Protected by Regulations?

The Hazardous Substances and New Organisms (HSNO) Act

Purpose: To protect the environment, and the health and safety of communities, by preventing or managing the adverse effects of hazardous substances and new organisms.

http://www.osh.govt.nz/law/hsno.shtml

The HSNO Act

"Requires any hazardous substance manufactured or imported into New Zealand to have an approval from EPA (ERMA) New Zealand.

Chemicals that are being used in seismic surveys and for hydraulic fracturing will be subject to HSNO regulations, provided that they are hazardous substances.

But there is no requirement for EPA (ERMA) NZ to be notified when the substance is being used." EPA

Regulation / Self-regulation?

Two methods of HSNO approval:

1. Part 5 approval - application must be made to EPA
   EPA has not processed a Part 5 application for a substance where fracking was the sole proposed (or possible) use .
2. Group standard approval - a 'blanket' approval for a group of substances (mixtures)
   It is up to the importer to determine if the substance is approved via a group standard. The relevant group standard is the 'Additives, process chemicals and raw materials group standards'.
   http://www.epa.govt.nz/hazardous-substances/approvals/Pages/default.aspx

Who has the information?

"The Department of Labour's role is to ensure that the HSNO Act is complied with in places of work." http://www.osh.govt.nz/law/hsno.shtml

"Any sites that have quantities of chemicals reaching trigger levels under HSNO, will have test certificates issued … by an independent test certifier. This information will be held by the organisation concerned. MSDS are also held by the company and their chemical supplier, not by the DOL office" DoL

Enforcement 'As required'?

"Duty holders are obliged to provide DoL Inspectors with information when they undertake their regulatory activities.

This is done on an 'as required' basis to allow determinations of compliance on a case by case basis." DoL

What's our Councils' role?

What Chemicals?

Of 46 "fracturing products", 38 are hazardous (i.e. explosive, flammable, acutely toxic, carcinogenic, mutagenic and/or ecotoxic).

More than ten products had undisclosed components; stated as proprietary, trade secret or simply not listed.

Based on information from TRC Hydrogeologic Risk Assessment of Hydraulic Fracturing for Gas Recovery in the Taranaki Region, Appendix 1 (Feb 2012) http://www.trc.govt.nz/assets/Publications/guidelines-procedures-and-publications/Fresh-water-2/fraccing-appendices-feb2012-w.pdf

Product: XLFC-1B (gelling agent)

Components: Diesel fuel No.2: 40-45%, Guar gum 40-45%

Hazards: Flammable, acute toxicity, skin corrosion. Toxic to most fish at 2-100 ppm. May cause long-term adverse effects in the aquatic environment.

Based on information from TRC Hydrogeologic Risk Assessment of Hydraulic Fracturing for Gas Recovery in the Taranaki Region, Appendix 1 (Feb 2012) http://www.trc.govt.nz/assets/Publications/guidelines-procedures-and-publications/Fresh-water-2/fraccing-appendices-feb2012-w.pdf

Product: NE-110W (non-emulsifier)

Components: Aromatic hydrocarbon mixture, Naphthalene sulfonic acid bis(1-methylethyl) compound with cyclohexanamine, Methyl isobutyle carbinol and Isopropanol (all % Proprietary), Naphthalene % <7, Sulfuric acid % <3

Hazards: Methyl isobutyle carbinol is flammable, acutely toxic, harmful to aquatic environment and terrestrial vertebrates. Naphthalene is all of the above and is more ecotoxic, also a suspected carcinogen. Sulphuric acid is acutely toxic at <3%.

Note: Some components not in NZ inventory and most of unknown % (proprietary).

Product: X-CIDE 102 (biocide)

Components: Glutaraldehyde (111-30-8) 10-25%, Water

Hazards: Acute toxicity, corrosive, Specific Target Organ Systemic Toxicity. Toxic to fish, birds and bacteria. May evolve toxic gases when heated to decomposition. Dangerous at concentrations near or below chemical detection limits.

Disposal: If released to soil, may metabolise and is expected to leach to groundwater.

