FLASHPOINT

NZ INSTITUTE OF HAZARDOUS SUBSTANCES MANAGEMENT

Winter 2017

Tower melts and burns

Inside: New hazardous substance regulations
New chief scientist
Sticky problem
Water - waste and otherwise
Titanium oxide

USEFUL ORGANISATIONAL CONTACTS

NZ Institute of Hazardous Substances Management
(formerly the Dangerous Goods Inspectors Institute)
www.nzihsm.org.nz
The official home of professionals committed to the safe management of hazardous substances and dangerous goods. The NZIHSM is a 'not for profit' industry association whose goal is to protect people, communities, and the environment against the adverse effect of hazardous substances, while maintaining the benefit of these.

Responsible Care NZ
Box 5557 Wellington 6145
Responsible Care NZ works with industry partners to implement the Hazardous Substances legislation.

Worksafe (MBIE)
www.worksafe.govt.nz
Government agency formed to povide compliance advice and enforcement of hazardous substances. Responsible for hazardous substances certificates.

EPA
www.epa.govt.nz
The EPA administers the HSNO Act and supplies extensive information on working with hazardous substances.

Ministry for the Environment
www.mfe
The Ministry provides policy, publications, technical reports and consultation documents on HSNO legislation.

Department of Building and Housing
www.dbh.govt.nz
The Government agency that maintains the Building Act and the Building Code.

Local Government NZ
www.lgnz.co.nz/lg-sector/maps/
Local Authorities have responsibility for policing building controls. Some local authorities are contracted to Department of Labour to provide enforcement of hazardous substances legislation. Often a first response point with valuable local knowledge.

Government legislation
www.legislation.govt.nz

If you know of other agencies which could be useful to members, please let us know at office@nzihsm.org.nz.

President's column

Don't forget the Science!

Hi all:
This is an interesting time to be involved in chemicals in New Zealand and in this *Flashpoint* a number of issues have been addressed.
We have:
• a new HSAW (Hazardous Substance) Regulations 2017;
• a new Chief Scientist at EPA;
• a fire where petroleum-based products are used for building cladding;
• an old product TiO2 being given new GHS classifications;
• using science for water and waste on our 'off-grid' house; and
• flashback to a 'sticky solution'.

Also 'Lest we forget' in this 100 year anniversary of World War I where chemicals were first used against other humans, or later when some of us forgot that a gassy coal mine could actually explode, that it is important to understand all of the process and that human laws should comply with 'nature's laws' to be truly effective.

It is wrong to assume that human legal laws can always match nature's laws and it is important to ensure that rather than just use laws 'as checklists' that some understanding of the actual natural process is important to correctly apply the law.

Or perhaps the start of the HSAW HS section 17.3 Stationary containers could be highlighted where it says: "Accepted engineering principles and practice to be applied".

Or to put it even more simply – "Don't forget the Science!!"

Hope that you like the read and let us all enjoy our world!

John Hickey
Institute president

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New HS regulations:

Following in Rutherford's footsteps?

After much debate and what seems like a long pause, the 'NEW' Health and Safety at Work Act: Hazardous Substance Regulations 2017 have been released some 18 months after the Health and Safety at Work regulations.

This may seem like a long time, but when one considers the initial HSNO regulations 1996 took 12 years to release after the chemical-changing ICI Fire of 1984, and the 549 pages, this is rapid indeed!

Describing 'Mother Nature' does take time to get anywhere near her simple, yet complex, nature, but it is pleasing to see that a lot of the regulation changes have been described by regulators as a 'lift and shift' rather than trying to rewrite Mother Nature, and for that consideration of the actual science, we can all be pleased!

The major changes?

Rather than trying to rewrite the whole 549 pages of the new hazsub regulations in a short article, please note they are available on www.legislation.govt.nz. Instead we identify some of the key points of the new regulations as follows:

The HSAW (Hazsub) regulations 2017

Key points

Much of the previous HSNO Class 1-5 (flammables) and 6, 8, 9 (toxic) regulations and related standards have been 'lifted and shifted' across, except that approved handler certificates will not be required for many Class 1-5 (flammable) substances.

Approved handlers are not required for most substances, but are being replaced with 'everyone will be trained'. (*This is a bold step, but without recognised certificates, how do you recognise adequate training?)*

Class 9 (environment) hazsubs are missing, but there is some coverage under 6 and 8.

The hazsub regs are organised into 20 parts and related schedules broadly around substance categories and administrative functions (*the structure is OK and should simplify multiple regulations, gazette notices and performance standards*).

The NO from HSNO (new organisms) is not obviously covered (*not many of these*).

A person-in-charge of business unit (PCBU), (replacing person-in-charge under HSNO Act), now means that nearly ALL involved with the handling of a hazardous substance have responsibility for that handling. (*This is good in that all involved are responsible and not just the 'person-in-charge', however this may also lead to some legal side-stepping as PIC can now* also try *and 'blame' other PCBU parties to reduce responsibility (we hope not, but it may take some case law to clarify*).

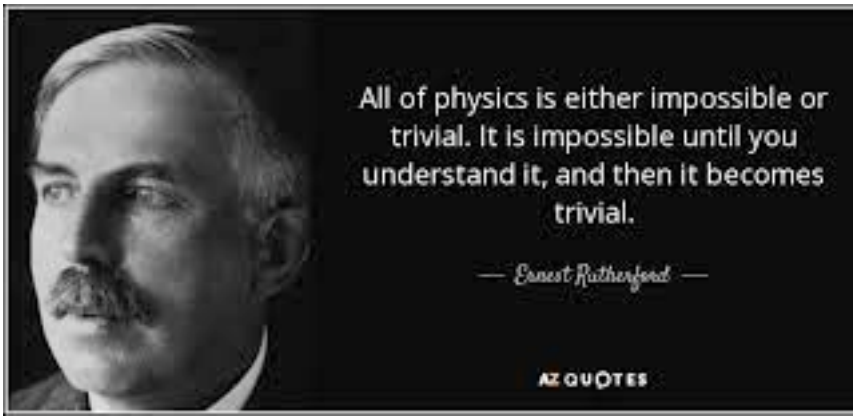
An inventory (or list) by PCBU of all hazardous substances on-site is now clearly required (*EXCELLENT!*).

