

Water Permit Sitech Use of toxicology data

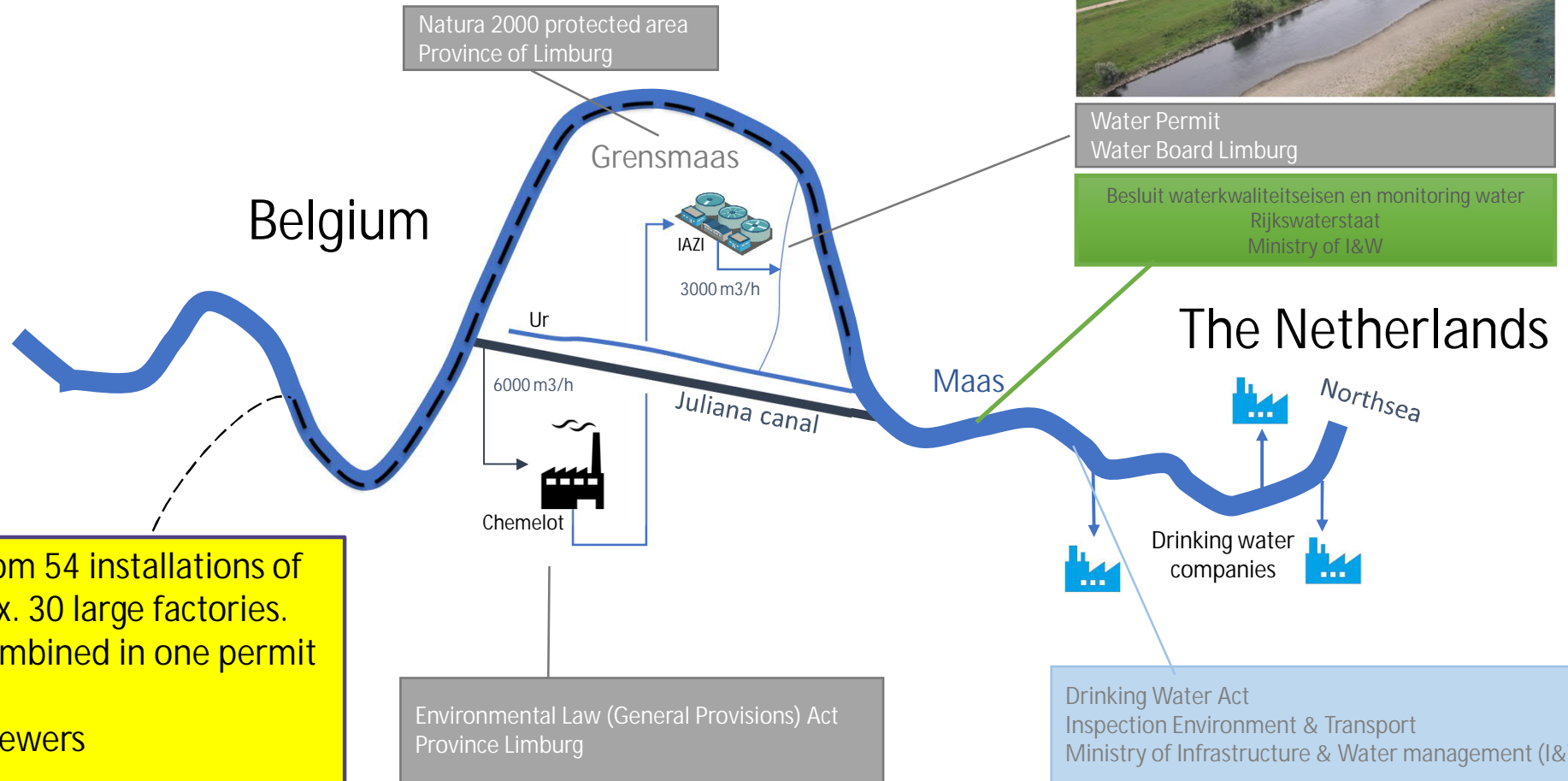
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Unique context Wastewater Treatment Chemelot



Water Permit
Water Board Limburg

Besluit waterkwaliteitseisen en monitoring water
Rijkswaterstaat
Ministry of I&W



Discharge from 54 installations of which approx. 30 large factories. These are combined in one permit

