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Report 01.372

30 May 2001

File: X/13/11/1

[Report 2001.Env 01.372.RG:sw]

Report to Environment Committee
from Rosalind Groves, Hazard Analyst

Natural Hazards Risks Associated with Storage and Transport of Non-Petroleum Hazardous Substances, Wellington Region

1. Purpose

To report the findings of a scoping study identifying the risks associated with the storage and transportation of non-petroleum hazardous substances due to natural hazards in the Wellington Region.

2. Background

The Wellington Region has a high risk from natural hazards, particularly earthquakes. There are also significant hazards from flooding, storms and wild fire. While there have been no major recent incidents associated with hazardous substance storage or transport in the Region, there are potential risks to people as well as built and natural environments. The Regional Council aims to investigate human-induced or technological hazards and identify measures to manage associated risks.

Studies were completed during 1998-2000 on the hazards associated with the transport and storage of petroleum products in the Wellington Region. In 2000/2001, the Regional Council commissioned a scoping study into the risks associated with the storage and transportation of hazardous substances from natural hazards in the Region. This study includes substances covered in the Hazardous Substances and New Organisms Act 1996 (HSNO Act), but excludes petroleum, pesticide and biological substances.

The objectives of this study were to:

- Identify the nature and distribution of hazardous substances stored in the Region;
- Assess the hazard associated with the storage facilities due to natural hazard events;

- Consider the hazard arising from transportation of these products; and
- Estimate the consequential risk to the community and the environment.

The non-petroleum hazardous substances study is identified in the Resource Policy Department's 2000/2001 Operating Plan. It relates to Natural Hazards Method 10, and Waste Management and Hazardous Substance Methods 16, 17(3), and 19(2) of the Regional Policy Statement.

Opus International Consultants were commissioned to undertake the study. A copy of their draft report will be tabled at the Committee meeting.

3. **What are Hazardous Substances?**

Under HSNO Act, a hazardous substance is any substance that exceeds a defined level of one or more of the following properties:

- An explosive nature (including both substances and articles and pyrotechnics such as fireworks);
- Flammability;
- Ability to oxidise (that is, to accelerate a fire);
- Corrosiveness;
- Acute or chronic toxicity;
- Ecotoxicity, with or without bioaccumulation (that is, it can kill living things either directly or by building up in the environment); and
- Can generate a hazardous substance on contact with air or water.

4. **Hazards Associated with Hazardous Substances**

Hazardous substances may cause long-term effects on human health and the environment (such as heavy metals and organochlorine compounds that accumulate in the food chain), or short-term effects (such as from volatile, explosive or flammable substances which rapidly evaporate, or from toxic materials that rapidly break down). The problems will differ from site to site, both in nature and in degree of risk.

An event associated with hazardous substance storage or transport and natural hazards has the potential to have a high impact, possibly even death. Recent incidents involving hazardous substances in New Zealand include:

- Kerosene-solvent tanker crash at Whenuakura, near Patea, on 23 January 2001, where 21,000 litres of solvent escaped and about 500 litres flowed into the Whenuakura River;
- Ongoing issues regarding dioxin from herbicide manufacture and disposal in New Plymouth;
- An effluent spill from meat processors in Ashburton on 1 February 2001, contaminating a water race;
- Caustic soda leak at the Marsden Point oil refinery in Northland on 19 May 2001, which sparked a major emergency response and affected 35 workers; and
- Truck and double trailer crash on State Highway 1 south of Kaikoura on 23 May 2001, where 18 tonnes of rat poison and paint were tipped into the sea.

Natural hazards events relating to hazardous substances can lead to similar or larger incidents.

5. **Risks Associated with Hazardous Substances in the Wellington Region**

The dominant natural hazards in the Wellington Region affecting hazardous substances storage are large earthquakes. The impact of an event is likely to depend on the nature of the substance, and the standard of containment. The availability of staff and materials to contain the spill is likely to be a problem after a large earthquake, when emergency resources will be stretched.

The greatest potential hazard in the Wellington Region is from chlorine and explosives. Chlorine is used in industry and water/wastewater and swimming pool treatment and explosives are used in quarries and for military use. Most of these sites are relatively isolated and thus likely to be associated with relatively low risks, as they are generally away from populated and built-up areas. However, chlorine storage sites within industrial areas, particularly Seaview, pose a higher risk as a result of the nearby populated areas and proximity to the coastal marine area. Where gaseous chlorine is used for swimming pools in populated areas, there is likely to be a high risk if the standard of containment makes it vulnerable to natural hazards.

Solvents and caustic soda used in industry also have a potentially high hazard, but a lower risk than from chlorine. This may be explained by liquid solvents being more easily contained in a spillage event and their spill having less impact on people than gaseous chlorine. However, the spread and effect of the spillage depends on the nature of the substance and weather conditions at the time of spillage.

The highest risk during transportation is likely to be from chlorine gas being carried in large quantities, as a spill during transportation will be unable to be contained. The risk from explosives and flammable liquids (such as solvents) will be high for those in the immediate vicinity of any incident, but the consequences are likely to be limited to the locality of the incident.

6. **Risk Management**

A number of suggestions are made to minimise the risks associated with hazardous substances. Key areas are improved storage, creation of buffer zones, identification of lower risk transport routes, and enhanced incidence response planning.

7. **Study Recommendations**

The study recommends that:

- Additional data are collected in an integrated manner, to enhance those presently required by the Dangerous Goods Act;
- Co-ordination issues are discussed with territorial authorities and emergency services, including our capacity to deal with incidents involving a variety of substances;

- Risks are taken into consideration in the issue of land use consents and district planning (e.g. hazardous substance storage facilities on floodplains); and
- We undertake a detailed study of how management of the risks arising from hazardous substances could be improved.

8. **Where to from here?**

The findings will be presented to the emergency management, planning and consent officers, the emergency services and lifeline utility organisations to gain their feedback and help determine the course of further action.

The issue of potential contamination spread or run-off during incident events will be discussed with relevant Regional Council officers.

9. **Communication**

The study will be communicated to others through:

- Presentations and follow up discussions with relevant staff and organisations; and
- Distribution of written reports and digital information to territorial authorities and a summary fact sheet to other organisations.

10. **Recommendation**

That the report be received and its contents noted.

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