The HSAW covers workplaces only so all other areas (eg: residential, public, etc) are not covered by HSAW and might not be checked in compliance certifier or general enforcement activity (*this may be a significant oversight, but time and case law will tell*).

We now have two pieces of legislation for chemicals or 'hazardous substances' namely the HSNO Act AND the HSAW (hazardous substance) regulations (*prefer One Act only, but then better than >10 prior to 1996 HSNO Act*).

Class 9 (environmental) hazardous substances are no longer to be considered by compliance certifiers or others under this workplace legislation (*WHOOPS!*).

(This would indicate that Class 9 (environmental) checking is no longer required under this legislation, but some highly toxic (6.1A-C, Class 8.1,2) substances will now need checking by compliance



certifiers and enforcement [*an information note to EPA responsibility for Class 9 secondary containment is in schedule 16]*. There have been some rumours that parts of the Resource Management Act and regulations are to be changed to exclude a significant amount of local council checking which may need care as the 'local authorities' are often the first point of call for advice on hazardous substance wastes and disposal).

For many hazardous (and oil-based) chemicals, the environmental trigger levels for bunding or secondary containment and other similar HS controls were significantly lower for the environmental effects than for personal safety under the HSNO regulations (eg: *Diesel fuel had HSNO Classes 3.1D, 6.1E, 6.3B, 6.7B, 9.1B where secondary containment was required for 3.1D at 10,000 litres but 9.1B at 1000 litres storage. This would imply that if 9.1B is not considered, the trigger quantity for diesel bunding compliance checking will increase to 10,000 l under HSAW (HS) from 1000 l under HSNO) This may be significant given that diesel spills contribute to some of the more noticeable incidents within NZ.*

(However, no doubt the courts will make decisions here after the first couple of tonnes of oil accidently drop into the harbours or water supplies.)

We are pleased to see 'for people and the environment' that some highly toxic (6.1A-C, Class 8.1,2) substances will now need checking by compliance certifiers and enforcement, which would indicate that some environmental considerations were observed during the HSAW HS regulation development.

The structure

There is an oft used saying: "when in doubt, read the instructions". Regulations are a bit like this in that "when in doubt, read the contents". In this case, the Table of Contents to describe the 20 parts and schedules along with a brief comment on each pat (section) is often the best way to try and describe 549 pages of regulations and we have also provided a more detailed article for those with specific interests to follow.

Verdict!

Overall this is QUITE GOOD LEGISLATION in that rather than reinvent the planet, regulators have generally been prudent and 'lifted and shifted' many of the useful regulations and more closely followed Rutherford's footsteps to 'match the science of Mother Nature'. This is better than, as some commentators have mentioned, 'throwing the baby out with the bathwater', which may have arrived from a holus-bolus adoption of our Australian cousins' occasionally flawed legislation that was initially suggested.

However, to balance this, it is a shame this legislation almost completely EXCLUDES the ENVIRONMENT (Class 9 substances) where New Zealand did actually lead the world from the 1996 HSNO regulations!

Yes, it may be prudent for us little guys to be slow followers rather than industry leaders, but then wouldn't it be even a little bit sad to say that "TENZING GOT THERE FIRST!!"

Asbestos restrictions stalled – again

The fight to impose tough trade restrictions on chrysotile asbestos will have to wait at least another two years.

For the sixth consecutive time, a handful of countries blocked the inclusion of the carcinogenic mineral from the Rotterdam Convention Hazardous Substances list (Annex III). Chemicals on the list are subject to restrictions that prevent the export of a product without the consent of the importing country.

Representatives from 157 countries met in Geneva, Switzerland, for the eighth Conference of the Parties (COP8) to the Rotterdam Convention. The biannual meeting drew to a close May 5.

Despite the vast majority of countries voting to include chrysotile — or white asbestos — to the list, there was not a unanimous backing by Rotterdam Treaty members, which is required to pass a vote.

Seven countries — Russia, Kazakhstan, Zimbabwe, India, Kyrgyzstan, Belarus and Syria — blocked the attempt to include chrysotile under the convention, overcoming the unified message of anti-asbestos advocacy groups around the world.

More than 100,000 people die each year from asbestos-related health conditions, including mesothelioma, a rare cancer that affects the lining of the lungs, abdominal cavity and heart.

Adding a substance to the list does not prohibit trade of that substance, but does require exporters to better inform purchasers about the hazards related to products containing the substance.

The science message –

Turn up the volume!

by Jacqueline Rowarth

In the rising tide of chemophobia globally, where celebrities have more followers than for instance, the bastions of science, the Royal Societies… the voices of reason are still there. The challenge is to turn up the volume so that we are heard.

Our role, working together, must be to raise the profile of the good work that we do in ensuring that 'hazardous substances' are managed appropriately and safely, while enabling health protection and the provision of affordable, high quality food.

This education and reassurance is part of my role at the Environmental Protection Authority. The new position of Chief Scientist has been created to enable improved understanding, not only of the management of hazardous substances, but also of scientific issues in general – for society and for the development of policy. More specifically, the Chief Scientist is to provide strategic leadership, operational advice, and guidance on science and science policy issues for the Chief Executive.

He, in turn, can advise ministers, and give them the confidence to make statements backed by facts.

Despite statements from those outside the health and agricultural industries, it will be extremely difficult to achieve the Millennium Sustainable Development Goals without chemicals.

Dr Martin Kayser, a medical doctor and senior vice president of Product Safety at BASF, was a keynote speaker at the Green and Sustainable Chemistry conference in Berlin in May. He stated that "the global chemistry industry has developed countless products that improve people's lives, by providing life-saving medical solutions, clean water, a healthy, more abundant food supply, cleaner and more efficient sources of energy and advanced building and construction material to design the cities of the future".

