



# Dealing with flood risk as a Seveso III company

Services and solutions for proactive flood risk management

## New regulations

The 1976 industrial dioxin cloud disaster in Seveso, Italy, prompted industrial companies across Europe to take a closer look at their industrial safety measures and furthermore to prevent major industrial accidents involving dangerous substances from posing a threat to the environment. The SEVESO Directive is a European initiative to adopt legislation on the prevention, preparedness and response to such accidents.

The SEVESO III Directive, which has been in force since June 2015, introduces the need to assess the effects caused by external factors and natural hazards. In most cases in The Netherlands, this policy will also encourage SEVESO III companies to assess their vulnerability to flooding.

## Striving for a safer environment

Flooding is a hazard that needs to be considered particularly by industries. In fact, the chance of flooding is often much larger than any other industrial hazard, such as the probability of loss of containment. Of all the natural hazard events registered between 1970 and 2012, storms and flooding accounted for 55% of lives lost and 86%

of economic losses incurred (WMO, 2014). Worldwide, an increase in overall and insured losses due to natural catastrophes is detected (Swiss RE, 2015). As a result we now observe an increase in the potential effect of flooding on industry.

At Royal HaskoningDHV, we take a pro-active approach to these developments by working with our industrial clients in partnership to help create safer environments. We believe every industrial company in a flood-prone region should have a thorough flood risk assessment conducted, and have a set of customised solutions if the identified flood risk is considered significant. These solutions focus on protection (e.g. flood walls) and emergency response (e.g. flood emergency response plan).

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Facilities with well-organized Flood Emergency Response Plans suffer **70% less damage**, and **resume operations faster** than those without a plan (Source: FM Global, 2003)

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## Integrated industrial and flood expertise

There are numerous tools available for companies to assess their exposure to potential flood hazard such as the Dutch website, [www.risicokaart.nl](http://www.risicokaart.nl). Royal HaskoningDHV has been responsible for a large part of all flood mapping analyses on which the website is based.

Even with access to such information, in practical terms, it remains a challenge to make a sound judgement of the potential hazard without access to detailed information or flood experts to interpret the results.

At Royal HaskoningDHV we have extensive experience in conducting these assessments. Our experience has also shown that we provide the best possible solutions for our clients by working in teams that combine industrial safety and flood safety expertise.

We have taken this expertise and experience to work together with several oil terminals and large multinationals including Unilever, FrieslandCampina, Heineken, Coca-Cola and Nestlé-Perrier on the topic of flooding. We have also recently been assigned a project by the Port of Rotterdam, the City of Rotterdam and Rijkswaterstaat to develop an adaptation strategy regarding flood safety for the Botlek area of Rotterdam in The Netherlands. Several SEVESO companies are located in this industrial area.

## Our services

Every project we execute for our industrial clients is different and demands a unique mix of services. These include the following depending on the requirements or the situation faced:

- Site assessments (including inventory of critical equipment, infrastructure and risk locations)
- Flood awareness campaigns (e.g. guidelines, brochures, videos, seminars)
- Flood risk assessments (e.g. flood hazard modelling, flood impact modelling and cost-benefit analysis)
- Sewerage-, storm- and wastewater management planning
- Design of flood risk reduction measures (e.g. hydraulic, structural and geotechnical engineering)
- Development of flood emergency response plans
- Training and dissemination of company staff
- Construction management and supervision

Royal HaskoningDHV is an independent, international engineering consultancy providing services for the entire living environment. Our work contributes to the sustainable development of the communities we work in all over the world. We believe meaningful solutions cannot be created without collaboration with our partners, clients and other stakeholders. We enhance society together.

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