Port Environmental Review System (PERS) Concept

Port of Moerdijk

2014

The Port Environmental Review System (PERS) was developed on behalf of ESPO and the ECOPORTS Foundation

havenschap MOERDIJK

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1. PREAMBLE

1.1. Introduction

The EcoPorts- Port Environmental Review System (PERS) is a European initiative for the environmental certification of sea ports that are affiliated with the European Sea Ports Organisation (ESPO). The PERS methodology is one of the instruments of the ESPO to demonstrate that the Port of Moerdijk meets various requirements relating to sustainable development and environmental protection.
In October 2012, the Moerdijk Port Authority was granted a recertification by the ESPO in the framework of the EcoPorts PERS Certificate. This PERS certificate is valid for a period of two years. At the end of this period, the sustainability and environmental protection of the Moerdijk Port and Industrial Estate is reviewed anew. This document was drawn up for the purpose of the recertification process that is part of the EcoPorts- Port Environmental Review System.

1.2. The Port of Moerdijk

The Moerdijk Port and Industrial Estate is located in the Dutch Municipality of Moerdijk and consists of an area with six harbour basins and an adjoining industrial estate. The Port of Moerdijk is the farthest inland sea port in the Netherlands, with a total area of 2345 hectares. The area has an open connection to the North Sea, in approximately 3.5 hours of sailing, via the waterways Hollandsch Diep, Dordtse Kil, Oude Maas and Nieuwe Waterweg. In addition, it lies at the crossroads of the major European inland waterways of the Rhine, Meuse and Schelde (Rijn, Maas en Schelde). The six Moerdijk harbour basins are all accessible to seagoing vessels with a draught of maximum 9 meters +/- NAP (Amsterdam Ordnance Datum). The following are the harbour basins:

1. The Hollandsch Diep harbour basin;
2. De Insteekhaven Roode Vaart (The Roode Vaart Dock);
3. De Centrale Insteekhaven (The Central Dock);
4. De noordelijke insteekhaven (The Northern Dock);
5. De Oostelijke Insteekhaven (The Eastern Dock);
6. De Westerlijke Insteekhaven (The Western Dock);

Due to its strategic location between the Ports of Rotterdam and Antwerp, Moerdijk fulfils an important supporting function for both international ports. Via an intricate network, the Port of Moerdijk is also connected to the Brabant harbour basins of Tilburg, Waalwijk and Oosterhout. On land, the Moerdijk Port and Industrial Estate has a direct connection to the A17 motorway and the European rail network. In addition, the National Pipeline Route runs through the Moerdijk Port and Industrial Estate. This connects the chemical and process industries of various European industrial estates for the purpose of the underground transport of raw materials and bulk.

The Moerdijk Port and Industrial Estate houses approximately 400 companies. In addition to branches of multinational corporations, many small and medium enterprises are located here.

The port and industrial estate are divided into five zones:

- EcoPark: centrally located on the port and industrial estate at the Westelijks Insteekhaven (Western Dock). Here one finds energy-related and/or recycling companies in particular;
- Seaport: this zone is located to the east of EcoPark. Mainly companies with water-related activities, such as the storage and transhipment of goods, are situated here. Also, the service-oriented companies for shipping can be found here;
- IndustrialPark: this zone is located in the most western part of the industrial estate and forms its largest area. The chemical and industrial companies are located here;
- Distriboulevard & TradePark: these zones are respectively on the south side of the estate and to the south of the port's railway. Mainly logistics companies are situated here;
- ServicePoint: this zone is located in the south-eastern part of the industrial estate. Various companies and organisations are located here, such as Customs, the Military Police, the Moerdijk Port Authority and technical maintenance companies, providing services to the entire port and industrial estate.

The zoning ensures that similar companies are located in close vicinity to each other (company clustering). Hence companies may take full advantage of each other's presence.

The ‘port profile’ for the Moerdijk port and industrial estate is substantiated on the EcoPorts website. The ‘port profile’ can also be found in appendix 1 to this handbook.

1.3. PERS for the Moerdijk port and industrial estate

The environment and sustainability has long been an important topic at the Moerdijk port and industrial estate. Many initiatives have been undertaken to improve the environmental performance of the port and industrial estate. PERS helps to improve insight into the environmental performance and to create the relationship between the various initiatives.

By means of this report, an indication is given of how the Moerdijk Port Authority meets the requirements from the PERS. Reference is made to the existing initiatives as much as possible. The following table includes the requirements from the PERS, with an indication of where each requirement is included in the report.
The Programme Manager Spatial Development, Environment and Sustainability ensures that the report is updated once every two years.

Requirements from PERS		Location in handbook
1.1	Policy statement	Chapter 2
1.2	Environmental Aspects and Legal requirements	Chapter 3
1.3	Responsibilities and resources	Chapter 4
1.4	Conformity Review	Chapter 5
1.5	Environmental Report	Chapter 6
1.6	Best practices	Chapter 7

Table 1: Requirements from PERS version 4 February, 2011

2. POLICY AND OBJECTIVES

2.1 Moerdijk Port Authority environmental policy statement

The Moerdijk Port Authority organises the process of development, design, construction, issue, operation, management and expansion of the Moerdijk port and industrial estate.

The Moerdijk Port Authority strives for an optimum balance between the economic development of the area and the compatibility of the area with its surroundings. We do this by optimally utilising the opportunities for environment and sustainability. For this purpose, we have gained insight into the environmental aspects of the activities of the port and industrial estate and formulated an improvement plan. The ESPO Green Guide served as a guideline in this process.
In addition, various parties were identified which can contribute to improving the environmental performance and sustainability of the site. In cooperation with these parties (public organisations and companies), we have furthermore established the environmental and sustainability objectives for the port and industrial estate and detailed them in programmes.

The continuous improvement in the field of environment and sustainability is secured by:

1. implementing an environmental management system;
2. keeping informed about legislation and regulations and taking the necessary measures in order to comply with such legislation and regulations;
3. providing annual insight into the environmental performance of Moerdijk port and industrial estate;
4. communicating the environmental performance with employees, local residents and other interested parties;
5. setting requirements for the environmental performance of companies wishing to locate within the Moerdijk port and industrial estate;
6. informing the companies already established on how they can improve their environmental performance;
7. deploying the necessary knowledge and resources that are required to properly perform the environmental activities;
8. implementing the necessary measures to maintain, and if possible enhance, the landscape quality, biodiversity and other environmental factors.

Moerdijk, August 2014

Ferdinand van den Oever
Managing Director of the Moerdijk Port Authority

2.2 Port Strategy Moerdijk 2030

The Municipality of Moerdijk, the Province of North Brabant and the Moerdijk Port Authority have drawn up a Port Strategy for the future position of the Moerdijk Port and Industrial Estate. It is a vision and implementation agenda not only for the port itself, but also for its surroundings. The (spatial) liveability for the surrounding area is explicitly addressed in the Port Strategy; the objective being to find an appropriate balance between the harbours, the spatial quality, the social environment and the interaction between them.

The Port Strategy indicates that the combination of available space, industries and the ideal location on the water with inland connections offers plenty of opportunities for the Moerdijk Port and Industrial Estate to grow in the coming decades. This growth is necessary for the economy and employment in West-Brabant. In particular, there are opportunities in the area of sustainable logistics and sustainable development of the chemical and process industries. In this regard, Moerdijk intends to have a strong focus on the processing of containers that enter Europa via the Ports of Rotterdam and Antwerp. In addition, it will strive to increase the number of European short-sea shipping routes that call in at Moerdijk.

2.3 Duurzame Verbindingen Moerdijk (Moerdijk Sustainable Connections)

The Moerdijk Port Authority is the initiator of "Duurzame Verbindingen Moerdijk (also referred to as DVM). The DVM is a programme in which the following parties are collectively striving towards a leading sustainable Moerdijk Port and Industrial Estate:

- Moerdijk Port;
- Municipality of Moerdijk;
- Moerdijk Industrial Estate Business group (BIM);
- Province of North Brabant;
- Brabantse Delta District Water Board;
- Directorate-General for Public Works and Water Management South Holland.

The parties have jointly drafted the long-term programme Duurzame Verbindingen Moerdijk (Moerdijk Sustainable Connections) for the period 2011-2015. The DVM Long-term Programme shall run until 31 December 2015. The programme will be in keeping with existing projects as much as possible.

In the spring of 2013, the Core Team DVM has established a prioritisation of objectives on which to focus. By determining a focus, the objectives of the DVM projects can be summarised in a SMART manner and formulated into key performance indicators (KPIs).

A brief summary of the DVM projects is included in Appendix 3 to this report. The complete long-range programme, as well as information about the progress of the projects, can be found on www.duurzameverbindingenmoerdijk.nl.

2.4 Other environmental and safety-related plans

Safety is an important topic within the Moerdijk port and industrial estate. The Moerdijk port and industrial estate safety steering committee is active within the Moerdijk port and industrial estate. Besides the Port Authority, the Central and West-

Brabant Safety Region, the municipality of Moerdijk and Province of North Brabant all have a seat on this committee.

In the past year, the Port Safety Plan has been revised. The aim of the port safety plan is to describe the responsibilities, procedures and measures with respect to the prevention/reduction of the safety incidents that have a negative effect on the ports and on commercial maritime transport.

The Safety steering committee has drawn up a collective 'Moerdijk Port and Industrial Estate Safety Action Programme'. This includes the following actions in the field of safety:

- *Moerdijk Industrial Estate fire station:* In early 2013, a fire station was established and put into operation through a partnership between the Moerdijk Port Authority, the Central and West Brabant Safety Region, the Municipality of Moerdijk and the business community;
- *Self-reliance*: in cooperation with the Municipality of Moerdijk, the Regional Environmental Services, the Moerdijk Port Authority, Mark & Dintel, the Province of North Brabant and the Moerdijk Industrial Estate Business Group, the self-reliance of employees and residents in and around the Moerdijk Port and Industrial Estate will be stimulated. For example, windsocks have been placed and an evacuation plan is being developed;
- *Port Health Centre:* together with the Municipality of Moerdijk, the Moerdijk Port Authority, the Moerdijk Industrial Estate Business Group, the Municipal Mental Health Services (GGD), the Accident and Disaster Medical Assistance in the Region (GHOR), GPs and medical institutions, a Port Health Centre has been established. The main purpose of the centre is to provide emergency care to companies and seamen in need.