Innovation principle

He considers the chemical industry as a solutions provider, with a prerequisite for sound chemical management, and went on to suggest that we "need to think about replacing the Precautionary Principle with an Innovation Principle". His point was that the cost of registration, and the number of regulatory hurdles, is considerable and can be off-putting.

The European REACH agreement of 2006 is associated with a geometric increase in numbers of regulations governing the use of chemicals. With increased uncertainty, there appears to be a reluctance to invest in the rigorous research and development process that adds considerable costs to a company with no guarantee of returns.

Another keynote address was delivered by Dr Jarosinska, leader of the Environmental Exposures and Risks team at the World Health Organisation European Centre for Environment and Health in Bonn. She stated that "the growing evidence of human health effects of exposure to chemicals, especially at vulnerable life stages, confirms that sound management of chemicals is a health issue."

This is particularly the case in developing countries. Nearly a quarter of deaths are caused by 'modifiable environmental factors' that are not an issue in New Zealand. For instance, globally the biggest loss is due to air pollution, 1.3 million are suspected to be from chemical exposure, particularly lead, and 193,000 from unintentional poisoning.
One of the SDGs is to reduce the deaths and illness from hazardous

chemicals and air, water and soil contaminants substantially by 2030. Part of the process is 'solving problems by avoiding them'. Dr Jarosinska urged a 'benign by design' approach to new chemicals that considered the ethical and socio-economic impacts as well as the energy, resources and waste components of Life Cycle Analysis. These are the 'green and sustainable chemicals' of the future.

Scientists at the conference were clear that they are already trying to do the research required. Publisher Elsevier (the conference host) calculates that between 2008 and 2015, there was an 18% increase in publications using 'green chemistry' or 'sustainable chemistry' in their titles, abstracts or keywords. Over the same time period there was a 15% increase in the use of the phrase 'isolated from natural products', most of the increase being after 2011. Scientists and the industry are responding to what customers appear to want.

But as well as 'all natural', they want performance at reasonable cost. Industry has identified the overarching challenge: producing chemicals that will yield equal (or higher) performance at equal (or lower) cost while providing a positive environmental balance. It means increasing efficiency of resource use, increasing energy efficiency and decreasing human and environmental hazards.

Biggest challenge

But perhaps the biggest challenge is engaging the public. Concerns already exist that green chemistry, or whatever it is termed, will not be able to overcome pre-existing negative perceptions of chemistry.

The difficulty is that as science and technology become increasingly complex, in parallel with the increasingly complex issues of modern day global living, the potential for different interpretations in results or experiences increases. It is easier to understand somebody's story about how they have been or will be affected, than explain or take a position on the greater good.

This means that policy makers are facing challenges in reaching trade-offs between contrasting views and inputs. The Prime Minister's Chief Science Advisor, Professor Sir Peter Gluckman, states that 'science should have reached greater importance because it provides a relatively value-free knowledge base on which the public and policy makers can make decisions, after having considered the information, and integrated their own values and priorities'.

Mistrust, however, exists, often exacerbated by media reports which represent 'both sides' without giving an indication of the weight of opinion – or even whether it is fact or feeling based.

Finding the path forward will require examination of advantages and disadvantages, the costs and the profit – hearing the stories and looking at the impacts. This will require education, promotion of the stories around the facts, acceptance that we don't know everything, and constant restatement that we are all working for a net-benefit to New Zealand and, indeed, the world.

Increasing public confidence in chemistry technology is vital to achieve the Millennium Sustainable Development Goals of improved health and nutrition. It is also a goal in the work of the EPA, with its vision of protecting the environment while enhancing the lifestyle of New Zealanders and the economy. A chemical-free life is not possible – mostly because life is chemical… and working together we can be the agents of change in people's understanding.

Jacqueline Rowarth is Chief Scientist at the Environmental

New meth standard

A new standard has been introduced to manage the risk of methamphetamine in residential properties.

The most significant change is the new 1.5µg/100cm2 limit, as compared to 0.5µg/100cm2 under the old guidelines. These are focused solely on the risks of a clan lab, whereas the new standard results from a better understanding of the health risks.

The new standard forms an important part of new legislation introduced to Parliament last month – the Residential Tenancies Amendment Bill (No 2) gives landlords the right to test for meth and enables tenancy agreements to be terminated when levels are unsafe. The new standard will be referenced in the regulations and will become legally enforceable when the Bill is passed later this year.

See the new standard, NZS8510:2017 Testing and decontamination of methamphetamine contaminated properties, at https://www.standards.govt.nz/sponsored-standards/testing-and-decontamination-of-methamphetamine-contaminated-properties

Simple solution to sticky problem

If any NZIHSM members ever find themselves dealing with a molasses flood, best practise is to dilute it with sea water.

After the deadly molasses flood in Boston on January 15, 1919 firefighters tried in vain to sluice away the deep residue after the port's giant molasses storage tank that exploded letting loose a sticky, destructive and deadly tidal wave up to 8m tall. It was discovered that only sea water would cut the gunge (because elements of the molasses react with salt).

It was described as a tragedy like no other. The molasses' viscosity meant it was like liquid mud, moved at 56 kph and carried a punch of 25 tonnes. The giant tank alongside Boston's inner harbour was 15m tall and 86m in girth and was full to the brim with 8,782,000 litres (14,000 tonnes) of molasses landed from the West Indies. After the flood passed, it lay in pools up to thigh-deep in places.

At noon that day, the distillery super-intendent took a cursory look at the imposing tank, ignored the molasses sweating ominously through the riveted seams, and left for lunch downtown - thus undoubtedly saving his life. But the busy market district was thronged with people destined to be less fortunate. Along Commercial Street, trucks and horse team drays clattered on the cobblestones beneath the elevated railway. In the doorways of shops and brick dwellings across the street from the tank, residents were taking advantage of the warm weather to sun themselves.

In stables of nearby draying companies, dozens of work horses were placidly munching hay. Teamsters chatted over their lunch boxes on the freight-loading platforms. The time was 12.41pm.

