

Sub (17)

Kilshannig House

Cratloe Wood

Cratloe

Co. Clare

Ms Ann Marie Donlon

Inspector,

Environmental Protection Agency

P.O Box 3000

Johnstown Castle Estate

Co. Wexford



16 February 2013

Dear Ms Donlon,

As the inspector to the licence review P0012-05, I have made you aware of the discovery of an unlined hazardous waste pit named H2, containing four and a half thousand truckloads of hazardous waste in our designated EU Seveso protected zone and located beneath the water table of the River Fergus.

1: I note the submission to the inspector of 11 February 2013 by RPS consultants acting for Roche Ireland Ltd and for the purpose of its licence review relating to Capping of the H2 hazardous waste unlined pit.

However please be aware that RPS consultants has already advised Roche Ireland Ltd in separate documents outside of this review, relating to Capping of the H2 hazardous waste unlined pit as follows:

"The Closure Options in the URS report (page 65) of "do nothing" and "capping" are not appropriate since the hazardous H2 area will still form an unacceptable risk post closure and neither option would prevent leachate overtopping and leachate discharge of the landfills into the River Fergus".

(RPS Document Control Sheet- Document No. MDE0451_Rp0002, Rev: Ref: F02,30 November 2005)

2: I note it appears the inspector is directed by RPS consultants acting for Roche Ireland Ltd and for the purpose of its licence review, to accept the exclusion of any monitoring of boreholes 21, 216, and 702 as quoted below:

"For the purposes of this assessment the monitoring results at boreholes 21, 216 and 702 have therefore been excluded as these are not considered representative of the wider conditions on site and if borehole 216 is to be decommissioned in the near future it is not appropriate to use this data for extrapolating future trends."

Fortunately I am in a position to give the inspector the monitoring results, provided by RPS consultants to Roche Ireland Ltd in separate documents outside this review, relating to boreholes 21, 216 and 702 re. the H2 hazardous waste unlined pit as follows:

"In summary, waste was initially landfilled into the H2 area between 1977 and 1980 with no control on filling processes, no lining, and no leachate control mechanisms. Waste disposal took place across a relatively wide area in numerous dispersed pits, including on land close to the artificially constructed Nature Area ponds. There was also a deep (5m deep, 750m³ capacity) trench through the centre of the area, close to well H2, in which some drummed wastes were disposed of. The H2 area is underlain by soft silty clay, underlain by peat in places, overlying rock (weathered limestone) which is considered a shallow aquifer. URS determine that the clay liner is between 0.6 and 3.0m thick in the H2 landfill area.

Wastes disposed of in the H2 landfill included metal and plastic drums of mauser, dimer, magnesium, suspected hydrochloric acid and spent carbon, undrummed carbon waste, rubber hoses, rubble, wire, polythene sacks (formally containing potassium hydride and dimer), undrummed white powders/pastes, cement bags, plastic sheeting, wooden pallets, timber, gloves, pipes, cables, paint tins, woven sacks, construction wastes, mesh/netting, centrifuge core mesh, aluminium cladding, fibre drums, glass sample bottles and secondary sludge. All of this waste would be collectively considered to be hazardous waste as defined by the EPA, based on the European Waste Catalogue System (EWC) of waste classification.

Leachate in the H2 cell is actively gassing (bubbling) in places (Dames and Moore 1997, URS 2005). Trial pit grab samples of leachate/shallow groundwater in 2005 detected VOC compounds in the leachate of dichloromethane (DCM) (0.01-110 mg/L), chloroform (0.012-5.4 mg/L) and toluene (0.098-857mg/L). Leachate was extracted from two pumping wells within the H2 cell for several years in the 1990's, but this has now ceased. To the south of the H2 area, well 216 has historically shown elevated toluene (up to 38 mg/l in 1996) and THF (up to 84 mg/l in 1997). Drummed wastes were reported intersected during drilling of well 216 in 1996, which is screened in the shallow aquifer between 4.6 and 5.6 metres below ground.

Drilling of well 702 at the southern end of the H2 area in 2001 led to significant rises in concentration of toluene, DCM and THF in nearby wells 21 and 216, which was inferred to be due to disturbance of drummed wastes. A rise in the THF concentrations has been noted in wells 514, 517 and 702 close to or downgradient of wells 21, 216 and 702 in 2003 and 2004 following this incident in 2001. The nature of construction of well 702 appears to provide a contamination pathway.

Overall, the H2 area is a historic hazardous waste cell, is unlined and is causing localised groundwater pollution on the Roche facility. URS estimate up to 90,000 tonnes or 60,275m3 of hazardous wastes lie in the H2 area. The H2 area constitutes a significant environmental liability for Roche."

Roche own consultants URS on Toluene in the H2 Hazardous Waste Unlined Pit

"However the continued high concentrations in wells 21 and 216 point to significant residual toluene in the H2 area, which is continuing to desorb slowly into the groundwater".

Roche own consultants URS on Drum Rupture Scenario in the H2 Hazardous Waste Unlined Pit

"Drilling of well 702 at the southern end of the H2 area in 2001 led to significant rises in concentration of toluene, dichloromethane and THF in nearby wells 21 and 216, which was inferred to be due to disturbance of drummed wastes (metal drums (possibly crushed) were penetrated during drilling of both well 21 and well 216). A rise in the THF concentrations has been noted in wells 514,517, and 702 close to or downgradient of wells 21,216 and 702 in 2003 and 2004 following this incident in 2001."

