

Pollution of the river ENNS following a leakage from a hydrocarbon storage tank

31 May, 1998

Downstream from the City of STEYR Austria

- Accidental pollution
- Storage tank
- Domestic fuel
- Double envelop
- Testing
- Drainage
- Welding

THE INSTALLATIONS IN QUESTION

The installation in question is a high-capacity storage tank, located on the site of an engine manufacturing company. It contains diesel oil (domestic fuel) used for the heating system.

This tank consists of two envelopes as shown in the diagram below. The reservoir containing the product, made of steel, is housed inside another reservoir. The assembly measures approximately 22m tall and can contain approximately 1,000 m³.

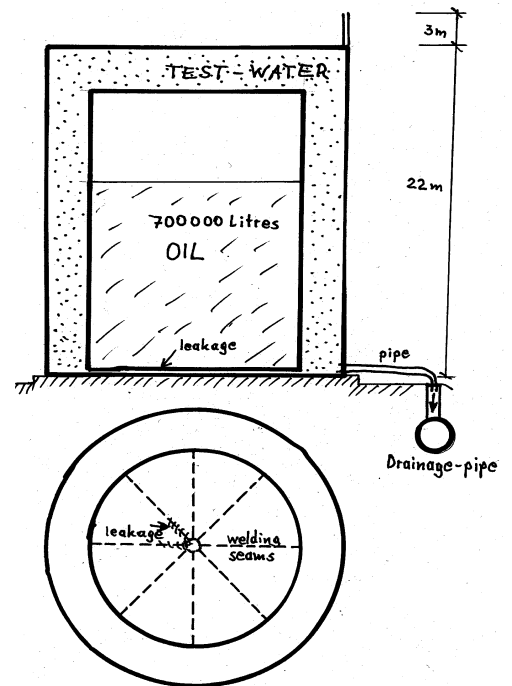
The site concerned is located on the bank of the river ENNS, a tributary of the DANUBE, and downstream from the City of STEYR. The STANING hydroelectric plant's impounding dam is also located downstream. Furthermore, within this same zone on the left bank of the river, there is a drinking water station with its extraction wells in its immediate vicinity which provides water to approximately 50,000 inhabitants.

THE ACCIDENT, ITS BEHAVIOUR, ITS EFFECTS AND CONSEQUENCES

The accident

The tank is undergoing testing: the space between the two walls is thus filled with water. At this time, the "interior" tank containing the fuel contains approximately 700 m³. During the entire test, the tanks appear to be free of anomaly.

During the night, the valve at the base of the tank is opened and the test water drains toward the river via the inter-envelop drainage pipe.



Tank structure

Photo DR

The consequences

In the morning, fishermen inform the police that the river is polluted. The majority of the pollution is located within the impounding lake formed by the STANING dam, thus near the drinking water well zone.

For three days and three nights, the water authorities and fire brigade worked to contain the pollution: installation of floating barriers, skimming of the surface to recover the hydrocarbons, cleaning of the surface and banks of the river, ...).

The pollution extended 35 km, affecting 3 hydroelectric dams located within this zone.

Approximately 9 weeks after the accident, the drinking water wells showed a significant level of hydrocarbon pollution. It was, however, of short duration and low concentration.

Finally, numerous wells were inspected during the 6 months following the accident.

Map showing the extent of the pollution caused by the accident

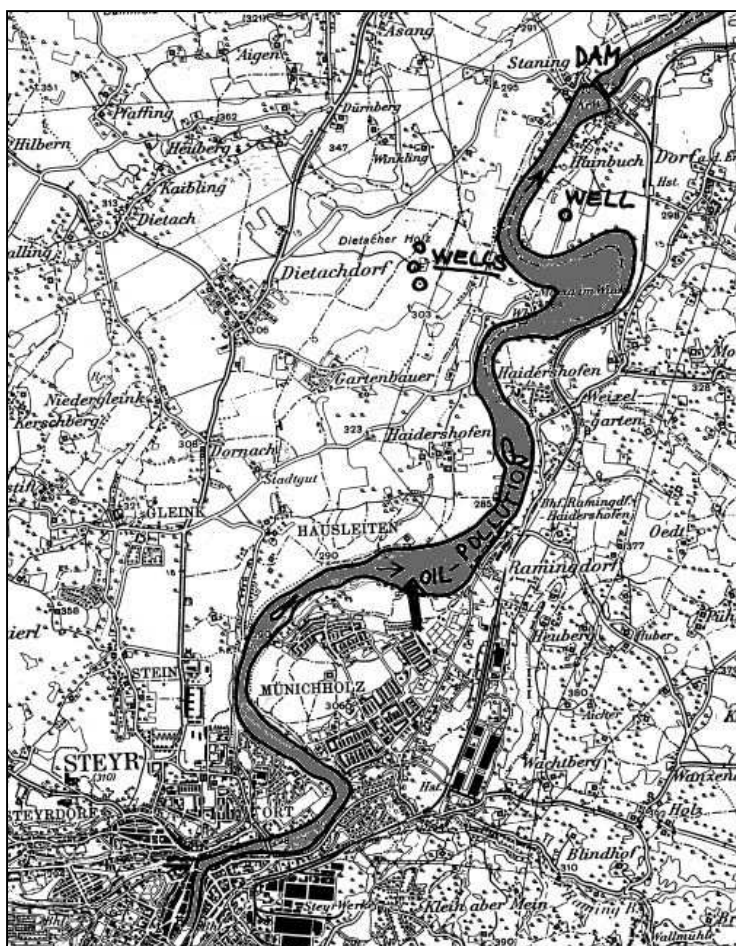






Photo DR

European scale of industrial accidents

By applying the rating rules of the 18 parameters of the scale made official in February 1994 by the Committee of Competent Authorities of the Member States which oversees the application of the 'SEVESO' directive, the accident can be characterised by the following 4 indices, based on the information available.

Dangerous materials released		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Human and social consequences		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental consequences		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic consequences		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The parameters that comprise these indices and the corresponding rating method are available at the following address: <http://www.aria.ecologie.gouv.fr>.

The level 2 of the index concerning the quantity of dangerous materials released (in the meaning of the SEVESO Directive) expresses the 70 m³ of domestic fuel that leaked from the tank (parameter Q1).

The level 4 given to the environmental consequences qualifies the 35 km of banks and river that have been contaminated by the pollution and needing cleaning operations (parameter Env 14).

As the economic consequences of the accident are unknown, this level could not be evaluated.

Identically, the information available about consequences on the drinking water catchment does not enable to estimate the level related to human and social consequences

ORIGIN, CAUSES AND CIRCUMSTANCES OF THE ACCIDENT

During the test, no one was able to detect the crack on a section of weld seams located on the bottom of the main tank, i.e. the tank containing the hydrocarbons. As a result, approximately 70m³ or more drained into the river by way of the water drainage valve.

LESSONS LEARNT

The tank in question is of special conception. However, certain lessons should be learned from this type of situation:

- ✓ The drainage phenomenon was amplified by the test of the exterior tank as the leakage of hydrocarbons is assisted by the draining water;
- ✓ Drainage operation should be done during the day so that a possible accident should be prevented or controlled by the on site personnel;
- ✓ The installation configuration, with a purge emptying directly to the river, is inadequate.