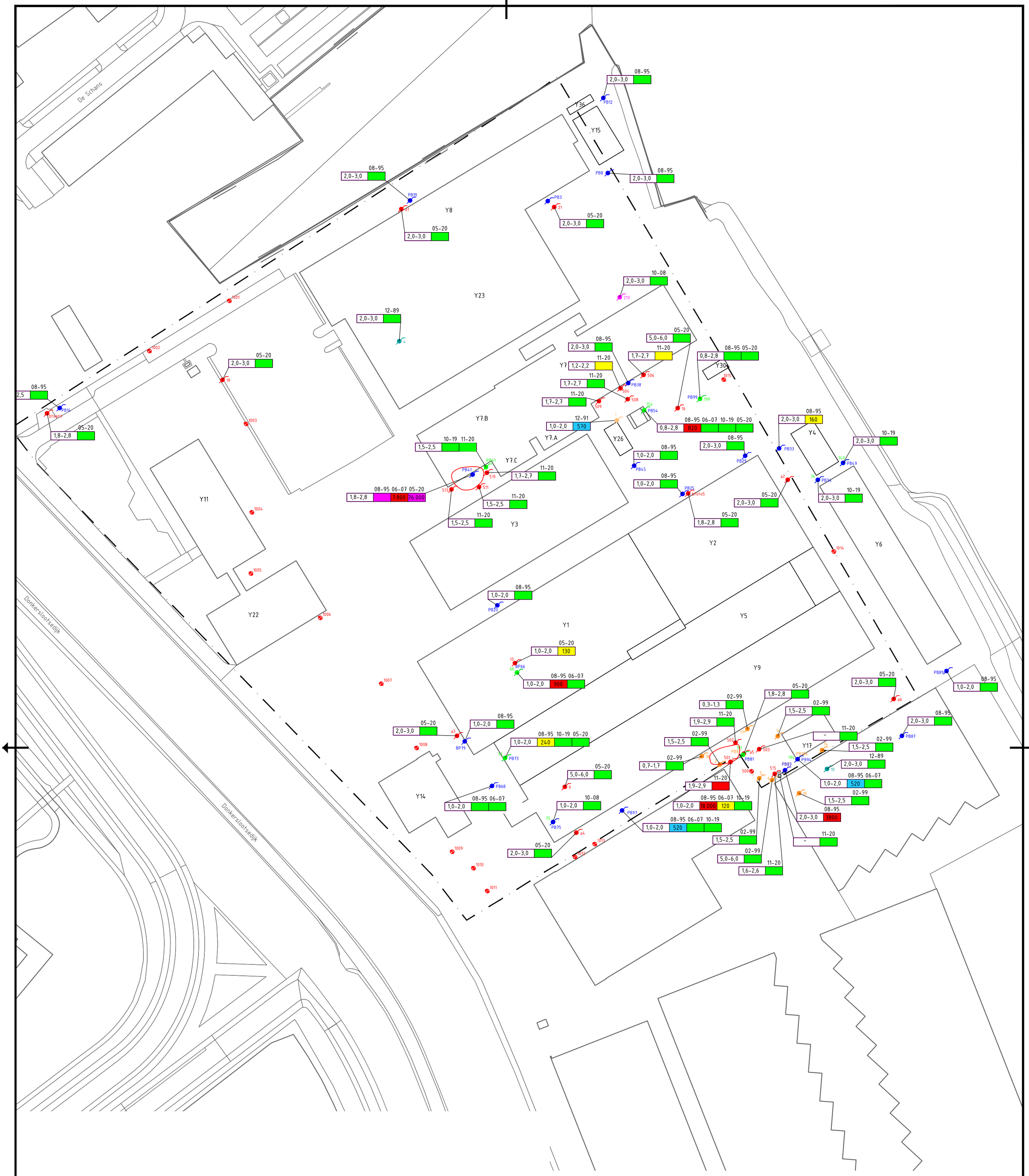
Tekeningnummer
0465250.100-VS2

Tekenaar M. Heetland
Projectleider A. Ooijevaar
Schaal 1:1000
Formaat A2
1 IN 1
Status INTERN
Wijz.nr. C0