Ca. 290 km sewers

Buffercapacity: 140.000 m³

analyze • optimize • maximize •



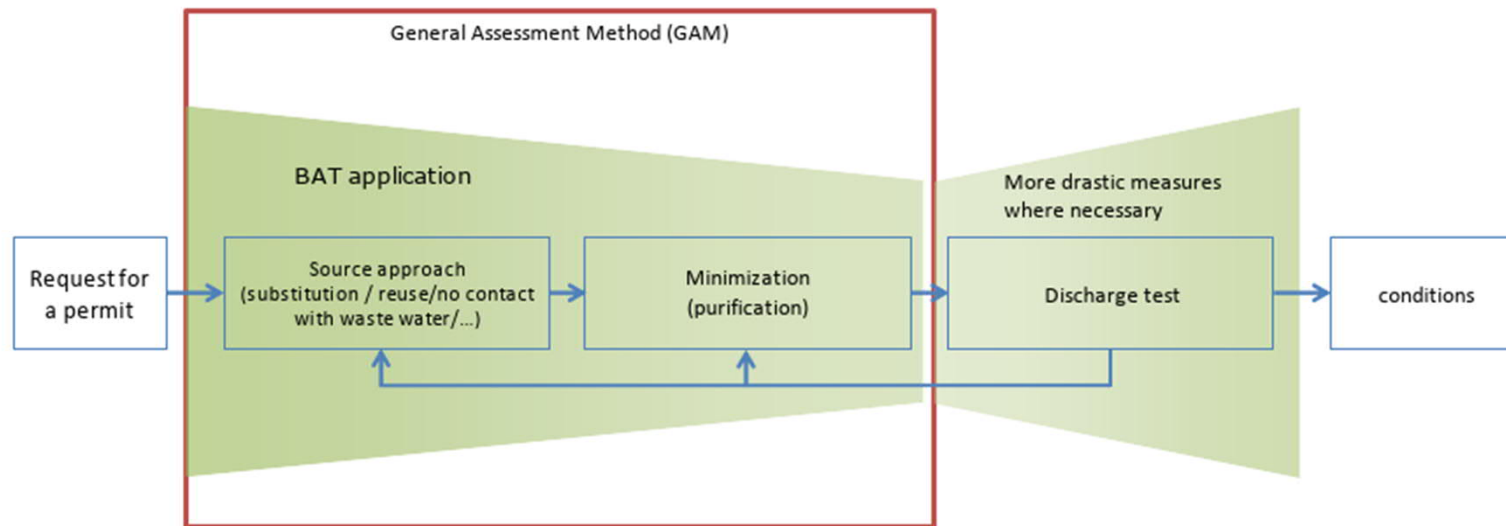
Situation

- As a Chemical site, the processes release (by)products and waste materials, which are partly discharged to the wastewater treatment plant (IAZI), after which the purified stream is discharged into the Grensmaas. This stream still contains (waste) substances
- In the application process of the water permit, a collaboration has been set up with stakeholders; Water Board Limburg, Rijkswaterstaat, WML, Dunea, Evides, Province of Limburg and Sitech
- The main aspect to obtain a water permit is to comply on the Discharge test (immissietoets) for ecology and drinking water for all individual substances that can enter the wastewater, in order to control the discharge and reduce it where necessary. The issue of emerging substances is important.

Changes in water permit

- Previous water permit 2016-2019 with temporary extension 2020
 - Permit on sum parameters, some salts, some metals, flow rate and some individual substances
- The current water permit 2020-2027
 - An essential difference is that (by)products and product mixtures, which can possibly be discharged to the wastewater treatment plant, are split into the individual substances. Subsequently:
 - General Assessment Method (ABM2016) for all individual substances (no assessment of products)
 - Reduction discharge of SVHC, potential SVHC and A-substances (Plans of approach per individual plant)
 - Determining concentration per substance in the effluent WWTP by analysis or calculation
 - Discharge test (immissietoets) performed per substance; no lower limits
 - Monitoring effluent
- The result is a list of substances (approx. 630 substances) with GAM assessment and data, annual loads, removal efficiencies, effluent concentrations, results discharge test
- All changes in discharge have to be done via a change of the permit (lead time 6 months after submission)

Discharge Permit – step by step



BAT = Best Available Techniques (reference documents common Waste Water and Waste Gas treatment)

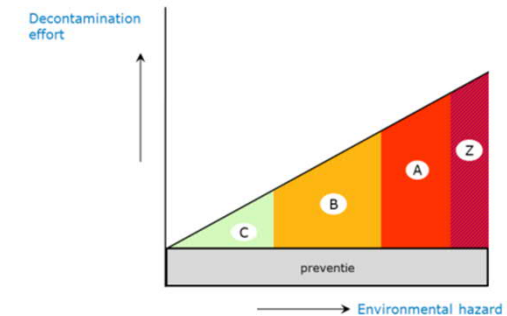
General assessment methodology of substances 2016

- Input

- Biological degradation
- Ecotoxicological data → acute and chronic on three levels (fish, invertebrates; algae)
- Chemical and physical properties → water solubility and log Kow

- Output

- Z (Substances of Very High Concern);
- A (not readily biodegradable aquatic harmful substances);
- B (readily biodegradable aquatic harmful substances);
- C (substances that occur naturally in local surface water)



- Category determines the effort necessary for reduction in discharge

Discharge test

- Assessment discharge of substance into surface water
- Input
 - Concentration of single substance in discharged water stream (no threshold value)
 - Dilution factors - mixing zone (maximum dilution for IAZI = 22)
 - Background concentrations in surface water
 - Environmental Quality Standards (AA-EQS, MAC-EQS)
 - Drinking Water Quality Standards (if no substance standard available: use of general standard of 1 ug/l)
- Output: If discharge test criteria are met, then discharge is admissible

AA = annual arithmetic mean concentration

MAC = maximum acceptable concentration

Getting data

- MSDS: not enough information; composition → need for NDA with suppliers; substance data very limited or not available
- ECHA: main data source; accepted by government; lot of substances but also limited data (polymers are exempt from registration and evaluation under REACH)
- ECOTOX: useful data source
- QSAR: limitations for UVCB substances and polymers
- Literature: useful but difficult to find

- If no toxicological standards available Sitech needs to make them available:
 - Deriving (indicative) ecological standards (additional data generation from tests)
 - Deriving (indicative) drinking water target values

Eco standards derived by Sitech, now also drinking water standards; assessment and approval via scientific advisory board on standards for water and air (WKnl) → time consuming process

Nature Conservation Act permit

- Whole Effluent Assessment (WEA)
- Continuous Biomonitoring with Mussels

Summary on toxicology in relation to water permits

- Toxicology data necessary for GAM of substances
- Capacity of laboratories for testing (ecotoxicity) is limited
- Ecology standards and drinking water standards necessary for Discharge test
- Water Board Limburg demands Industry (Sitech) to derive standards and getting standards approved
- Deriving standards is work for experts
- Getting standards approved is time consuming (> 6 months)

- Hot Item: micro-plastics → toxicity ?