3. REGISTER OF ENVIRONMENTAL ASPECTS AND LEGAL REQUIREMENTS/PERFORMANCE INDICATORS

3.1 Procedure: register of environmental aspects and legal requirements

Purpose

The aim of compiling a register of environmental aspects and legal requirements is two-fold, i.e.:

- Identifying environmental aspects and determining the importance and priority in order to control these aspects;
- Gaining insight into the applicable and future legislation and regulations and ensuring that these regulations are complied with.

Area of application

The register includes the following components:

- port-related activities;
- site-related activities;
- organisational/environment-related activities;
- established companies;
- calamities and incidents.

The Moerdijk Port Authority has relatively little influence on the environmental aspects of the established companies. These issues are discussed in general terms.

Roles and responsibilities

The Programme Manager Spatial Development, Environment and Sustainability is responsible for the preparation, maintenance and management of the register of environmental aspects and legal requirements.

Procedure

a. Making an inventory of environmental aspects

The various activities that take place in and around the Moerdijk port and industrial estate and that have consequences for the environmental performance are included in the register. Per activity, an indication is given of the environmental aspects on which it has an influence, namely: waste materials, waste water, soil, use of raw materials, use of natural resources, air, noise and vibration, energy, public safety.

b. Establishing the applicable environmental legislation and regulations

For each activity it will be determined which environmental legislation and regulations are applicable. The applicable legislation and regulations are included in the summary of legislation and regulations. Here, an explanation is given of the relevant legislation and regulations.

c. Updating the register

The register will be updated at least once every two years or when there are major changes in the environmental aspects and/or legislation and regulations.

d. Reviewing legislation and regulations

After the updating of the register, an external expert will check whether all legislation and regulations are complied with (see also chapter 4 of this handbook). This check serves as input for the conformity review. If necessary, improvement actions will be put in motion.

Documents

The register is an Excel file, which can be inspected at the Moerdijk Port Authority.

3.2 Performance indicators

A monitoring report for the Moerdijk port and industrial estate has already been drafted since 1999. The monitoring report covers the environmental aspects of the Moerdijk port and industrial estate. The monitoring report also includes environmental aspects referred to in the register of environmental aspects and legal requirements. The following table includes the performance indicators that are reported on.

Indicator	Unit
established companies	% by sector
Applications handled by the establishment committee	Number
Employment	fte
Energy consumption	TJ
Air emissions (diverse parameters)	Kg/year
Water consumption (various streams)	m^3/year
Emissions via the water	various units
Waste (streams per processing method)	Tonnes/year
Logistical movements by water	Number of vessels Number of tonnes
Logistical movements by rail	Number of containers Number of tonnes
Logistical movements by road	Number
Nuisance (complaints)	Number

Table 2: performance indicators

The monitoring report 2012 further details the environmental performance of the port and industrial estate. See also Appendix 4 to this report.

The complete monitoring report can be found at:
http://dvmoerdijk.nl/wp-content/uploads/2013/12/Monitoringrapport-2012-5-12-2013.pdf.

4. ROLES, RESPONSIBILITIES, AUTHORITIES AND RESOURCES IN THE FIELD OF ENVIRONMENTAL ASPECTS

4.1 Moerdijk Port Authority

The Moerdijk Port Authority is a joint scheme and has two participants: the Province of North Brabant and the Municipality of Moerdijk. The Moerdijk Port Authority performs advisory, service and operational activities for development, construction, issue, management and operation of the Moerdijk port and industrial estate.
The Board of Directors of Moerdijk Port Authority is formed by representatives from the Provincial Council and the Provincial Executive of North Brabant and representatives from the Municipal Council of Moerdijk and the Municipal Executives of Moerdijk.
The organisation consists of a Managing Director, who is also the secretary of the Board of Directors, and 24 staff members.
The Moerdijk Port Authority can be characterised as a so-called 'governmental organisation'. Among other things, this means that the entire operational management is performed by third parties. Both the wet and dry management is outsourced to a third party. The Moerdijk Port Authority supports companies in the establishment process and, where appropriate, in acquisition activities and trade missions.
The figure below shows the organisation chart of Moerdijk port and industrial estate.

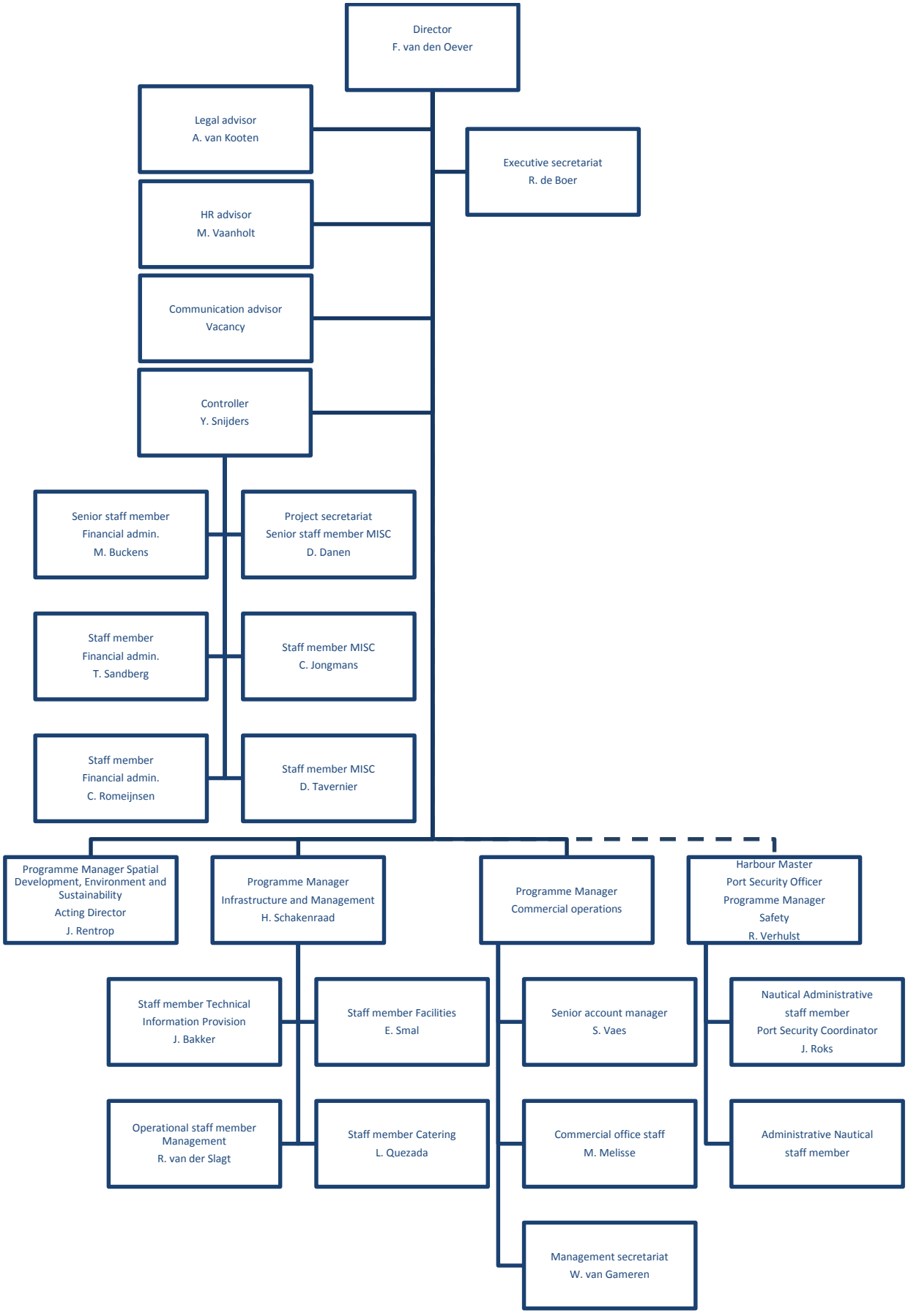

Figure 2: Organisation chart of Moerdijk Port Authority

4.2 Internal environmental roles and responsibilities

The following table indicates who is responsible for particular environmental tasks within the Moerdijk Port Authority.

Task	Function
Port operations (dredging)	Programme Manager Infrastructure and Management
Port operations (navigation)	Harbour Master - Port Security Officer - Programme Manager Safety
Port operations (shipping)	Harbour Master - Port Security Officer - Programme Manager Safety
Port operations (terminals)	Harbour Master - Port Security Officer - Programme Manager Safety
Jetty/Warf management	Harbour Master - Port Security Officer - Programme Manager Safety
Site management	Programme Manager Infrastructure and Management / Harbour Master - Port Security Officer - Programme Manager Safety
Strategic planning	Programme Manager Spatial Development, Environment and Sustainability / Managing Director
Supplies acquisition	Programme Manager Infrastructure and Management
Operator Licensing/Permit	Programme Manager Spatial Development, Environment and Sustainability
Quality management	Director
On site contractor management	N/A
Emergency planning	Harbour Master - Port Security Officer - Programme Manager Safety
Waste management	Harbour Master - Port Security Officer - Programme Manager Safety
Marina/slipway management	N/A
Environmental document management	Programme Manager Spatial Development, Environment and Sustainability
Environmental data management	Programme Manager Spatial Development, Environment and Sustainability
Soil pollution assessment	Harbour Master - Port Security Officer - Programme Manager Safety
Air quality monitoring	Programme Manager Spatial Development, Environment and Sustainability
Energy and Carbon Footprint monitoring	Programme Manager Spatial Development, Environment and Sustainability
Water quality monitoring	Programme Manager Spatial Development, Environment and Sustainability
Noise management	Programme Manager Spatial Development, Environment and Sustainability
Vehicular management of terminal traffic	Harbour Master - Port Security Officer - Programme Manager Safety
Communication with external stakeholders about environmental subjects	Programme Manager Spatial Development, Environment and Sustainability
Management Representative	Programme Manager Spatial Development, Environment and Sustainability
Coordinating environmental management throughout the port	Programme Manager Spatial Development, Environment and Sustainability
Reviewing of environmental issues and legislation	Programme Manager Spatial Development, Environment and Sustainability
Coordination DVM	Programme Manager Spatial Development, Environment and Sustainability
Session in steering committee DVM	Director
Civil engineering	Programme Manager Infrastructure and Management
Public relations and marketing	Communication advisor
Checking new establishments	Programme Manager Commercial Operations
Port authority workboats	Harbour Master - Port Security Officer - Programme

Task	Function
	Manager Safety

Table 3: Roles and responsibilities within the Moerdijk Port Authority

4.3 External environmental roles and responsibilities

In addition to the internal tasks, a number of roles and responsibilities in the environmental field also lie with external parties (see table below).

