

## Issues re the disposal of drilling wastes on farms (landfarms, mix-bury-cover)

Prepared by Catherine Cheung, Climate Justice Taranaki, 4 July 2013

- 1) In terms of science, there is simply not enough information to assure us that the practice is safe.** We don't know what impacts the practice may have on the environment, soil health, animal health and food safety, especially the **cumulative effects** in the longterm. With the rapid expansion of the oil/gas industry, the ramifications are huge and any adverse impacts can become far reaching and irreversible. Surely, a responsible government would take the precautionary approach, and not allow this to happen until safety can be proven. Yet it seems our government is allowing an uncontrolled experiment to manifest itself across our region! It's a mockery to the precautionary principle when companies, and often the government, ask concerned groups and individuals to prove that harm has been made before they'd stop their risky practices!

TRC's own technical report (Oct 2011) – [Land farming of drilling wastes: Impacts on soil biota within sandy soils in Taranaki \(Year 1 of 3\)](#) – admitted that *“At present, there is a **paucity of information on “safe” concentrations and practices for land spreading in relation to soil ecosystems and biodiversity under different field conditions**”* and *“there is a lack of information to **inform** local authorities’ decisions regarding the granting of resource consents, the surrender of consents and the formulation of consents.”* The first year of the study did **not** reach any definitive conclusion.

Previous studies *“suggested that earthworm populations had been impacted upon by drilling waste application but that they were making a slow recovery.”* **None of these studies looked at potential impacts on livestock or food products** derived from them. **Fracking wastes were not included in this study.** The chemicals involved in fracking are numerous, many have not been tested adequately, some are not even known because of trade secrets.

- 2) In terms of monitoring and regulatory processes, a great deal of improvement is needed.** Based on many TRC reports, monitoring programs rely largely on visual inspections and scant samples (collected by council) and company data. Often company data are not provided in full. Unauthorized incidences and breaches of consent conditions are common. In some cases, council lowered or removed the conditions altogether after companies failed to comply. Note most discharge consents are valid for well over a decade, often with multiple revisions offering change in conditions.

## Landfarms

Take the **example of BTW's Brown Road** (Waitara) landfarm, TRC report 987702w (March 2012) (replaced by a [1141122 “\(corrected version\)”](#) in Jan 2013) said, *“Concentrations of contaminants in the surface soil meet the required consent conditions, with the **exception of hydrocarbons** for recent disposals. Further monitoring of the site will ensure that any consent limits exceeded, are complied with prior to surrender....”* Note discharge consents 6867-1 and 7670-1 do not expire till 2020 and 2027 respectively.

Yet inspection on 20 August 2010 reported, *“Grass regrowth for the recent application area looked well established, and bulls were grazing the pasture...”* **So it seems cows may be grazing onsite before consent limits comply, when hydrocarbon concentrations are above limits?**

BTW company annual report (Appendix II of the above TRC report 987702w) includes Table 1: Stockpiling and landfarming records which stated that 384m<sup>3</sup> of **“Frac” waste** was spread on 9 July 2010. In Table 1, under the heading ‘Treatment applied’: *“The fracture water was landfarmed after being stockpiled for a minimum of two months. Over this time the water was diluted by stormwater and subject to UV treatment by sunlight. Fracture water was not tested upon arrival to the site. Prior to landfarming, testing concluded the water was appropriate for landfarm.”*

Importantly, pre-disposal results in Appendix III from a Nov 2010 [report 778400](#) revealed the presence of **Gluteraldehyde in “Frac water” pits A and E**. There were no testing results of other contaminants such as heavy metal, BTEX, total hydrocarbons or PAH listed. Gluteraldehyde is highly toxic and is dangerous at concentrations at or below chemical detection limits. If released to soil, it may metabolise and is expected to leach to **groundwater**.

Another example: TRC’s monitoring program (2005-06) of the **Geary Road landfarm, Manutahi**, was based on 12 inspections and 2 soil samples (collected by TRC) and data provided by the consent holder ([TRC report 169501](#)). The inspector commented on 10 Nov 2005, *“Recent spreading had taken place near the new pits. Stock were grazing the new areas- G32 and G33”*. On 13 Feb 2006, the inspector reported, *“Areas G30 to G34 had been grassed and were being grazed by heifers. A drilling rig was onsite at Kauri E.”* Analyses of many disposal areas, including some where stock were grazing, showed that **further degradation of TPH (total petroleum hydrocarbons) was required**. For reasons **unknown**, analytical results concerning levels of highly toxic hydrocarbons (e.g. BTEX and Naphthalene), and metals (e.g. arsenic and cadmium), were not presented in the report.