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Verklaring

- Grens onderzoeksgebied
- Bodemonderzoek 1989 (Dienst Centraal Milieubeheer Rijnmond)
- Bodemonderzoek 1995 (Geotechnisch en milieukundig advies- en onderzoeksburo)
- Bodemonderzoek februari 1999 (Oranjewoud)
- Bodemonderzoek 2007 (Royal Haskoning)
- Bodemonderzoek 2008 (Royal Haskoning)
- Bodemonderzoek juni 2020 (Anteagroup)

	datum
filterdiepte	800

- Clean
- Lightly contaminated
- Moderately contaminated
- Strongly contaminated
- Floating layer
- 800 Concentration (ug/l)

0 10 20 30 40m

C0	29-01-2021	CONCEPT	M.H.
NR	DATUM	WIJZIGING	GET.

Panattoni

Overview contamination mineral oil groundwater

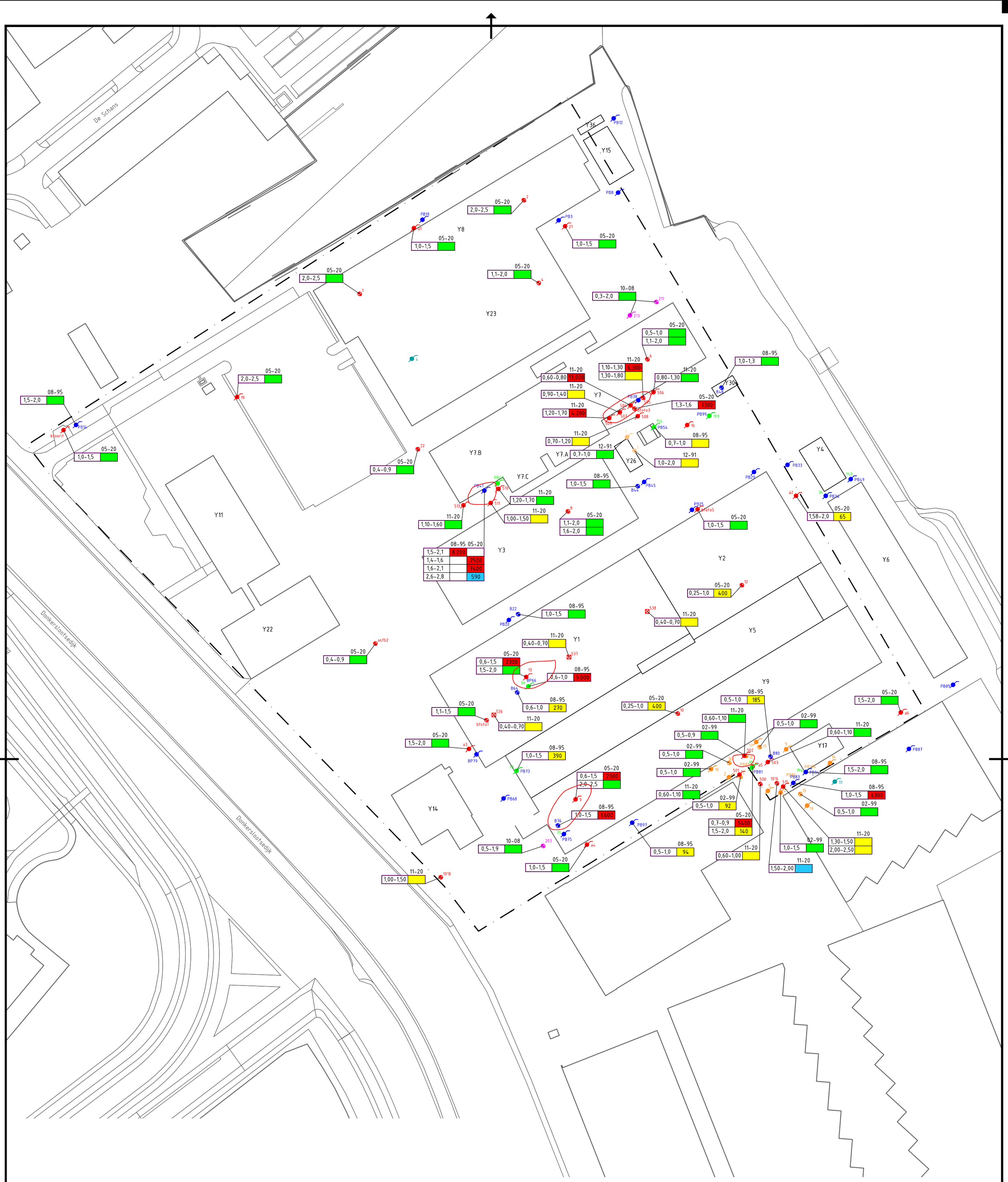
Tekeningnummer
0465250.100-VS3

Tekenaar: M. Heetland
Projectleider: A. Ooijevaar
Schaal: 1:1000
Formaat: A2
1 IN 1
Status: INTERN
Wijz.nr.: C0

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Verklaring

- Grens onderzoeksgebied
- Bodemonderzoek 1991
- Bodemonderzoek 1989 (Dienst Centraal Milieubeheer Rijnmond)
- Bodemonderzoek 1995 (Geotechnisch en milieukundig advies- en onderzoeksburo)
- Bodemonderzoek februari 1999 (Oranjewoud)
- Bodemonderzoek 2007 (Royal Haskoning)
- Bodemonderzoek 2008 (Royal Haskoning)
- Bodemonderzoek juni 2020 (Anteagroup)

	datum
filterdiepte	92

- Clean
- Lightly contaminated
- Moderately contaminated
- Strongly contaminated
- Floating layer
- 92 Concentration (mg/kg d.s.)

0 10 20 30 40m

C0	29-01-2021	CONCEPT	M.H.
NR	DATUM	WIJZIGING	GET.