At this moment a local patrolman was making a routine duty call at a police-signal box down the street. Suddenly he heard a grinding, rumbling noise. Looking up, he saw a dark sea of liquid gush from the bottom of the tank. He saw the big tank open out and fall apart, and a towering wall of molasses roll over the ground with a seething, hissing sound.

At the same moment, the driver of a northbound train coming around the curve on the elevated railway yanked his emergency cord. "All I could see was molasses rushing towards me." The train stopped just as the elevated structure ahead sagged into the raging molasses below; the forward wheel trucks of the first car were lifted off the rails.

Another local saw a three-storey house rise from its foundations, 'fly into the air', then disappear beneath the elevated railway line in a cauldron of floundering horses, people, jagged timbers, splintered wagons, huge crates of goods and molasses.

To many people the breaking of the tank came with a tearing sound, like the ripping of a

Firefighters opened hydrants in an attempt to dilute the sludge. Photo: *Boston Fire Dept*

The sticky tidal wave swept away buildings, people , horses, damaged the elevated railway (at left) anddemolished the North End market (above) before oozing into the inner harbour. Photo: *Boston Library*

huge sheet of paper. To a Navy gunner on a ship in the harbour it was like a succession of reports from an impossibly enormous machine gun. The tearing sound was caused by the initial giving-away of the tank at its base; the machine-gun reports were rivets bursting upwards from the bottom, like buttons popping off a vest.

One 122 sq m section of steel weighing two and a half tonnes was catapulted 55m into North End Park. Another murderous ribbon of half-inch steel plate swept across Commercial Street, sheared through a tree-trunk-size steel railway support column like a knife through butter.

A commuter was on his way to North Station when the tank burst. The next thing he remembered was lying in a doorway across the street with a young woman unconscious in his lap. "All around me horses and men were struggling in the thick molasses."

One man, running from the onrushing molasses when it overtook him, landed sitting and was swept right out into the harbour. Crewmen of the naval tug picked him out of the water sticky and frightened, but unharmed.

However, not so lucky were the 21 killed and over 150 injured.

It is said that even today, on a really hot day, you can smell the molasses trapped in the woodwork and bricks of the old town.

Uncle Archie

Kia ora HS PRACTITIONERS!

HSAW (Hazardous Substances) Regulations

The Health & Safety at Work Hazardous Substance Regulations are now here and soon to be functioning! Much early commentary is positive about a "lift and shift" although at 549 pages, DO NOT try to lift this too often, or risk a hazardous drop on your foot!

Genetically Modified Organisms

The new HSAW HS regulations may signal the end of major consideration of the NO from HSNO but here's to those who tell us that there are no GMOs around as they munch on their 'seedless' grapes!

Time traveller training?

When we last commented that the NZIHSM office may be offering time traveler training at their last seminar, we suggested 'Watch this space!'
Sadly at their seminar there were a number of speakers, but not a glimpse of time travel!
Possibly of more concern is that they didn't provide space in their last magazine for my comment! What has happened to free speech and why must we be on a 'good behaviour' bond?

Why not ignore the environment?

The noted wheelchair critic Stephen Hawkings has again recently commented that if we continue to ignore the environment we risk "turning Earth into Venus" with 250°C temperatures and acid rains. But where does he find the time to think about these things and what would he know?

Robots and Artifical Intelligence

Since our last comment on the Accountants Australia and NZEI reports that "in the next 20 years there is an even chance that a robot will steal your job" we have received some input into the importance of artificial intelligence to the development of humankind.

Possible benefits include driverless cars, automated machines, instant information and the replacement of manual labour!

This is all good stuff, however for our current economic systems where humans only get paid for hours worked, and talk of 'street dwellers', how do we ensure our systems maintain the livelihood for all humankind?

Proof of AI??

Listening to much of the recent political debate, listeners could be excused for thinking that AI is here already!

Environmental Controls?

The latest HSAW HS regs include for Flammables (Class 1-5) and Toxics (6,8) but why are the Class 9s (Environmental toxins) only in for information only?

Brexit

Some Britons have voted for leaving! Given that a new trend has spray bottles of acid or bleach being used for acid attacks around London, there is talk of declaring these two hazsubs as dangerous weapons? Possibly leaving is not a bad option!

Trumpit

What can we say??

Battle of the Bugs!

As part of the winter season we are reminded that us humans are in an eternal battle with the bugs. While not talking on behalf of all Australians, the bad news is that bugs may beat us as they eat a lot less and tend to reproduce far more rapidly!!!

Global sea level rise caused by algae??

Scientists have reported some concern that significant parts of the 3km thick Greenland ice sheets may actually be melting fast enough to significantly raise global sea levels and swamp some coastal landmass much faster than initially expected.

Part of the problem seems to be that the warmer air temperatures are promoting the growth of dark skinned algae in melted top ice water which in turn leads to 'dark ice' which attracts more sun-heat, and faster melting, etc!!!

Why can't nature be simple and take more than 530 pages to write about it??

If you want to send your comment, you can send it to archie@NZIHSM.org.nz.
The ideas expressed in this column are not necessarily the views of the NZIHSM or Flashpoint and in some cases the NZIHSM frankly does not approve!

Drive-on tramping hut:

Water and waste, no worries

"Remember man that you are dust and to dust you will return!"

These were the words from the ancient text that were read to the departing beloved.

Perhaps these ancients did indeed understand more than one would think of the natural biological cycle! They could have said "Remember man that you are ... it and to ... it you will return", but this is highly unlikely to appease the grieving parties.

However, our ancients were right in that this is the natural cycle and as part of this is how to treat your waste products in such a way as to continue the natural cycle!!

So how do you set-up a life giving water supply and handle waste where local city services are not available?

All life requires water, most humans need about two litres per day, but when you are far away from a 'town supply', how do you find your own? How do handle your waste, sewerage and outputs? Can we recycle and reuse our own waste streams?

In our second of the short pieces on how to set-up an off-grid eco-house, we will try and cover water and waste.

The water

All humans and most life needs water. The Roman empire became great when methods of finding and conveying large quantities of water over significant distances to major storage depots were developed. From this technical advance the large modern 'cities' of humans were able to live together. But what do you do when there is no municipal water available?