External party	Responsibility
The Directorate-General for Public Works and Water Management South Holland (previously the Ministry of Transport, Public Works and Water Management, now the Ministry of Infrastructure and the Environment)	Quality of public surface water (Hollandsch Diep).
The Province of North Brabant in cooperation with the Environment Agency for Central and West Brabant (OMWB)	Formulating spatial and environmental policies. Licensing and enforcement of companies with major environmental impact. Gathering complaints (OMWB). Collecting other environmental data.
Brabantse Delta District Water Board	Quality of wastewater discharged into sewer system and surface water (ditches).
The Municipality of Moerdijk in cooperation with the Environment Agency for Central and West Brabant (OMWB)	Formulating spatial and environmental policies Licensing and enforcement of companies on the site. Gathering complaints (OMWB). Collecting other environmental data.
Companies (established within the Moerdijk port and industrial estate)	The company is responsible for complying with the relevant applicable legislation and regulations (such as the requirements from the environmental permits and licences under the Water Act).
Park management	Performing industrial estate maintenance in accordance with agreements.

Table 4: External responsible parties

4.4 Resources

The Port Authority employs a Programme Manager Spatial Development, Environment and Sustainability. He is the contact person for environmental and sustainability activities at the port and industrial estate. Financial resources are made available for the various projects (see table below).

Cost	Resources
Staff costs	€ 150,000
Development plans	€ 15,000
Environmental monitoring	€ 27,000
DVM	€ 120,000
Environmental consultancy costs	€ 90,000
Dredging; allocation to dredging fund	€ 2,400,000

Table 5: Finances

5. CONFORMITY REVIEW

5.1 Procedure

Purpose
Reviewing the operation of the environmental management system. The result is used to produce measures to improve the environmental performance.

Area of application
The following topics are dealt with during the conformity review:
- the environmental policy and objectives;
- expected changes (new establishments, design of area, legislation and regulations);
- the register of environmental aspects and requirements;
- monitoring report;
- best practices.

Roles and responsibilities
The Programme Manager Spatial Development, Environment and Sustainability is responsible for the preparation of the conformity review. The Programme Manager Spatial Development, Environment and Sustainability performs the conformity review together with the Managing Director.

Procedure
a. Scheduling of conformity review
The Managing Director and the Programme Manager Spatial Development, Environment and Sustainability meet once every two years to discuss the conformity review.

b. Preparing management review
The Programme Manager Spatial Development, Environment and Sustainability ensures that the data needed for the conformity review are collected.

c. Discussing data
The Programme Manager Spatial Development, Environment and Sustainability and the Managing Director together discuss the data and determine areas for improvement.

d. Adjusting report
The results and the areas for improvement are reported by the Programme Manager Spatial Development, Environment and Sustainability. If necessary, other documents, such as policies, objectives, etc., are also adjusted.

Documents
The conformity review is detailed in section 5.2 of this report.

5.2 Results and areas for improvement of the 2014 conformity review

The conformity review took place on 30 June. The following were present at this conformity review:

- Mr F. van den Oever (Managing Director of the Moerdijk Port Authority);
- Mr J. Rentrop (Programme Manager Spatial Development, Environment and Sustainability Moerdijk Port Authority);
- Ms C.Tesselaar (BMD Advies advisor).

The results of the conformity review are used to formulate Chapter 2 'Policy and Objectives'.

The register of environmental aspects was discussed. No changes to the register have been made. Most environmental effects relate to the established businesses and the activities in and around the port. The Moerdijk Port Authority plays a stimulating role in achieving improvement together with the responsible parties.

In order to serve as an example for other companies in the vicinity, the Moerdijk Port Authority has invested heavily in the increased sustainability of its own operations in recent years. Several internal improvements have taken place, such as:

- the placement of solar panels;
- the installation of LED lighting and light detectors;
- the reduction of paper consumption by introducing paperless work methods and standard duplex printing;
- an increase in the sustainability of its own vehicle fleet;
- an increase in the sustainability of purchasing and tendering policies.

In recent years, sustainable thinking has become an even more integrated part of the entire organisation. Previously, the implementation and management were primarily the responsibility of the Programme Manager Spatial Development, Environment and Sustainability of the Moerdijk Port Authority. Today, this has been fully integrated throughout the organisation and is a standard part of business operations.

Previously, most environmental and sustainability objectives were laid down in the Duurzame Verbindingen Moerdijk (Moerdijk Sustainable Connections). In the past year, the objectives of the Moerdijk Port Authority have been reformulated and incorporated into the Port Strategy 2030. The Triple P-principle (People, Planet and Profit) was used as a starting point in this context. The idea underlying this principle is that sustainable development is a balanced development process, aimed at promoting the quality of nature, the physical and mental well-being of the residents, and sound economic development. The proper balance between these elements enhances not only the quality of the individual elements but that of the total sum of them. The Port Strategy is not only concerned with the vision of the port and industrial estate in 2030, but with the road towards the realisation of that vision as well.
The Port Strategy will also be the guideline for the DVM Long-term Programme to be developed after 2015.

The main environmental aspects were discussed during the meeting. The actions for improvement of these areas are briefly described below. The Moerdijk Port Authority

continues to focus its attention on the other environmental aspects, in both the DVM and the Port Strategy 2030.

Energy

Energy is an important environmental aspect within the Moerdijk Port and Industrial Estate. In recent years, many projects have been carried out with regard to the exchange of energy between the companies located on the site. In addition, the possibilities for the exchange of residual streams with the area surrounding the port and industrial estate have been examined.

The Moerdijk Port Authority, the Moerdijk Industrial Estate Business Group (BIM), the Municipality of Moerdijk and the Province of North Brabant have undertaken a project in which the feasibility of residual exchange links was clearly visualised. This concerned the exchange between companies located on the Moerdijk Port and Industrial Estate as well as the exchange with the surrounding area.
Some important conclusions are:

- using the residual streams in and around Moerdijk, a significant reduction in energy use and CO_2 emissions can be achieved: 30 million m^3 of natural gas and 57Kton of CO_2, respectively;
- three promising clusters have been defined with a positive financial result;
- in order to realise and operate these clusters, a separate organisation is needed.

A joint study has been initiated into an organisational model and a market orientation was conducted at relevant companies. The plan provides for a phased development process. The first phase should yield the results of the market orientation, including a global notion of a possible organisational model and a set of frameworks. Based on the results, the decision will be made whether or not to put out a tender.

Odour / Air Quality

The Moerdijk Port Authority, the Province of North Brabant, the Environment Agency for Central and West Brabant (OMWB), the Municipality of Moerdijk, the Directorate-General for Public Works and Water Management and a number of companies located at the Moerdijk Port and Industrial Estate are currently carrying out a collaborative project that examines the possibility of an online eNose network in and around the port and industrial estate.
The eNose is a tool for rapid and adequate information management during events and incidents in which gases that may cause nuisance, disturbance, anxiety and/or a sense of insecurity are released.
Since the system in Moerdijk is still in a research phase, no agreements have been made as yet with regard to a structured method.

Noise

In the past year, great success has been achieved with the 'Tradeable noise emission rights' project. For a further description of this project, please see section 6.2.

Relationship with the surrounding area

The Moerdijk Port and Industrial Estate adjoins several residential areas. The relationship between the port and industrial estate and its immediate vicinity is a point of particular interest. At times, this relationship comes under pressure from the increasing number of establishments on the site and the number of logistic movements.
Much attention is paid to this in the Port Strategy 2030. This not only pertains to being on good 'neighbourly' terms with surrounding areas, but also refers to the public

health of local residents, further strengthening the connection to the employment market and educational institutions, and increasing regional appeal.

6. SOLUTION FORMS

6.1 Nature management plan Moerdijk

Project description

The Moerdijk Port and Industrial Estate borders on the nature reserves of the Biesbosch and Hollandsch Diep. The emissions from the companies, including sulphur dioxide and nitrogen dioxide emissions, have an effect (external impact) on these two nature reserves. The Biesbosch and Hollandsch Diep are designated Natura 2000 habitats, a European network of nature reserves which are governed by the conservation measures of the European Birds and Habitats Directives. These nature reserves must be taken into account in case of further intensification or expansion of businesses at the Moerdijk Port and Industrial Estate. If companies wish to implement or expand activities on the site of the port and industrial estate, they must test the impact of these activities on nature in order to apply for a license.

There is also wildlife on the site of the Moerdijk Port and Industrial Estate. For example, birds such as buzzards, hawks, peregrines and sand martins have their nesting homes on the site, and various native orchids grow there as well. In the context of the nature management plan to be devised, these protected species will be identified and a map will be drawn up to provide insight into the specific areas where they are found.

Nature management plan Moerdijk
The Green Deal Moerdijk includes a declaration of intent for a nature management plan to govern the Moerdijk Port and Industrial Estate and its surroundings. By entering into Green Deals, the Government strives to help society to realise sustainable initiatives that are difficult to get off the ground. The purpose of the declaration of intent is to develop the activities in and around the port and industrial estate in relation to the quality of nature in such a way that:

- economic growth can continue to take place;
- ecological values are enhanced;
- the port and industrial estate is attractive for entrepreneurs and employees as a location of business activities;
- more support and experiential value will be created among local residents.

In addition to the Moerdijk Port Authority, the Moerdijk Industrial Estate Business Group, the National Forest Service in the Netherlands, the Municipality of Moerdijk and the Province of North Brabant are involved in the creation of the nature management plan. These parties jointly take part in the Nature study group, part of DVM.

It is expected that a first version of the nature management plan will be drawn up by the middle of 2014. Subsequently, the nature management plan will be a living document that will be periodically reviewed and adjusted.