Product: Halliburton SSO-21 (foaming agent)

Components: Oxyalkylated alkyl phenol (CAS # not provided) 30-60%, Ethylene glycol monobutyl ether (111-76-2) 10-30%, Methanol (67-56-1) 10-30%, Diethylene glycol (111-46-6) 1-5%

Hazards: Hazard alert code: High, Carcinogen, acute toxicity, reproductive toxicity, ecotoxic to aquatic environment and terrestrial vertebrates. Dangerous at concentrations near or below chemical detection limits.

Product: Halliburton BE-3 Bactericide

(DBNPA containing biocide)

Components: Propylene glycol >60%

2,2-dibromo-3-nitrilopropionamide 11-30% (DBNPA).

Hazards: Acute toxicity, reproductive toxicity, Specific Target Organ Systemic Toxicity, very toxic to aquatic organisms (long-term adverse effects). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Dangerous at concentrations near or below chemical detection limits.

Product: Halliburton WAC-12L Additive

Components: Ethyl benzene 1-5%, Xylene 10-30%,

1,2,4 Trimethylbenzene 10-30%,

Light aromatic solvent (petroleum) 30-60%.

Hazards: Carcinogenic, acute toxicity, reproductive toxicity, target organ (liver and kidney) systemic toxicity. Ecotoxic to terrestrial vertebrate. Toxic to aquatic organisms (acute and chronic). Prevent from entering sewers, waterways, or low areas.

How much chemicals?

Site: Tag Oil Cheal wellsite (2010)

Total volume of fracture fluid:

A7 well: 77.2 cubic metres

B3 well: 183 cubic metres

BH1 well: 511 cubic metres, five fracture stages.

Chemicals: 0.85 % of the fracture fluid in each fracture , containing XLFC-1B, X-CIDE 162, Wax-Chek 5222,US-4D, sodium bicarbonate, Saraline 185V, PSA-2L, PSA-1, GW-3, GBW-12CD, Clay Master-5C, and BF-7L

Total Chemicals: 24 cubic metres (just 3 wells)

Total Contaminated Fluid: 771 cubic metres – "Volume of return fluids for each well was difficult to determine"

www.trc.govt.nz/assets/Publications/guidelines-procedures-and-publications/hydraulic-fracturing/hf-may2012-main.pdf

Fracked with Diesel?

Site: Swift Energy (Origin) Manutahi well site (2005)

Total volume of fracture fluid:

Manutahi A1: 56 cubic metres (fracked at 1157-1179 m depth)

Manutahi B1: 74 cubic metres (1160 - 1175 m)

Chemicals: Fracture fluids for both wells comprised 99 % diesel and 1 % additives (GO-64, XLO-5, NE-110W, GBO-9L, SuperSetP)

Volume of produced back fluids: 56 and 74 cubic metres.

"Fracture fluids were reused or produced back through the processing plant during production testing."

Note: "Distance from the top of the fraccing fissures in the reservoir to the freshwater/saltwater interface is about 257 m"

www.trc.govt.nz/assets/Publications/guidelines-procedures-and-publications/hydraulic-fracturing/hf-may2012-main.pdf

Just how much are we being told?

TRC HF report Appendix 1 contains Material Safety Data Sheets (MSDS) of fracturing products supplied by companies.

Nov 2011: 163 pages
Feb 2012: 282 pages (46 products)
May 2012: 429 pages (67 products)
http://www.trc.govt.nz/assets/Publications/guidelines-procedures-and-publications/hydraulic-fracturing/hf-may2012-append-w2.pdf

How many more fracturing products have actually been / are being / will be used in Taranaki?

What about the naturally occurring chemicals e.g. heavy metals, radioactive substances, BTEX … released by fracking?

http://www.youtube.com/watch?v=gz2mq5GYnR0&feature=player_embedded

Is Dilution the Solution?

"At least 3 of the chemicals are listed in the New York Risk Assessment list of chemicals 'dangerous at concentrations near or below chemical detection limits'... There are many other toxic chemicals included … 21 of the 23 most commonly used fracking chemicals in Australia had never been assessed by our national regulator." Dr. Mariann Lloyd-Smith, National Toxics Network

http://www.youtube.com/watch?v=gz2mq5GYnR0&feature=player_embedded