Main choices

The main choice seems to be that you need to find your own, and fortunately in NZ, water falls freely (in both senses of the word) from the sky and if you can collect it, you have a supply. There was a stream on the property but at 50 metres below and no significant electrical supply. it is very hard to pump the stream water up to the house above.

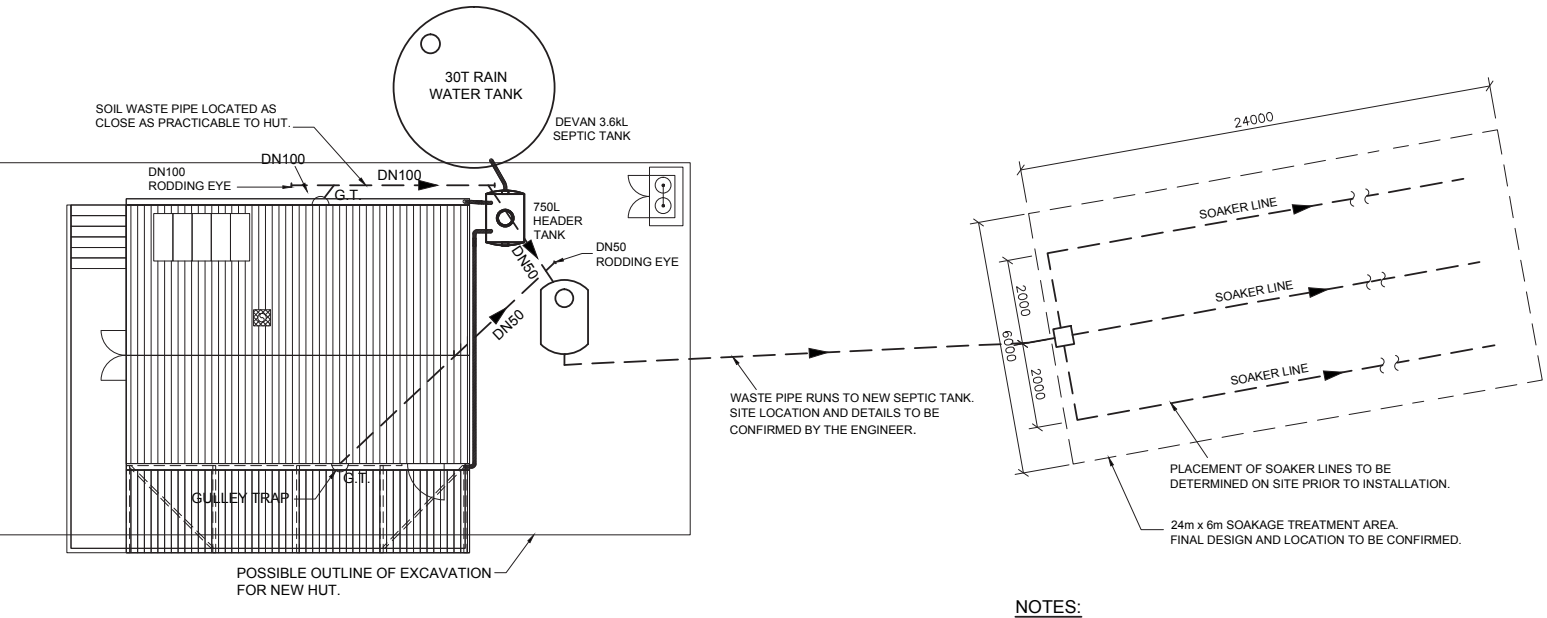
The second 'rural' method is to collect it off your roof when it rains. But amazingly there was almost no rain over a three long summer months, and minor doubt was forming about NZ hills with no rain? Fortunately at the beginning of April the skies sprang open and a 30 tonne water tank was filled in three weeks (see photo below). But who wants to deal with a noisy water pump in such a peaceful location?

We didn't, but by using the DOC and NZ 'old plumbers' trick', a header platform and tank was built below the roof gutter but above the sink levels so that 'gravity' could be used to supply a constant supply of free, quiet water. Thankfully, while care needs to be taken to ensure no contamination, the theory worked and water was freely available!

The waste

Humans make a lot of waste and the question of how to get rid of it without too much damage to the environment is an interesting one.
As there was 'no municipal waste' available the decision was made to:

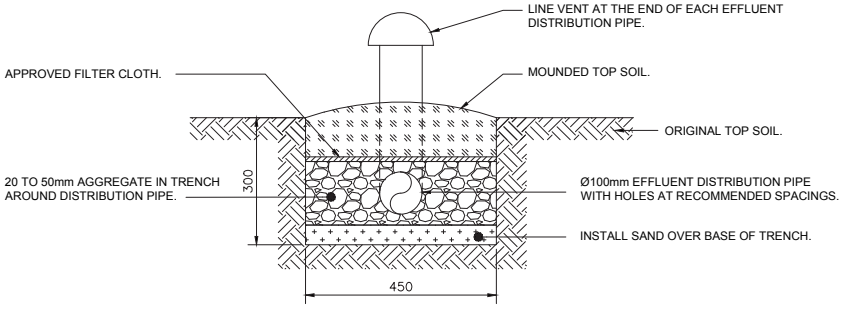
- only truck off small quantities of unburnable solids, or bury it and;
- re-use and burn the combustible solid waste in a wood burner to provide the necessary heat (Note: emissions offset by lots of trees);
- treat the liquid and human waste using 'friendly bugs' to break this down so that after a suitable time (in a septic



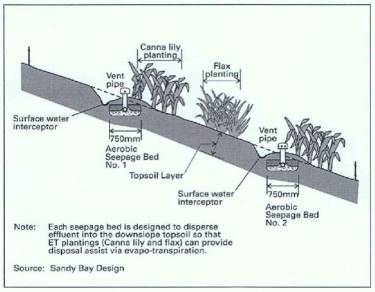
PROPOSED HUT WASTE WATER SERVICES ~1:100

NOTES:

1. ALL ITEMS MUST COMPLY WITH LOCAL BODY REQUIREMENTS AS OUTLINED IN THE LOCAL COUNCIL DISTRICT PLAN FOR RURAL REQUIREMENTS.
2. ALL WORK SHALL COMPLY WITH THE NZ BUILDING CODE, ALL LOCAL AUTHORITY REQUIREMENTS, APPLICABLE STANDARDS AND REGULATIONS.