Adoption Sassenplaat
Many terns and gulls have their nesting homes on the fallow land at the Moerdijk Port and Industrial Estate. As a result of the establishment of new businesses, however, the area of fallow land is decreasing, leaving less space for gulls. Consequently, they have started brooding on flat rooftops. This leads to pollution, clogged drain pipes and leakages. Also, when the birds have young, they will sometimes attack people. In anticipation of the nature management plan, the Moerdijk Port Authority has found a solution in consultation with the National Forest Service in the Netherlands. This solution consists of the adoption of a part of the Sassenplaat by the Port Authority. The Sassenplaat is a desert island and beautiful nature reserve in the Hollandsch Diep, opposite the port and industrial estate. Birds are willing to relocate to the island, provided that the land is kept bare and arid. The Port Authority ensures such conditions by assuming responsibility for the mowing management on the island so preventing the growth of shrubs and trees. In this way, the Port Authority has found a sustainable solution for these birds. Already, hundreds of gulls have found their way to the Sassenplaat. One of the implementation plans, arising out of the nature management plan, aims to explore the opportunities and possibilities of realising more space for these waders on the Sassenplaat.

Impact on environmental aspects
The project has an impact on the following environmental aspects:

- soil;
- air;
- water;
- nature.

Stakeholders involved

- Moerdijk Port;
- Companies within the Moerdijk port and industrial estate;
- Moerdijk Business Group (BIM);
- Municipality of Moerdijk;
- Province of North Brabant;
- National Forest Service in the Netherlands;
- The Directorate-General for Public Works and Water Management;
- The Biesbosch National Park.

Contact for information

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Website:	http://www.buijsecoconsult.nl/

6.2 Tradeable noise emission rights

Project description

In 2014, the project 'Tradeable noise emission rights' was completed and submitted to the Ministry of Infrastructure and the Environment. The 5 sea port companies are preparing a work programme 2014-2016 in collaboration with the Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs. The project 'Tradeable noise emission rights' may be used as an experiment in the work programme 'Sea ports 2014-2016 '. The objectives of this project are to examine the feasibility of a clear and accessible system of tradeable noise emission rights and to design such a system.
The noise emissions at the zone control points form the starting point for this. The purpose of the tradability of noise emission rights between companies is to achieve the environmental objective, namely to limit the total noise impact on the environment, in a more cost-effective manner than would be possible through regulation.

The companies located at the Moerdijk Port and Industrial Estate are in possession of a current license under the Dutch Environmental Protection Act (Wet Milieubeheer). Although the licenses are kept up-to-date as much as possible, research has shown that much of the noise allowance for which a license has been issued remains unused. This is often the result of changing work methods, abandoned business activities or the use of modern, more low-noise equipment or processes.
By assigning a value to the noise emissions and thus to the noise allowance, noise allowance becomes an economic factor. As a result, the value of noise is made transparent and is given a book value. Based on this book value, noise can be traded. The economic value can be used to weigh whether taking noise reduction measures at existing companies when business activities are modified or substituted should be considered a cost or an investment. This encourages low-noise operations and makes intensification possible for the entire port within the existing noise limits.

A system of tradeable noise emission rights makes taking noise reduction measures more economically justified. Therefore, costly measures that enable activities at a specific location may be obviated, for example, by taking cheaper measures at a different location. The system of tradeable noise emission rights must be coordinated with environmental licenses. Also, limits must be imposed on the rights to be traded. For example, a company must at least retain the noise emission rights for the noise it produces in the course of its own activities.
In addition, the legal status must be clearly established. A central registration system will need to be set up, tailored to the noise zone management model. Matters such as enforcement and possible penalties must also be further developed. The system must be designed in such a way that it can theoretically be applied to all ports and other zoned industrial estates.

Stakeholders involved

- Moerdijk Port;
- Companies within the Moerdijk port and industrial estate;
- Municipality of Moerdijk;
- Province of North Brabant;
- The Environment Agency for Central and West Brabant.

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APPENDIX 1: MOERDIJK PORT AND INDUSTRIAL ESTATE PROFILE

See http://www.ecoports.com/user/port_profile

APPENDIX 2: SDM CHECKLIST

(will be added as a separate attachment)

ANNEX 3: DVM LONG-RANGE PROGRAMME PROJECTS 2011-2015

The DVM Long-term Programme shall run until 31 December 2015. The programme will be in keeping with existing projects as much as possible. In the spring of 2013, the DVM team has established a prioritisation of objectives and focusses. By determining a focus, the objectives of the DVM projects can be summarised in a SMART manner and formulated into key performance indicators (KPIs).

DVM will focus on the following projects:

1. Energyweb

Description
The Moerdijk Port Authority, the Province of North Brabant, the Municipality of Moerdijk and the Moerdijk Industrial Estate Business Group (BIM) together examined the possibilities for the beneficial use of energy/heat that is blown into the air. They investigated whether an optimum exchange of energy/heat could be made possible by means of a loop system.

The EnergyWeb Moerdijk project currently includes 4 subprojects:
- Cluster Appelweg heat network: realisation of a heat network between a company that supplies residual heat and 2 companies that use residual heat;
- Middenweg cluster: exchange of steam, CO_2 and residual heat between various companies on the Middenweg;
- Vlasweg cluster: supply of steam and residual heat to and from companies situated on the Vlasweg;
- Westelijke Randweg cluster: supply of steam to existing and new companies on the Westelijke Randweg.

In addition to the EnergyWeb project, a project entitled EnergyWeb XL exists. This project examines whether heat and/or CO_2 can be supplied to locations outside the port and industrial estate. At this time, the Spiepolder area is being considered for this purpose. The Spiepolder is a greenhouse area in the immediate vicinity of the Moerdijk Port and Industrial Estate. In the next 10 years, this greenhouse area will almost triple in size. The Spiepolder project explores the possibility of supplying the greenhouse industry with heat and CO_2 from the Moerdijk Port and Industrial Estate.

Objective
The reduction of energy consumption and CO_2 emissions at the Moerdijk Port and Industrial Estate.

2. Environmental complaints

Description
The Municipality of Moerdijk and the Province of North Brabant have designated the Environment Agency for Central and West Brabant (OMWB) as the central control agency for registering and processing environmental complaints and reports originating from the Municipality of Moerdijk. Filed complaints are routed directly to

the OMWB. The victim of the nuisance is contacted immediately and the source of the nuisance is examined and, if possible, removed.
The results are reported to the notifier. At the location of the perpetrator, the cause of the nuisance is removed immediately if possible. If this is not possible, a subsequent course of action is initiated in consultation with the Municipality of Moerdijk or the Province of North Brabant. The regular supervisor of the perpetrating company will take over this subsequent course of action.

Objective
Improving the processing of environmental complaints and improving the communication about this, with the aim of reducing the number of complaints and thereby improving the living environment.

3. Noise

Description
The Moerdijk port and industrial estate is a zoned industrial area in conformity with the Noise Pollution Act. The companies that are established on the site may, together, not exceed the noise level set for the zone. Because of the dynamics of the Moerdijk port and industrial estate, this noise zone receives constant attention in the case of developments, such as the expansion of companies and new businesses. Therefore, the Noise study group was created in order to follow or anticipate developments in the field of noise.

Objective
The objectives of the Noise study group are:
- Following and, if possible, anticipating (policy) developments in the field of noise (zoning);
- The search for noise allowance, primary for new activities, new establishments.

4. Water study group

Description
The Water study group was created with the primary objective of optimising the water chain (including the waste water system) at the lowest possible cost to society. The Water study group is comprised of representatives from the Brabant Delta Water Board, Brabant Water, the Directorate-General for Public Works and Water Management South Holland, the Municipality of Moerdijk, the Province of North Brabant, the Moerdijk Port Authority and various companies that are situated on the Moerdijk Port and Industrial Estate.

Objective
The objectives of the Water study group include:
- the optimisation of the water chain (including the waste water system) at the lowest possible cost to society;
- Preventing contamination;
- water-neutral construction, which is to say that the layout is suited to the properties of the water system in order to prevent any unwanted (subsoil) water level elevation or depression from needing to be applied and to ensure efficient drainage and dewatering.

5. Monitoring

Description
Within the Moerdijk Port and Industrial Estate, (environmental) information has already been collected annually since 1999 by companies and (government) agencies and presented in the so-called 'Monitoring Report Moerdijk Port and Industrial Estate'.
The monitoring report is, on the one hand, used as to provide information to parties involved in the port and industrial estate (such as companies, local residents, government bodies, etc.). On the other hand, the information is used to initiate the various sustainability activities within the Moerdijk Port and Industrial Estate. In 2013, the focus of the monitoring report has shifted more to environmental issues. In addition to the chapter on environmental complaints, the environmental aspects on energy, waste, air, water, noise and nature have been specifically included in the report.

Objective
The objective of the annual monitoring is threefold:
1 The provision of information to third parties and stakeholders about the (environmental) impact on the Moerdijk port and industrial estate;
2 disclosure of the results of the sustainability projects performed as part of the DVM Long-term Programme 2011-2015;
3 The monitoring data serves as input for various sustainability projects that are performed within the Moerdijk port and industrial estate.

6. The Nature study group

Description
There is a lot of discussion about the implementation of the Directives (Birds and Habitats) in the Natuurbeschermingswet (Nature Conservation Act) in relation to the designated area of the Hollands Diep and the draft designation for the Biesbosch area. These so-called “Natura 2000” areas have considerable influence on the further intensification and expansion of companies within the Moerdijk port and industrial estate. A number of companies have already encountered problems as a result of this.

Objective
The aim of this study group is to improve communication between the business community and the competent authorities and find solutions for the problems with respect to Natura 2000 for the various companies. This particularly concerns an area-based approach for the Natura 2000 issues. The objective of the Natura 2000 study group includes the following elements.

- investing in more robust nature, while not harming business operations (creating room for experimentation);
- nature management plan of the Moerdijk Port and Industrial Estate and surroundings, with the related economic development needs (2014-2030).

7. The Communication study group

Description
All projects within DVM are followed by the Communication study group. The leaders of the study groups are responsible for the timely involvement of the Communication study group in projects. The study group may offer advice on the course of action to be followed in individual projects with regard to communication. The leadership of the Communication study group lies with the Moerdijk Port Authority. As such, it performs a central role in the implementation of the communication plan, together with the Municipality of Moerdijk. Other participants in the Communications study group are the Province of North Brabant and the Brabant Delta Water Board.