Panattoni

Overview contaminations mineral oil subsoil

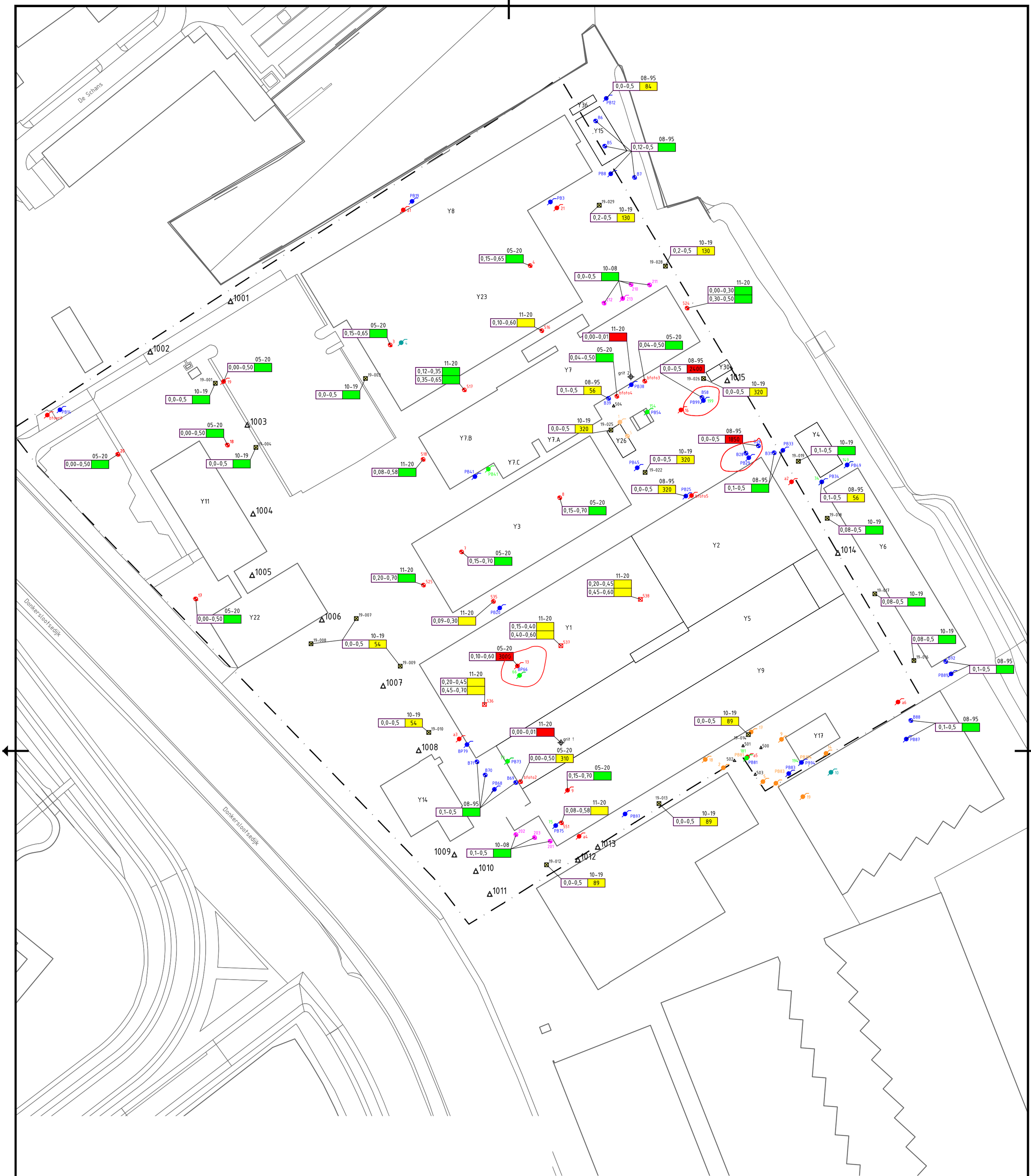
Tekeningnummer
0465250.100-VS4

Tekenaar M. Heetland
Projectleider A. Ooijevaar
Schaal 1:1000
Formaat A2
1 IN 1
Status INTERN
Wijz.nr. C0

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Verklaring

- Grens onderzoeksgebied
- Bodemonderzoek 1989 (Dienst Centraal Milieubeheer Rijnmond)
- Bodemonderzoek 1991
- Bodemonderzoek 1995 (Geotechnisch en milieukundig advies- en onderzoeksburo)
- Bodemonderzoek februari 1999 (Oranjewoud)
- Bodemonderzoek 2007 (Royal Haskoning)
- Bodemonderzoek 2008 (Royal Haskoning)
- Bodemonderzoek oktober 2019 (Royal Haskoning)
- Bodemonderzoek juni 2020 (Anteagroup)

	datum
filterdiepte	2400

- Clean
- Lightly contaminated
- Moderately contaminated
- Strongly contaminated
- Floating layer
- 2400 Concentration (mg/kg d.s.)

0 10 20 30 40m

C0	29-01-2021	CONCEPT	M.H.
NR	DATUM	WIJZIGING	GET.

Panattoni

Overview contamination mineral oil topsoil (immobile)

Tekeningnummer
0465250.100-VS5

Tekenaar: M. Heetland
Schaal: 1:1000
Projectleider: A. Ooijevaar
Formaat: A2
1 IN 1
Status: INTERN
Wijz.nr.: C0

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Verklaring

- Grens onderzoeksgebied
- Strongly contaminated
- Moderately contaminated
- Lightly contaminated
- Clean

NR	DATUM	WIJZIGING	GET.
C0	29-01-2021	CONCEPT	-

Panattoni

Overview contaminations metals, PCB, asbestos, immobile topsoil

Tekeningnummer
0460838.100-VS11

Tekenaar: M. Heetland
Schaal: 1:1000
Projectleider: A. Ooijevaar
Formaat: A2
1 IN 1
Status: INTERN
Wijz.nr.: C0

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About Antea Group

From city to countryside, from air to water: Antea Group's engineers and consultants have been contributing to our living environment in the Netherlands for years now. We design bridges and roadways, and create residential neighborhoods and water structures. But we are also involved in areas such as the environment, safety, asset management and energy. Under the name Oranjewoud, we expanded into an all-round, independent partner for companies and government bodies. As the Antea Group, we also apply this knowledge at a global level. By combining valuable knowledge, including on technical matters, with a pragmatic approach, we make solutions attainable and workable. Goal-oriented, with an eye for sustainability. In this way, we anticipate today's questions and tomorrow's answers. Just as we have been for over 60 years now.

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