Roche own consultants URS on H2 area

"The trial pit studies in 1991 and 2005 show that the H2 area is distinctly different from the engineered cells in respect of both the emplacement of waste materials and the underlying geology. The waste in the H2 area was deposited in unlined pits up to 3.4m deep), with no facilities for leachate interception and collection. In some areas the wastes are emplaced below the water table (the water table was 0.85 and 2.59m below the well casing in surrounding monitoring wells in October 2004).

The natural clay soils are thinner (0.6 to 3.0m thick) under the H2 area than under the engineered cells and excavation of pits has further thinned or removed the protective natural clay layer in parts of the H2 area (the 'deep trench' was up to 5m deep and waste is present up to 3.4m below grade in TP27). Therefore leachate from this area may readily enter the main groundwater flow horizon in the shallow broken rock aquifer and migrate towards the river (as shown by recent events in well 216 following drilling in 2001).

The uncontrolled release of leachate from the H2 area to groundwater is not consistent with EPA guidance on leachate management at landfills during the operational or aftercare phases (EPA, 1997a)".

Roche own consultants URS on Monitored Natural Attenuation Option of H2 Area

"Monitored Natural Attenuation (MNA) is essentially a continuation of the current monitoring program in wells around the H2 landfill. The aim of MNA would be to document stable or improving groundwater quality around the H2 area (as was the case up to 2001) to the satisfaction of the regulators, as an alternative to active intervention. However, contaminant concentrations in leachate samples taken from the 2005 trial pits continue to show elevated concentrations of volatile organics (solvents), semi volatile organics (phenolics) and heavy metals 25 years after the cessation

of landfilling in the H2 area, despite extraction of contaminated groundwater from this area for several years.

It is therefore likely that MNA would have to be continued for decades in order to meet regulatory requirements, with no reduction of the risk of an unforeseen future incident, such as the drum rupture which occurred near well 216 in 2001, which could lead to future regulatory enforcement. Also, as previously mentioned, the release of leachate to groundwater is not consistent with EPA guidance on landfill operation and aftercare.

Annual cost for biannual monitoring around the H2 landfill as part of an MNA strategy are estimated to be of the order of €5,000 to €10,000.

MNA is likely to require extensive monitoring of the H2 area for a considerable timeframe and, while attractive as a low cost option initially, does not give Roche a long term reduction in the risk of a potential larger release and is not consistent with EPA guidance”.

Roche own consultants URS on Capping of H2 area

“Capping of the H2 area to reduce rainfall infiltration is considered to be of limited benefit, as the chemical/process waste in some areas is emplaced below the water table and there is through flow of shallow groundwater through the waste, driven by natural gradients due to the hillside to the west of the H2 area.

Capping would require considerable engineering works to profile the H2 area to promote runoff and manage the drainage, but would not eliminate the release of leachate to groundwater. In addition the presence of a landfill cap would restrict the future use of the H2 area and, despite the capital investment, would not provide Roche with a reduction of liability in the event of an unforeseen future incident.”

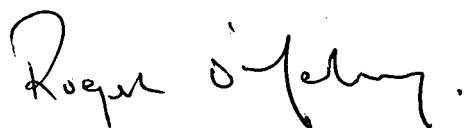
I note RPS has included the drillers log for Borehole 216 of the 23- 24 October 1996. I enclose an internal Agency “Memorandum” to “Each Director” issued seven working days later.

3: The inspector will be aware that on the 4 December 2012, I disclosed the existence of an additional 600 sq metres of waste in the H2 hazardous waste unlined pit and located in close proximity to the ‘Contractors canteen’.

I wish to alert the inspector to the opinion of RPS consultants given to Roche Ireland Ltd outside of this review, as follows.

“More immediately, evidence of free phase VOCs in the trial pits at the H2 area and associated risk of volatile gas escape (toluene/THF) requires a review of the health and safety design for the contractor’s yard which is understood to be nearby to protect human health.

Yours sincerely

A handwritten signature in black ink, appearing to read "Roger O'Mahony". The signature is fluid and cursive, with a large initial 'R' and a long, sweeping tail.

Roger O'Mahony

Encl: Memorandum to Each Director, from P.Nolan 4 November 1996

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Memorandum

To: Each Director
From: Licensing & Control
Subject: Roche Ireland Ltd. (Syntex)
Date: 04/11/96

In accordance with a previous decision by the Board, the company has been served with a summons for several breaches (nine in all) of their existing IPC licence.

Following the serving of this summons the company has put forward the following proposal:

-they will plead guilty to two breaches of the IPC licence. They will agree to the Agency selecting the relevant breaches. In this regard the Agency would select two significant breaches i.e that of 17 Dec., and either that of March or July. As far as the Agency is concerned these are the most significant breaches.

The company have confirmed on 4th November 1996 via our legal advisor by fax that they agree to proceedings on December and July breaches.

-the Agency acknowledge in court that the measures put in place by the company will ensure that they will not happen again. The Agency cannot go so far as to say that they will not happen again, but we could say that provided the measures are properly managed and maintained, the likelihood of a reoccurrence is greatly reduced and that the Agency is satisfied that they will improve the overall environmental performance of the plant.

- that the Agency drop the remaining seven incidents in the summons.

Having considered the matter within the Division, it is considered that it would be reasonable for the Agency to accept the offer made by the company. In the first instance it provides the Agency with a guarantee that the Agency will have a successful prosecution. The incidents have been selected by the Agency and not the company. Given the existing pressures on the Agency's limited resources it would be a very practical option as it would avoid the need for the Agency to have key personnel attend the court etc.

Recommended that the Board agree to the proposal by the company. The Agency will claim all costs associated with the case.


P. Nolan