8. Other

The following projects or study groups are not part of the DVM focus. The projects shall be continued or safeguarded as follows:

- **Establishment Committee:** is part of the zoning policy of the Moerdijk Port Authority.
- **BIM Knowledge Platform:** These meetings can, if necessary, be attended by various officials from the companies established within the Moerdijk Port and Industrial estate and take place 3 to 4 times per year. The meetings are dedicated to the exchange of information on current issues. Getting to know the other companies on the industrial estate can lead to a greater mutual understanding and sometimes even to an increase in private sales to peer-companies.
- **Moerdijk sustainability frontrunners:** will be followed-up on in the BIM meetings.
- **Mobility:** is performed by the mobility management organisation of the Province of North Brabant. The Municipality of Moerdijk and the Port Authority will ensure the linking and safeguarding of this project in the 3 Os ('overheid, onderwijs en onderneming': government, education, and enterprise) meetings.

ANNEX 4: MONITORING REPORT 2012

See also:
http://www.havenvanmoerdijk.nl/nl/havenschap_publicaties_monitoringrapport.htm

3. ENERGY

3.1 Data and interpretation

In 2012, the e-mjv (digital environmental annual report) companies together purchased 7,457 TJ (Terra joules) of electricity and 20,636 TJ of natural gas. In addition, the companies use other fuels such as diesel and petrol, in addition to waste materials, biomass and waste gases, for example. These are converted into heat or electricity by a number of companies on the site. Of the 18 companies examined, six state in their annual environmental report that they themselves generate energy. The total amount of energy generated is 12,938 TJ. The heat is used by the companies themselves or supplied to other companies. Further information is contained in section 3.2 under the heading EnergyWeb. The heat is used by the companies themselves or supplied to the electricity grid.

A part of the electricity and heat generated by the companies is sustainable.
The environmental reports do not reveal what part of the energy is generated in a sustainable manner. The Sustainable Energy Monitor West Brabant 2012, an initiative of 18 West Brabant municipalities and the Zeeland Municipality of Tholen, shows that in these municipalities together 7.27% of the total energy generated is generated sustainably through wind energy, biomass and/or measures in existing construction. The Moerdijk Port and Industrial Estate contributes approximately 12% to this in the form of wind energy and biomass.

3.2 Projects and opportunities

The most important opportunities for the Moerdijk Port and Industrial Estate are energy conservation and the use of renewable energy sources. This is the reason for several projects in progress that have an impact on the use of energy. The largest of these projects is EnergyWeb.

EnergyWeb
The Moerdijk Port Authority, the Province of North Brabant, the Municipality of Moerdijk and the Moerdijk Industrial Estate Business Group (BIM) together examined the possibilities for the beneficial use of energy/heat that is blown into the air. This resulted in the EnergyWeb project, which investigated whether an optimum exchange of energy/heat could be made possible by means of a loop system.

Today, heat and other flows are exchanged between the following companies at the port and industrial estate:

- Shell supplies steam to Basell Benelux B.V., Attero B.V. and Erca Emery Surfactants B.V. Attero B.V. also returns a supply of steam to Shell. Basell Benelux B.V. supplies waste gases to Shell;
- Attero B.V. supplies steam to Essent Energie Productie B.V., which in turn returns a supply of steam to Attero B.V.;
- Dr. W. Kolb B.V. supplies steam to Bertschi;

- Bewa supplies heat to the neighbouring companies Drecht Coating Services and Bolsius Grondstoffen.
- a part of the CO_2 emissions by Shell and SNB are supplied to Omya via a pipeline. Omya uses the CO_2 in its manufacturing process;
- The ethylene oxide which is generated by Shell as a by-product is used as raw material by Erca Emery Surfactants B.V. and W. Kolb.

By now, the case study for the Middenweg location has also been completed. There are good prospects for the realisation of a steam pipe between Ardagh Glass Moerdijk, Stolthaven Moerdijk B.V., GCA Nederland and Frans de Wit International B.V.
In the long term, the Conline Company can also be connected.

EnergyWeb XL
In addition to the EnergyWeb project, a project entitled EnergyWeb XL exists. The question of the study is whether heat and/or CO_2 can be supplied to locations outside the port and industrial estate. It has been investigated, for example, whether a sustainable energy supply that is yet to be realised can be created for the Moerdijk Logistics Park.
The Spiepolder area is also looked into. The Spiepolder is a greenhouse area in the immediate vicinity of the Moerdijk Port and Industrial Estate. In the next 10 years, this greenhouse area will almost triple in size. The Spiepolder project explores the possibility of supplying the greenhouse industry with heat and CO_2 from the Moerdijk Port and Industrial Estate.

Wind energy
Wind energy is generated at various locations within the Municipality of Moerdijk. There are three wind turbines on the site of the Moerdijk Port and Industrial Estate: two on the Middenweg and one on the TradePark. The total capacity of the three wind turbines is over 2 MW (Megawatts). It is expected that the number of wind turbines on the port and industrial estate will be further expanded to create a set of seven or eight wind turbines that together can generate energy for 14,000-17,000 households.


Wind turbine

There is great support for the application of sustainable energy among the residents of the Municipality of Moerdijk. When locations for wind turbines are assigned or projects are actually realised, however, the resistance among residents in the immediate vicinity is great. An important reason for this is that local residents are

generally faced with the disadvantages only and do not reap the benefits. This is different when residents are involved in the development of the wind energy projects and share in the benefits. The yields of wind turbines are then (partially) used for affordable, clean and sustainable energy or for other social causes, such as energy conservation. The municipality has included this principle in the new Memorandum Wind Energy under the heading 'social wind energy'.

The objective is to encourage residents, employers and the municipality to work together in a new organisational form. For each project, the parties will agree on the contribution of the project to local social causes. The Council considers local civic initiatives as leading in this process. The role that the municipality envisions for itself, is one of setting frameworks, evaluation (statutory duties) and support.

LED lighting Moerdijk
LED lighting is an energy-efficient form of lighting with a long lifespan. That is why the Moerdijk Port Authority has installed LED lighting on the public road (Energieweg) as a pilot project. In the future, the possibility of replacing existing lighting by LED lighting will also be examined.
Within the Moerdijk Port and Industrial Estate, several companies have been designated front runners in the field of sustainability. These front runners wish to encourage other companies as well to integrate sustainability into their business operations. One of the companies has heavily invested in LED lighting and wants to inform other companies about the possibilities, advantages and costs of this type of lighting.

Biobased West Brabant
Fossil fuels, such as oil, still form the basis for almost all products today. In a biobased economy, these fossil fuels are replaced by green resources as much as possible. Moerdijk is an important economic hotspot and has much to offer in the biobased area. Therefore, the Moerdijk Port and Industrial Estate, Nieuw Prinsenland and the Green Chemistry Campus have been designated biobased top locations under the top sectors policy. For a strong development of a biobased economy, it is essential that the biobased initiatives within the Moerdijk Port and Industrial Estate (such as the EnergyWeb and the presence of biomass power plants) are linked to other top locations. In that way, the knowledge gained at Moerdijk and at other top locations can be shared.
To further investigate the possibilities with regard to biobased initiatives within the Moerdijk Port and Industrial Estate, a survey was initiated in 2013 of the companies that can and want to strengthen the biobased region. Upon completion of the survey, biobased projects will be set up to be performed by those clusters of companies. The intention is to have both Moerdijk companies and companies from other parts of the region participate in this.

Solar energy
The possibility is being investigated of installing solar panels at the Moerdijk Logistics Park that is yet to be realised. This could also be looked into for other parts of the Moerdijk Port and Industrial Estate. It is expected that this would only be of interest to the smaller companies, since they pay higher energy prices than the large companies.

4. AIR

4.1 Data and interpretation

The companies within the Moerdijk Port and Industrial Estate emit various substances into the air. The large companies report on such emissions in their annual environmental report. Figures 4 and 5 show the air emissions generated by these companies between 2008 and 2012.

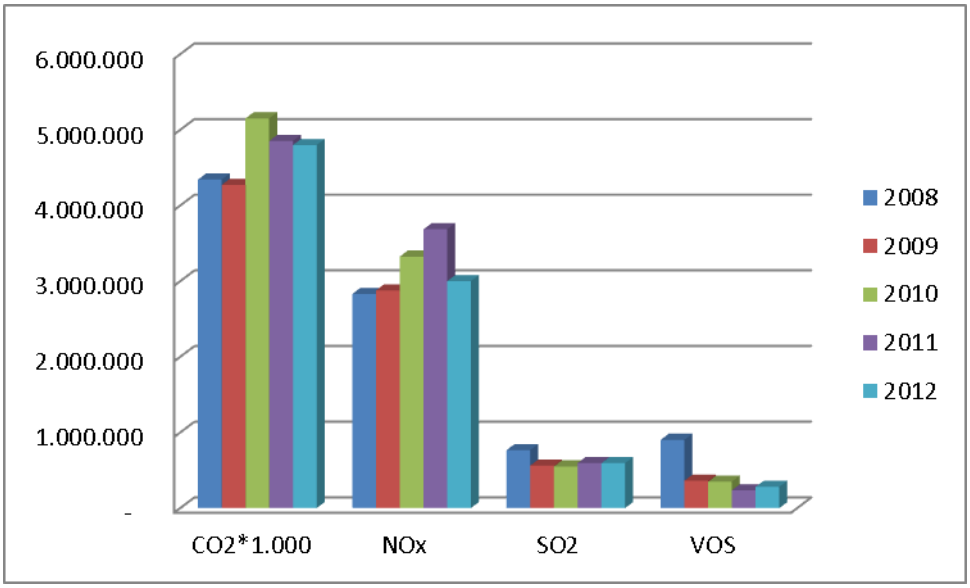

Figure 4: Air emissions in kilograms, 2008 to 2012

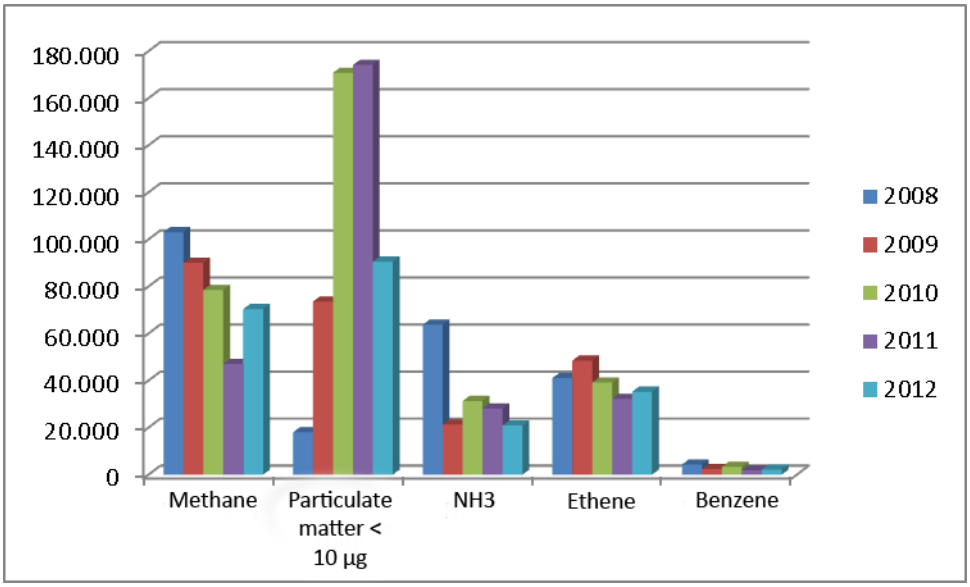

Figure 5: Air emissions in kilograms, 2008 to 2012

Air pollution

Of all the environmental influences, air pollution has the most significant impact on public health. The air quality in the Netherlands has greatly improved in recent years. The three largest sources of air pollution in the Netherlands are, in order of contribution:

- traffic;
- intensive livestock farming;

- industrial companies.

Air pollution is a global problem, just like climate change. In order to protect residents and nature against the negative effects of exposure to pollutants, emission limit values have been set at a European level for nitrogen dioxide (NO_2), benzene, lead, sulphur dioxide (SO_2) and particulate matter, among others. Ammonia (NH_3), volatile organic compounds (VOC) and ethene also have an impact on air quality.

Particulate matter contains small particles that are harmful to your health. Particulate matter contributes to smog, just as sulphur dioxide, nitrogen dioxide and ethene. In addition, the emissions of sulphur dioxide and nitrogen dioxide in combination with the emission of ammonia, lead to acidification.
The companies within the Moerdijk Port and Industrial Estate emitted about as much sulphur dioxide (SO_2) in 2012 as they did in 2011. The emission of particulate matter, NO_x (consists for the most part of NO_2), VOC and ammonia has decreased to approximately the level of 2009. This is due to a decrease at the individual companies.

The Province of North Brabant has commissioned the National Institute for Public Health and the Environment ('Rijksinstituut voor Volksgezondheid en Milieuhygiëne', RIVM) to test the air quality near the port and industrial estate in the period between 2008 and 2012 for concentrations of particulate matter and NO_2. As of 2010, benzene concentrations are also measured. These substances have the greatest impact on public health. The purpose of these measurements is to establish compliance with European emission limit values and to determine the contribution of the port and industrial estate to its surroundings. Table 2 shows the date for the period between 2008 and 2011. The data relating to 2012 were not yet available at the time this report was drawn up.

Table 2: Results of air quality studies 2008 to 2011 (2012 data not yet available)

Year	Concentration (µg/m^3)	Emission limit value under the Dutch Environmental Protection Act (Wet Milieubeheer) (µg/m^3)	Average contribution industrial estate in (µg/m^3)	Average contribution industrial estate in %
Particulate matter (PM_{10})				
2008	25.4		2.9	11
2009	23.3	40	0.9	4
2010	25.5		0.3	1
2011	26.2		1.0	4
NO_2				
2008	28.9		3.7	13
2009	25.2	40	3.3	13
2010	28.0		2.1	7
2011	26.5		3.5	13
Benzene				
2008				
2009				
2010	1.8	5	0.5	29
2011	1.9		0.7	37

The measured annual average emissions of particulate matter, NO_2 and benzene are well below the emission limit values specified in the Dutch Environmental Protection Act (Wet Milieubeheer). The 2011 monitoring report of the National Air Quality Cooperation Programme ('Nationaal Samenwerkingsprogramma Luchtkwaliteit ", NSL) indicates that the aforementioned concentrations of particulate matter and NO_2 are at the level that is average for the Netherlands. The contribution of the port and industrial estate to the emission of all substances is increasing compared to 2010. This can be explained (in part) by differences in the prevailing wind directions. Higher NO_x and particulate matter emissions by the companies may also be a cause in 2011.

The Province has decided to continue measuring the air quality in and around the Moerdijk Port and Industrial Estate in the period 2013-2018.

Climate change
The emissions of carbon dioxide (CO_2) and methane are the main causes of the greenhouse effect. The greenhouse effect causes the atmosphere to retain heat, as a result of which the temperatures on earth rise. These climate changes can be harmful to life on earth: both to nature and to the world's population. Climate change is a global problem. Therefore, policies have been drafted on a global as well as a European level to combat climate change.

The CO_2 emissions of the companies within the Moerdijk Port and Industrial Estate decreased slightly in 2012 compared to 2011. Research that was commissioned by the municipality shows that approximately 80% of the CO_2 emissions in the Municipality of Moerdijk originate from the companies within the Moerdijk Port and Industrial Estate. The emissions of methane have increased in 2012. This is due to a process disruption at one of the companies.

4.2 Projects and opportunities

The objective of the Municipality of Moerdijk is to decrease the emissions of CO_2 within the Moerdijk Port and Industrial Estate by 10% in 2030 (compared to 2009).[1] In this way, the municipality wants to contribute to the achievement of the EU objectives for the Netherlands. The European Union plays an important role in the CO_2 emission reduction at large companies. The main objective of the European trading system for greenhouse gas emission allowances is to reduce emissions of CO_2. Within the Moerdijk Port and Industrial Estate, five companies fall under the CO_2 emission allowance trading system. From 2013 to 2020, the quantity of emission allowances will be limited by 21% compared to 2005. The Municipality of Moerdijk expects that this will also help to reduce the CO_2 emissions within the Moerdijk Port and Industrial Estate.

In recent years, DVM has invested heavily in the reduction of the CO_2 emissions within the Moerdijk Port and Industrial Estate. The existing links between companies are contributing to the reduction of CO_2 emissions. Good examples are the supply of CO_2 by Shell and SNB to Omya and the EnergyWeb and Spiepolder projects as described in Chapter 3 Energy.

[1] Umbrella Policy Document Living Environment 2012-2030, Municipality of Moerdijk

5. WATER

5.1 Data and interpretation

Figure 6 shows the intake and discharge of water flows by the companies within the port and industrial estate.

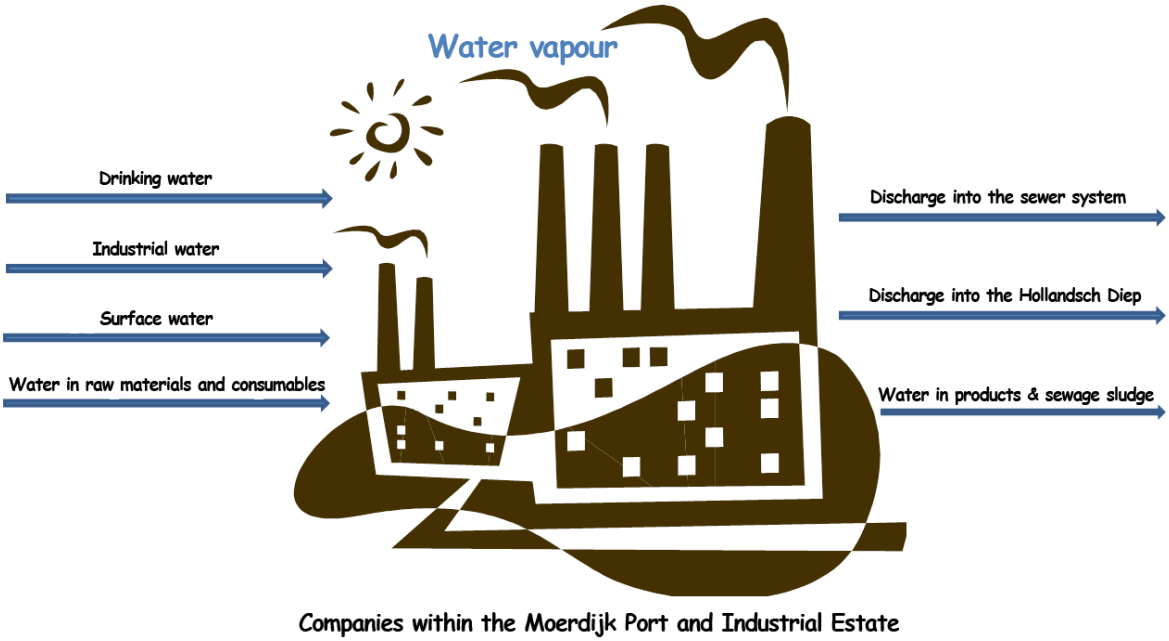

Figure 6: Water flows within the Moerdijk Port and Industrial Estate

Table 3: Water intake and discharges 2009 to 2012

	2009	2010	2011	2012
	In m^3	In m^3	In m^3	In m^3
Drinking water	1,160,000	1,314,000	1,286,000	1,171,000
Industrial water	5,250,000	5,560,000	5,722,000	5,697,000
Surface water	1,012,811,000	984,133,000	982,665,000	1,018,606,000
Discharge into the sewer system	6,032,000	6,095,000	5,750,000	6,216,000
Discharges to surface water	1,009,663,000	983,350,000	982,034,000	1,017,005,000 [2]

Intake

There are two types of mains water available at the Moerdijk Port and Industrial Estate: drinking water and industrial water. Industrial water is water of a lower quality than drinking water. It can be used for business processes such as the cleaning or cooling of machines, or the preparation of demineralised water. In contrast to drinking water, industrial water is not produced using subsoil water, but uses surface water instead. This is possible because the quality requirements for industrial water are less stringent than the requirements for drinking water. This is in keeping with the policy of the Province of North Brabant to develop alternatives for the use of water that is not intended for human consumption. In this way, less subsoil water needs to be used. Within the Moerdijk Port and Industrial Estate, 83% of the mains water that is taken in consists of the more sustainable industrial water. This is 60% of the total amount of industrial and process water supplied by HydroBusiness (part of Brabant

[2] The verification of the Directorate-General for Public Works and Water Management regarding the data on cooling water discharges was not yet available at the time of printing of this report.