TYPICAL SECTION THROUGH EFFLUENT SOAKER LINE N.T.S.



EXAMPLE OF POSSIBLE SOAKER LINES INSTALLATION ON A SLOPED SITE N.T.S.

tank) it can be re-used on the pasture (see above).

Fortunately so far it has been proved that almost everything burns, and so the theory has been matched in practice!

Next time we will look at how to generate your own heat and power.

It is wonderful to have, water, waste and heat without the accompanying utilities bills!

HSAW – the detail

There is an oft used saying "when in doubt, read the instructions". Regulations are a bit like that – "when in doubt, read the contents". In this case the Table of Contents to describe the 20 parts and schedules along with a brief comment on each pat (section) is often the best way to try and describe 549 pages of regulations and we have also provided a more detailed article for those with specific interests to follow:

Contents
A good table of contents describing the 20 parts.

1 Title 30
These regulations are the Health and Safety at Work (Hazardous Substances) Regulations 2017 (well put).

2 Commencement 30
Commence from 1 Sept 2017

3 Interpretation 30
The definitions of terms used with some referral back to HSNO Act definitions (good to have all of these in one place).

4 Meaning of hazardous substance 43
The meaning of a hazardous substance is important and it would be good if this section could actually describe the hazards rather than just referring back to HSNO Act.
PCBU = Person in charge of Business Unit now means that nearly ALL involved with the handling of a hazardous substance have responsibility for that handling.

5 Transitional, savings, and related provisions 44
A reference to schedule 1

6 References to class, hazard classifications, etc 44
Describes nomenclature for hazardous substance classification properties & ref to HS (Classification) Notice 2017. (eg: Class 3.1B means 1st numeral (Class: Flammable), 2nd numeral (subclass), letter (degree of hazard) (rather flammable).

7 References to standards 45
Regulations refer to known standards (eg: ASME or NZS or AS, etc).

8 References to distances 45
Distance means shortest horizontal distance.

9 Separation distances not to extend beyond boundary unless agreed 46
(very wise to get your neighbour's agreement where HS are close to boundary)

10 References to quantities 46
quantity-ratio sum = Σ [qpi/qai] < 1 ie: where there are more HS quantities present than allowable HS classification threshold quantities, then suitable hazsub controls must be in-place.

11 Safe work instruments that impose or modify requirements 47
Safe work instruments are a (new) tool to describe specific Hazsub controls for specific hazardous substances.

12 Safe work instruments that prescribe exposure standards 47
A safework instrument may describe an exposure standard.

Part 1 Application
Application to Armed Forces (and other special entities). The defence forces, natural gas distributors, and some other noted exceptions do not need to comply with hazsub reg requirements.

Part 2
Labelling, signage, safety data sheets, and packaging.
PCBU now have responsibilities for signage, safety datasheets and packaging as well as suppliers.

Part 3
General duties relating to risk management.
An inventory (or list) by PCBU of all hazardous substances onsite is now clearly required and the PCBUs are responsible for managing all the risks associated with all the hazsubs on-site.

Part 4
Certified handlers and supervision and training of workers.
A PCBU must ensure that every worker who uses, handles, manufactures, or stores a hazardous substance (including hazardous waste) receives training and supervision and is, before the worker is allowed to carry out or supervise work involving those substances, provided with:

(2) The information is—

(a) any operations in the worker's work area where hazardous substances are present; and

(b) the location and availability of known reference material on the hazards, safe handling, and storage of the hazardous substances found in the workplace, including (without limitation) safety data sheets.

(3) The training and instruction must include—

(a) training and instruction in the following:

. (i) the physico-chemical and health hazards associated with the hazardous substances the worker uses at work:

. (ii) the procedures (if applicable) for the safe use, handling, manufacture, storage,

and disposal of the hazardous substances:

. (iii) practice in the safe use of plant (including personal protective equipment) necessary to manage the hazardous substances:

(iiia) the worker's obligations under these regulations:

(iv) the actions that the worker should take in an emergency involving the hazardous substances; and

(b) an appropriate period of practical experience of the matters described in paragraph (a), under direct supervision in the workplace.

Approved handlers gone

So specific HSNO Approved handlers for sites are gone except for some highly toxic substances that now need 'certified handlers' but training for ALL workers is now required which should be positive, albeit with some initial teething issues for compliance certifiers who now need to assess the 'adequacy' of training for all during their certification process.

Part 5 Emergency management.

PCBUs must ensure that fire extinguishers and Emergency Response Plans (ERP) are prepared, present, annually tested and followed.

Part 6 Compliance certification.

This part deals with Worksafe's powers and methods to appoint compliance certifiers, compliance certifiers' responsibilities, compliance and conditional certificate issues, PCBU requirements for compliance certificates and performance standards to be prepared and published by Worksafe.

Part 7 Controlled substance licences.

This part deals with the requirements for Controlled substance licences

Part 8 Controls applying to all class 1 to 5 substances.

This part deals with Requirements for Class 1-5 HS to have a compliance certificate, the transportation of HS and exemptions for police, and alcoholic beverages.

Part 9 Class 1 substances .

Controls on hazardous substances where class 1 substances are present.

Part 10 Class 2, 3, and 4 substances.

Controls on hazardous substances where class 2, 3 and 4 substances are present including standards, security, segregation, substance zones, electrical requirements and control of ignition sources, leak or flammable vapour detection, refrigeration, 4 HSNO options for vapour/oxygen/ ignition control.

For HS locations controls, include a location established, building and ignition.

For class 3.2 and 4 substances temperature and ignition controls.

controls and zones, secondary containment, obtain compliance certificates, separation and transit depots.