Likewise, a [2011 report on the Geary, Schrider and Spence Road \(Kakaramea\) landfarms](#) said, *“Most disposal areas comply with the limits specified in the consent **but not all areas have been tested for all parameters.**”* Why not? Nitrogen loading for three disposal areas exceeded the consent limit. On 4 February 2010, the chloride loading limit was removed from the consent. To quote from the above report: *“No chloride results were provided for the H65 and H62 wastes which were landfarmed prior to the consent change. **The three disposals for which nitrogen results were provided all exceeded the loading limit. Previous monitoring at landfarming sites has shown that loading limits were seldom complied with.** In coastal locations, adverse effects on groundwater due to leaching of chloride and nitrogen are expected to be minimal. The **Council allowed landfarm operators at such sites to vary their consent conditions**, but has implemented a programme of biological soil monitoring to determine the effects of high loadings (particularly chloride) on soil health.”*

So is Council effectively saying that excessive chloride and nitrogen are ok to be leached into coastal environments? How will excess nitrogen affect coastal ecosystems, marine life and kaimoana? What about other chemicals that were not tested for? Are they ok to be leached into the coastal environments?

## Mix-Bury-Cover

[TRC's mix-bury-cover monitoring program report \(2010\)](#) listed 55 consents for MBC held by 12 companies, although not all consents have been exercised. *"It is unclear whether some of the older consents in Table 4 which have been renewed (-2 suffix) were originally exercised or not, in some cases sumps containing drilling waste **may remain buried on site.**"*

If TRC doesn't know whether the consents had been exercised, who does? What does that say about the level of TRC's monitoring and regulatory regime?

TRC's [2012 significant activities report](#) lists 9 deepwell injection operations (17 consents) and 29 drilling waste operations (63 consents) including 20 Mix-Bury-Cover (MBC) and 2 stockpiling sites which had "tailored compliance monitoring programmes" in 2011/2012 (Appendix III). Were the other sites monitored and if so, what kind of monitoring?

TRC's [miscellaneous mix-bury-cover monitoring programme triennial report \(2008\)](#) assessed the performance of ten companies in their MBC operations. During that period, TRC conducted 28 site inspections and collected 24 soil samples from 9 MBC areas. The report revealed a **nitrogen loading** of 1,120 kg at **Tag Oil's Cheal-B** mix-bury-cover site which **exceeded the consent limit. The failure to provide pre-disposal analyses and discharge records were also noncompliant.** Yet Tag Oil was granted a **"good" rating** for its performance and compliance.

An inspection commented, *"A soil sample was collected from the MBC area, which had been reinstated, it had good pasture cover and was **back in grazing**"* ([TRC doc 350614, 2008](#)).

Again, it seems animals are **back to graze before consent conditions are met**, is this right?

Below are some more excerpts from the same report, but re Bridge (now taken over by **Greymouth**) which obtained a **"improvement is desirable"** performance and compliance rating.

*"An evaluation of performance for consent 6641 (Richmond-1) is not possible. A well was drilled at the site in 2005 and muds were disposed of via MBC. The location of the disposal area cannot be accurately determined following reinstatement works. The MBC operation was not inspected by the Council and despite requests by the Council, the Company has failed to provide any information relating to the disposal."*

Inspectors' comments at Hursthouse MBC site:

*"21 June 2007 - The landowner was not happy with reinstatement of the site. The weather was very wet at the time MBC was carried out in the sump. Mud was mixed with soil, then cover was applied but when compacted the mud came to the surface up the sides of the sump. This mud was spread out on the southern side of the sump. A soil sample was collected from this area and mud was evident a few inches below the surface."*

*3 June 2008 - **The site was inspected and was in use as a feed pad. The site was metalled, making it too difficult to collect a representative soil sample from the MBC area.**"*

How can we be sure that the area is safe for grazing when no representative soil samples had been tested?

Also, note that appendices, notably **analytical results provided to council and additional monitoring, are not included** in the report. Why?

- 3) Moreover, there are **numerous other sites where discharge consents have been issued for drilling wastes to be introduced into the environment**; emissions to air, discharges on/into land, on land in the vicinity of rivers or directly into streams. TRC website lists the [non-notified consents](#) issued each quarter/month. Focus on non-agricultural discharge when researching about oil and gas. Basically, every wellsite (with its multiple wells) has a suite of discharge consents (to air, land and water) associated with it. E.g. Origin Energy holds 36 discharge consents for its wellsites associated with the [Rimu Production Station](#) in Mokoia alone.

Please have a look at the [google map on Taranaki's oil and gas sites](#). It gives a fair idea of the scale and scope of the industry and its current and emergent impacts on people, livestock, the environment and other economic backbones that rely on healthy, uncontaminated soil, water and air.

There're documented cases overseas from the USA to Australia where people and animals living close to wellsites have suffered from elevated levels of health risks. For specific scientific references regarding the wide ranging issues involved, go to Climate Justice Taranaki website:

<http://climatejusticetaranaki.wordpress.com/resources/science/>