Water N.V.) in Brabant. Consequently, the Moerdijk Port and Industrial Estate is the largest consumer of industrial water in Brabant.
Currently, the industrial water is consumed by ten companies within the Moerdijk Port and Industrial Estate.

A number of companies within the port and industrial estate is taking in surface water from the Hollandsch Diep. This flow is used for cooling.

Water also enters the companies via the intake of raw materials and consumables. Since not all companies report on this manner of water intake, it has been kept out of the monitoring report.

In addition to the flows mentioned in Figure 6, another approximately 894,000 m^3 of subsoil water is pumped up by the companies. This water is pumped up as a part of subsoil water management, to prevent soil contamination that occurred in the past from spreading further.

Discharges
There are two types of discharges in which the companies engage: the indirect discharge of waste water into the sewer system and the direct discharge of cooling water into the Hollandsch Diep.

The waste water that is discharged into the sewer system by the companies is transported via a high-pressure pipeline to the purification plant of the Brabant Delta Water Board in Bath. This is where the water is purified. The contamination of waste water is expressed in contamination units ('vervuilingseenheden', v.e.). The more contamination units a company produces, the higher the cost of the pollution levy. The water discharged into the sewer system by the companies within the Moerdijk Port and Industrial Estate contained a total of 84,465 contamination units. Compared to 2011, the number of contamination units has increased by 9%. The volume of the discharges has increased as well, namely by 8%.

The water that is extracted from the Hollandsch Diep for cooling purposes, is discharged into the Hollandsch Diep as well. The cooling process heats up the water. The degree to which the water is heated up is expressed in megawatts. In 2012, 950 MW[3] was discharged by the companies.

Rainwater that falls on the port and industrial estate is drained away through the sewer system, the surrounding ditches and the Hollandsch Diep.

Finally, water also leaves the companies through water vapour, in products and in sewage sludge. The volume of these flows is unknown, as not all companies report on them.

5.2 Projects and opportunities

Various projects relating to water have been carried out in the past within the Moerdijk Port and Industrial Estate. Both in 2002 and 2009, a study was conducted with regard to the optimisation of the water chain within the Moerdijk Port and Industrial Estate. In 2009, the possibility was explored of purifying the waste water

[3] The verification of the Directorate-General for Public Works and Water Management regarding the data on cooling water discharges was not yet available at the time of printing of this report.

from companies located within the Moerdijk Port and Industrial Estate and then reusing the purified water instead of discharging it into the sewer system and having it purified in Bath. This proved to be technically possible, but financially infeasible at the time.

The high-pressure pipeline for waste water has now been in use for 40 years. Before considerable investments are again made to maintain the high-pressure waste water pipeline, the system is (re-)tested for its compliance with today's requirements. This study 'Future Vision AWP/Bath' has been conducted since July of 2013 and is carried out by the Brabant Delta Water Board in cooperation with the main stakeholders in the area. Its objective is to develop a joint future vision that is supported by all. This strategic vision is expected to be formulated at the end of 2013.

In 2013, the DVM Water study group will make an inventory of concrete common problems and opportunities we can expect to encounter with regard to water. All of this with the aim of possibly tackling one (or some) of these problems/opportunities together in 2014 and 2015. Possible issues are:

- the impact of the various cooling water discharges in relation to the limited heat capacity of the Hollandsch Diep;
- sustainable site management to prevent chemical pesticides from entering into surface water;
- faulty connections to sewer systems in the sections of the industrial estate with regard to which this has not yet been addressed;
- the development of an assessment framework for industrial companies pertaining to the release of sub-water flows (discharges) from the sewer system to surface water;
- promoting the use of industrial water instead of drinking water within the industrial estate.

With regard to the point about the use of industrial water, the account managers of Brabant Water continue to discuss this issue with the companies that are using a lot of water. In consultation with these companies, the possibility of using industrial water is explored. The transition to industrial water is not always feasible, however, since it requires changes in processes and facilities. It is recommended to discuss the possibility of using industrial water already early in the establishment process (for example: when releasing the new sites), so that it can be taken into account during the design phase of the new companies and during the construction of infrastructure. To this end, the topic of industrial water could be included in the application form to be submitted to the Establishment Committee.

6. WASTE

6.1 Data and interpretation

Companies that provide annual environmental reports, also report on the discharge and processing of waste materials. Table 4 shows the amounts of waste materials discharged for the e-mjv (electronic annual environmental reports) companies for the years 2009 to 2012.

Table 4: Discharged waste 2009 to 2012

Waste	2009	2010	2011	2012
	In tonnes	In tonnes	In tonnes	In tonnes
Non-hazardous waste	741,000	1,488,000	1,187,000	1,182,000
Hazardous waste	421,000	344,500	393,000	490,000
Total	**1,162,000**	**1,832,000**	**1,580,000**	**1,672,000**

Figure 7 shows the processing methods for waste materials from the e-mjv companies in 2012. Just as in previous years, the majority of the waste materials is reused, i.e. 81%. 14% of the discharged waste materials is used to generate energy (for use as fuel and incineration). Only 5% is dumped.

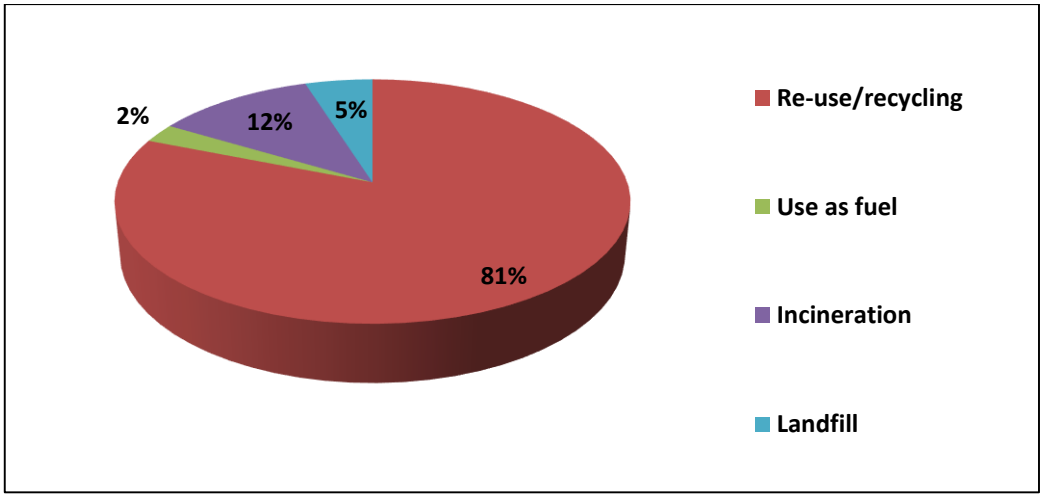

Figure 7: Processing method waste materials 2012

In addition to the discharge of waste materials, the companies within the Moerdijk Port and Industrial Estate play an important role in the processing of waste materials. In total, there are 31 companies located at the industrial estate that receive waste materials, process them and/or use them as raw materials in their production process. In 2012, this pertains to a total of 5,335,700 tonnes of waste.

6.2 Projects and opportunities

As indicated in section 6.1, various companies within the Moerdijk Port and Industrial Estate convert residual waste into energy; see Chapter 3 Energy. In addition, there are many partnerships between companies whereby (residual) products of one company are used as a raw material by the other company. One example of this is the partnership between Afvalstoffen Terminal Moerdijk B.V. and Martens en Van Oord. The soil that is purified at Afvalstoffen Terminal Moerdijk B.V., is stored and distributed by Martens en Van Oord. A conveyor belt is used for this purpose in order to avoid road transport. As a result, approximately 27,000 lorry movements will be prevented on the site.

When new companies are established at the Moerdijk Port and Industrial Estate, opportunities can be found in the areas of using waste materials as raw materials or transferring energy that is released in the process of incinerating waste materials. For this reason, during the acquisition phase the residual wastes generated by a company should already be taken into account when selecting a location for the company.

7. NOISE

7.1 Data and interpretation

The Moerdijk port and industrial estate is a zoned industrial area in conformity with the Noise Pollution Act. The companies that are established on the site may, together, not exceed the noise level set for the zone. In this way, the residential areas surrounding the port and industrial estate are protected against noise pollution. In 2012, 8 complaints were lodged regarding noise pollution at the port and industrial estate (see also Chapter 8: Nuisance). In addition to noise pollution that is caused by companies within the Moerdijk Port and Industrial Estate, local residents may also experience nuisance that is caused by the (national) roads and railways in and around the port and industrial estate. This noise is not included in the zone.