Part 11 Controls relating to adverse effects of unintended ignition of class 2 and 3.1 substances.

Controls on hazardous substances where class 2, 3 and 4 substances are present including standards, building types, ignition control, separation from public and protected places, LPG controls, Class 3 rooms, storage and separation requirements for class 2 and class 3 activities including buildings, stationary containers, retail.

11 Pt 3: Calculation of separation distances, LPG,

Part 12 Class 5 substances.

Controls class 5 substances are present and any other substance that may react or combust with Class 5 substances including establish location, security, ignition controls, suits PPE, 1° and 2° containment.

Part 13 Class 6 and 8 substances.

Controls on hazardous substances where class 6 and 8 substances are present including standards, records of application, record keeping, PPE and appropriate equipment, certified handler and CSL licence for 6.1A, B and 6.1 substances, security, transportation and reference to schedules 13-16 security, compatibility and containment schedules for Class 6 & 8 HS, signage.

Part 14 Fumigants.

The controls in this part are in addition to those in Part 13 and other provisions of these regulations that apply to fumigants.

Fumigants to be under the control of a certified handler unless exempted. Fumigants to have signs, notify neighbours, be properly ventilated but not leak when in use and be maintained below the max level of exposure. Records are to be kept of application and kept within allowable area or distances, have entry restrictions.

Part 15 Gases under pressure .

A "lift and shift' from the previous regulations.

Part 16 Tank wagons and transportable containers.

A "lift and shift' from the previous regulations.

Part 17 Stationary container systems

A mainly "lift and shift' from the previous HSNO Gazette 35 regulations although this can be a complex area with some practical and/or engineering knowledge required so care is advised in this area. However, for many hazardous (and oil-based) chemicals the environmental trigger levels for bunding or

secondary containment and other similar HS controls were significantly lower for the environmental effects (Class 9) than for flammables & toxics (HS Class 1-8) under the HSNO regulations. So with Class 9 now, for information only, it will be interesting how this is applied. However, no doubt the courts will make decisions here after the first couple of tonnes of oil drop into the harbours or water supplies.

It is good to see the old HSNO Gaz35 Clause 5 or new clause 17.3 Accepted engineering principles and practice to be applied in a way that is (a) reasonably practicable, rather than a straight 'checklist' approach for those times where legislation does not always match Mother Nature's foibles. We live in hope that this is also practically applied.

Part 18 Laboratories.

Part 19 Tracking hazardous substances.

A "lift and shift' from the previous regulations

Part 20 Consequential amendment to other health and safety at work regulations.

The schedules

There are a truckload of useful schedules with adequate descriptions below, we suggest that you read these.

Schedule 1 460 Transitional, savings, and related provisions.

Schedule 2 481 Hazardous substances compliance fees.

Schedule 3 483 Quantities of hazardous substances that require signage.

continued next page

Wait-and-see on TiO2

The industry is in wait-and-see mode over the possible reclassification of titanium dioxide (TiO2).

Titanium Dioxide (TiO2) is an inorganic white powder used in a wide number of industries including paint, plastic, cosmetics and food to name but a few, and provides the white colour and opacity (due to it's high refractive index) to products.

There are two main routes of manufacture, one via a sulphate route and the other by a chloride route. In order to provide exterior durability, the particle is often coated (eg alumina, silica, zirconium). It has been in use for a number of years, and to date there is nothing out there that meets all of the requirements as a potential replacement. More recently there has been increasing use of nano-titanium dioxide in multiple fields

IPPIC (International Paint & Printing Ink Council) New Zealand representative Neil Debenham says French regulators earlier this year proposed it be classified a Category 1B carcinogen (HSNO 6.7A in our language), based on a scientific inhalation studies in rats from the 1990s, so under GHS, this would mean that any substance/material containing more than 0.1% of Titanium Dioxide would be required to be managed (including labeling) as if it was a Category 1B substance.

"The implications within Europe are that CMRs (Carcinogens, Mutagens & Reproductive Toxins) are not allowed to be retailed. Anyway, some semblance of sense has prevailed, and the European Reviewing Committee is now recommending that it is classified as a Category 2 Carcinogen (HSNO 6.7B), with this recommendation set to be formalised later this year, whereupon it will need to be ratified by the European member states before being finally classified. It is expected that the final decision may take a number of years."

The Titanium Dioxide Manufacturers Association is busy re-commissioning a number of exposure scenario's using all forms of the product, in order to confirm or negate the original study, and as a last resort is looking to have the classification restricted to inhalation only, he said.

"So, what is the issue – it is around the principles of GHS, and if this classification does get adopted, what is it going to mean specifically for New Zealand, our rules currently do not restrict the sale /use of Category 2 carcinogens, indeed there are many currently out there."

It is also believed that New Zealand takes a more risk-based approach as opposed to the hazard based approach of GHS, so maybe EPA may choose to amend any proposed classification based on risk/benefit analysis. "But this flies in the face of the principles behind GHS where there is a single global classification. There are already enough variations between countries in respect to what has actually been adopted, leading to the fact that global is not worldwide.

"This is a wait and see issue, which could have wide ranging potential ramifications for the NZ household as well as industry."

Schedule 4 486 Quantities of hazardous substances that require fire extinguishers.
Schedule 5 488 Threshold quantities for emergency response plan.
Schedule 6 491 Maximum quantities of certain class 1 to 5 substances permitted on passenger service vehicles.
Schedule 7 492 Licensing requirements for class 1 substances.
Schedule 8 499 Matters relevant to class 1 substances.
Schedule 9 504 Matters relevant to class 2, 3, and 4 substances.
Schedule 10 510 Matters relevant to class 5.1.1 and 5.1.2 substances.
Schedule 11 513 Matters relevant to class 5.2 substances.
Schedule 12 516 Calculation of separation distances.
Schedule 13 521 Class 6.1 substances that require controlled substance licence.
Schedule 14 522 Quantities of certain class 6 and 8 substances that must be secured if left unattended.
Schedule 15 523 Incompatible substances and materials.
Schedule 16 524 Threshold quantities for secondary containment of class 6, 8, and 9 substances.
Schedule 17 525 Minimum separation distances for stores of packaged class 6.1 substances.
Schedule 18 527 Matters relevant to fumigants.
Schedule 19 531 Compliance certificates for imported UN Model Regulations cylinders.
Schedule 20 533 Capacity of containers containing gases under pressure.
Schedule 21 534 Design standards for gas containers.
Schedule 22 540 Intervals from manufacture for periodic tests and certificates.
Schedule 23 541 Forces able to be resisted by attachment of tank to chassis.
Schedule 24 542 Requirements for design, pre-commissioning, and in-service compliance certification of tank wagon.
Schedule 25 543 Separation distances for above ground stationary tanks.
Schedule 26 545 Tracking of hazardous substances.
Schedule 27 548 Information to be included in record of tracked substance.