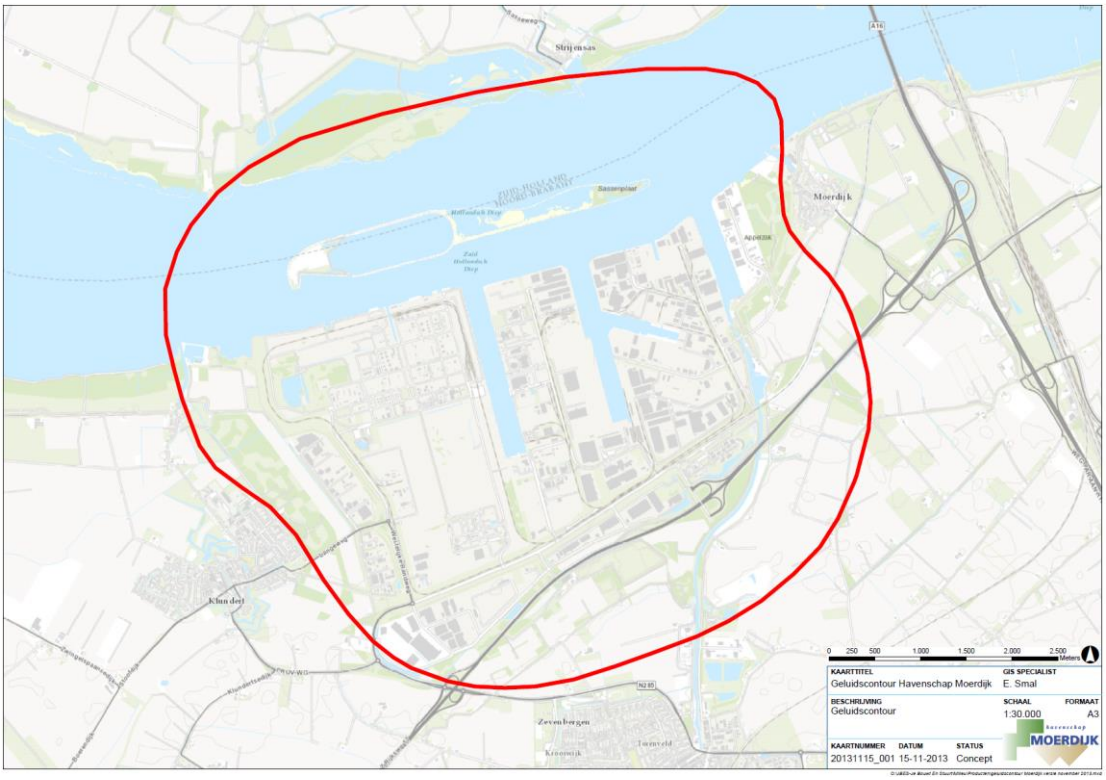

Figure 8: Noise zoning around the Moerdijk Port and Industrial Estate

7.2 Projects and opportunities

Current activities at the Moerdijk Port and Industrial Estate fit within the established noise zone. All noise allowance has been assigned to the already existing companies. This may impede the expansion of business activities. To create more noise allowance in the future, a study into tradeable noise emission rights has been initiated at the Moerdijk Port and Industrial Estate.

For each company within the Moerdijk Port and Industrial Estate, the maximum allowed noise emission has been established. In practice, however, the established noise allowance is not fully utilised by the companies. The actual noise emissions for the total area certainly leave room for new activities. The problem is that companies with unused noise allowance often do not easily part with it, out of the fear to be confronted with limitations when they themselves wish to expand or modify their business operations. By applying a system of tradeable noise emission rights, value is assigned to the noise allowance.

This makes it more alluring to companies to part with unused noise allowance or to invest in noise reduction measures.

The Moerdijk Port Authority has initiated a project in order to examine whether a system of tradeable noise emission rights is feasible. Together with the Port of Amsterdam, it has been awarded a grant in the context of the 'Seaport Innovation Project for Sustainability ('Zeehaven Innovatieproject, ZIP). The objective of this project is to design a clear and accessible system of tradeable noise emission rights. The final report of phase 1 of the study, the inventory of tradeable noise emission rights, was drawn up in June 2013. As a result of this study, a good overview of the current and expected noise levels at the Moerdijk Port and Industrial Estate is now available. The study shows that it is possible to successfully introduce a system of tradeable noise emission rights and that companies are positive, even if critical, towards such a system. Further research is needed to determine how to embed the trading system in current legislation and how to legally shape it.

8. NUISANCE

8.1 Data and interpretation

If residents or businesses are experiencing nuisance caused by a certain activity or company, they may lodge a complaint. In 2012, the complaints originating from the Municipality of Moerdijk were registered centrally by the Regional Environmental Services West Brabant ('Regionale Milieudienst West-Brabant', RMD)[4]. As soon as a complaint is lodged, or a report made, it is immediately (24 hours a day, 7 days a week) forwarded to the duty officer of the RMD who will generally immediately contact the notifier/victim of the nuisance by telephone. On one hand to verify whether the nuisance is still occurring; on the other hand to collect further information which is required for the investigation to be carried out. He then investigates the cause of the nuisance and removes it (immediately) if possible. Afterwards, the results of the investigation are reported to the notifier.

At the location of the perpetrator, the cause of the nuisance is removed immediately if possible. If this is not possible, a subsequent course of action is initiated in consultation with the Municipality of Moerdijk or the Province of North Brabant. The regular supervisor of the perpetrating company will take over this subsequent course of action.

Table 5 shows the number of complaints for the years 2008 to 2012. This also includes complaints that were lodged by residents from outside the Municipality of Moerdijk (such as Hoekse Waard, Strijen/Strijensas). Figure 11 shows a breakdown by category of the complaints.

Table 5: summary of complaints 2008-2012

Complaints	2008	2009	2010	2011	2012
Total	279	307	244	385	466

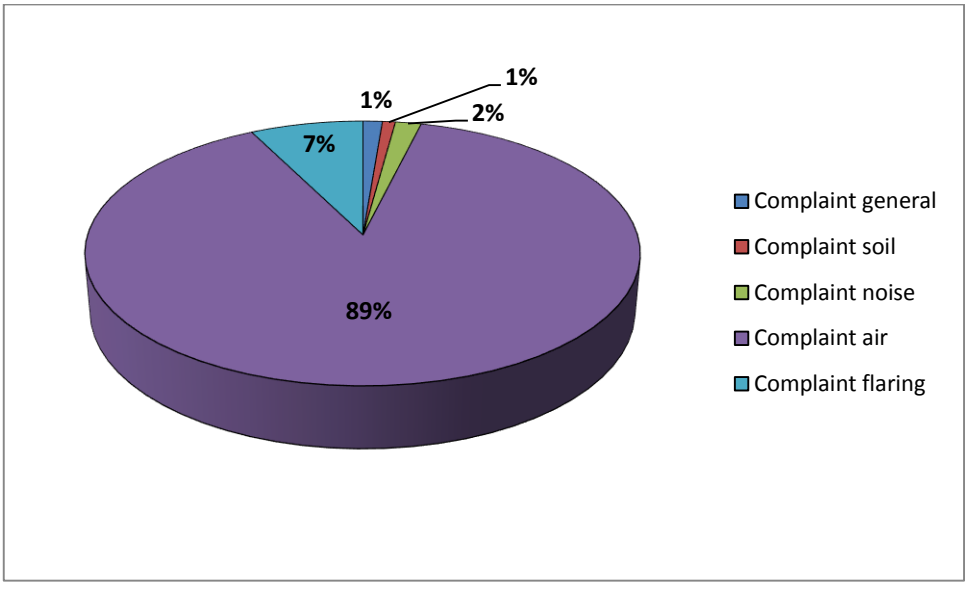

Figure 9: Breakdown by category of complaints regarding the Moerdijk Port and Industrial Estate in 2012

[4] From 1 January 2013, the complaints are registered by the Environment Agency for Central and West Brabant ('Omgevingsdienst Midden- en West-Brabant', OMWB), in which the RMD was incorporated.

In 2012, 466 complaints were lodged whereby the complainant indicated that the nuisance was probably caused by companies within the Moerdijk Port and Industrial Estate.
Just as in previous years, most complaints (89%) were related to air. Air-related complaints generally concern odour nuisance. In case of approximately 40% of the complaints, a cause or perpetrator can actually be determined upon investigation. This so-called solution percentage is slightly higher than that of other, comparable environmental services (30 to 35%). In 2012, the solution percentage for the Moerdijk Port and Industrial Estate was 57% (267 out of 466). In case of 199 complaints, the actual perpetrator could not be determined. From the description of the complaint and the information provided by the complainant, the RMD concluded that the cause of the complaints could be attributed to the industrial estate.

More complaints were lodged in 2012 than in 2011. The reason for this increase is not fully clear: perhaps people have become less hesitant about reporting nuisances. There have been several surges in the number of complaints. Also, complaints have been lodged against companies that rarely (or never) cause nuisance at other times. 14 complaints have been attributed to degassing by shipping vessels.

76 (16 %) of the 466 complaints also included health complaints.
The health complaints concern:

- respiratory complaints (12 complaints);
- nausea/gastrointestinal complaints (21 complaints);
- irritation to eyes and/or mucous membranes (5 complaints);
- headaches (13 complaints);
- anxiety/fear (10 complaints);
- insomnia (2 complaints);
- miscellaneous (13 complaints).

8.2 Projects and opportunities

In response to the outcome of the various complaint investigations, different course of actions have been set in motion in 2012 to reduce the nuisance. For example, additional investigations of the causes of complaints have taken place at perpetrating companies. They took technical or organisational measures where necessary. The competent authorities use the outcome of complaint investigation as additional input for the implementation of regular and additional checks. In a number of cases, the regulations attached to the license of the perpetrating companies have been modified by the competent authorities.

Project e-noses
Following the fire at Chemiepack, additional measuring points have been placed around the site of Chemiepack to determine the presence of harmful substances in the air. Although these measuring points clearly indicated heightened concentrations of benzene in the air, the source of these concentrations could not be established. Residents in the vicinity of the port and industrial estate regularly report odours, but the source of these odours is difficult to trace. This has led to 7 parties joining forces, namely:

- Province of North Brabant;
- Municipality of Moerdijk;
- the Municipality of Strijen;

- Moerdijk Port;
- The Directorate-General for Public Works and Water Management;
- ATM;
- Shell.

They initiated a pilot project with so-called 'electronic noses'. In total, 25 'electronic noses' were placed at strategic locations in the area. These e-noses can immediately detect changes in air quality. If these changes concern harmful substances, alarm levels may be raised (early warning) on the basis of this information. The e-noses are also able to identify odours that are specific to a certain company, the so-called 'fingerprints'. Although the e-nose network does not provide absolute values, this does make it possible to trace the source of benzene concentrations, for example.

The pilot project receives substantive support from Common-Invent, the supplier of the e-noses. In addition, a lot of consultation takes place with DCRM Environmental Services Rijnmond and the engineering firm Witteveen & Bos with respect to a similar project that is being performed in the Port of Rotterdam. In this way, knowledge and experience can be pooled.

The nuisance related to benzene is probably caused by degassing vessels. This problem is being addressed at managerial level.
Consultation is also taking place with the Directorate-General for Public Works and Water Management about the way in which to deal with complaints about degassing ships.

Brainstorming group complaints
In recent years, the Environmental Complaints study group has worked hard to register and follow up on complaints in a uniform manner. Because this process was completed, the activities related to complaints were transferred to the Moerdijk enforcement team that is part of the Environment Agency for Central and West Brabant. In order to gain insight into, and to advise on, the nature, extent and quality of the environmental complaints, the DVM steering committee decided in June 2013 that it would be advisable to create a brainstorming group for environmental complaints, in which all different interests (corporate interests, residents' interests, government interest, health interests and environmental interests) are represented.