Hundreds killed in petrol explosion

Hundreds of Pakistanis rushed toward a crashed tanker to collect the spilled and leaking fuel.

Using buckets, bottles and cans, they scooped up some of the 20,820 litres of fuel gushing onto the road. For about an hour, men, women and children from nearby villages, as well as some passers-by who pulled over in their cars and motorbikes, collected the windfall, despite attempts by the police to warn them away.

Then, suddenly, the truck caught fire and exploded, killing at least 150 people and seriously injuring at least 100 others.

At least 73 motorbikes and several cars were destroyed.

Grenfell Tower causes scatter

Building codes, fire regulations and no doubt HSNO provisions are being poured over in the United Kingdom in the wake of the dreadful Grenfell Tower fire.

It seems more than probable that heads will roll, and they may well be some very senior heads. The fact that Police say there are reasonable grounds for charges of corporate manslaughter considerably ups the ante.

The next few months will be a severe test for those in local body politics, being stuck between the public and central government. But however people try to dodge and weave, the design of several aspects of the building proved fatal, so first to be staring at the guillotine must be the building inspectors who signed all this off.

It is easy to say after the event, but it is an inescapable truth that plastic born of petroleum will burn, given the slightest opportunity.

There is a lot of technical stuff associated with the disaster and other countries have been quick to pour over their own situations. About 600 buildings in England are thought to have the cladding and local authorities rushed to inspect their own. Before long people were being evacuated from some while closer inspections were made.

By the end of July, 111 high-rise blocks using a combination of material failed the second in a series of tests confirming that a cladding system using aluminium composite material panels with a polyethylene filler and stone wool insulation "does not meet current building regulation guidance".

Of the affected buildings, 90 are said to be local authority or housing association-owned or managed.

In New Zealand, MBIE says two buildings have been found with cladding panels similar to that used on the Grenfell Tower. They are undergoing cladding replacement as a consequence of weather tightness repairs.

The New Zealand situation for building fire safety is different to the UK that relies heavily on passive-fire (e.g. solid construction) to limit rapid spread of fire and smoke.

To provide a local context, a 24 floor apartment building in New Zealand would typically have an automatic fire sprinkler system and building-wide alarm system, two stairwells and a fire riser main in the stairwell for fire service use.

In New Zealand there are typically many systems that work together to provide the life safety to occupants (e.g. sprinkler plus early warning

Grenfell Tower lit up London's night sky and buring cladding was still cascading off the building come morning.

smoke detectors and building-wide alarms) within a building and the failure of one system does not necessarily mean a catastrophic failure of the whole system.

MBIE has asked metropolitan councils to report on the use of combustible aluminium composite panel to assess the extent of its use in New Zealand. Local councils will deal with any specific high-rise buildings identified with cladding comprising of a combustible aluminium composite panel product.

Life & death decisions

As the details emerged, firefighters talked of running into Armageddon, doing 20 floors on one cylinder into increasingly dangerous conditions, making life and death decisions without adequate information, screaming children, fighting their way upward against a stream of hysterical occupants trying to get down to the one exit. For those inside the building it was a nightmare come true; for those outside,they could only wait… and hope.

One report said the first responders on the fireground got to the original call – a fridge on fire – they dealt with that and were stunned when they emerged outside to see part of the outside of the building on fire. How the blaze made the transition will be key in the enquiry.

Firefighters said the scale of the fire was unbelievable and they were having to make life and death decisions based on how much air they had. It was often a case of save the people you have already found – that meant leaving whoever might still be on higher floors being either left to die or already dead. It was a brutal introduction for a young firefighter only five days into her career.

The aftermath... Photos: *NBC* and *The Guardian*

Being outside the building was somewhat safer where firefighters used police riot shields to protect them from burning debris and bits of, or whole, bodies dropping from above.

In the immediate aftermath stories began to circulate about the recently-applied new cladding which the fire raced up, having been outlawed previously, of design faults etc, etc, and the accusations flew.

No doubt the building's adherence to building policy will be picked apart and demands will be made insisting all buildings have sprinkler systems regardless of age, the number of fire exits and so on.

The confirmed death toll stands at 80, though 120 people are missing. Police have recovered 87 pieces of human remains but much work will be required to establish how many bodies they belong to. Given that temperatures reached 1000º C, it is likely than no more positive identifications will be possible.

Technical detail on the building and the fire's likely progress can be found on: http://www.bbc.com/news/uk-40301289 and http://www.bbc.com/news/uk-england-london-40272168

NZ Institute of Hazardous Substances Management (Inc)

MEMBERSHIP APPLICATION FORM

1. Name: ……..

First Name *Surname*

2. **Employment**

Business/Employer's Name: ……

***Position and Contact Details**:*

Position Held: ……..

Qualifications: ……

Experience in HS:

……

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……

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3. Preferred mailing address:

……

……

……

Telephone Contacts (Bus.) (0) ……

(Res.) (0) ……

(Mob.) (02) ……..

(Facsimile) (0) ……

E-Mail: ……

Website: ……..

4. I have previously been a member of the Institute ❒Yes ❒No

If NO: I am applying to be a ❒Member ❒Associate member

5. **Return to**: P O Box 10-385, The Terrace, Wellington
Email: office@nzihsm.org.nz

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