



## Accident/ Incident Investigation

**Accident Ref No – I021-14**

**Name of Incident: Trace Fungicide Contamination of Surface Water Release**

**Name of Investigator: Carl Rowe**

**Time and Date of Accident/Incident: Between 1<sup>st</sup> May 2014 and 9<sup>th</sup> June 2014.**

**Investigated Date: Thursday 26<sup>th</sup> June 2014**

### Event

On Wednesday 25<sup>th</sup> June it was reported by the Laboratory Supervisor Marek Hussar that a Site Drainage release sample taken on the 9<sup>th</sup> June contained very low concentrations of Fungicide.

### Findings

- The Site Drainage release report from the 9<sup>th</sup> June was sent to the Laboratory Supervisor on 24<sup>th</sup> June by email from the external analysis company Jones Environmental Laboratories, but was not read until 25<sup>th</sup> June.
- Jones Environmental Laboratories are a UKAS Accredited Laboratory
- The Site Drainage had been released to the drainage ditch on the 9<sup>th</sup> June as the PH and clarity were found to have passed – see PW032 document.
- The Site Drainage sample was sent for external analysis on the 9<sup>th</sup> June as this was the 6<sup>th</sup> time the site drainage had been released since the last externally verified sample had been taken. A previous site drainage sample taken on the 1<sup>st</sup> May showed no signs of Fungicide within the site drains.
- The quantities of Fungicide reported in the external report were very low at 0.004 ppm 4 µg /l of Tebuconazole and 0.003ppm 3 µg/l of Epoxiconazole.
- Tebuconazole and Epoxiconazole are classified as R50/53 products - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
- The Eco toxicity results for Epoxiconazole is:
  - Fish Rainbow trout (*Oncorhynchus mykiss*) ..... 96-h LC50: 1.1 mg/l
  - Invertebrates Daphnids (*Daphnia magna*) ..... 48-h EC50: 0.63 mg/l
  - Algae Green algae (*Pseudokirchneriella subcapitata*) .. 72-h EC50: > 0.98 mg/l
  - (*Desmodesmus subspicatus*) ..... 72-h EC50: 8.78 µg/l
  - Plants Duckweed (*Lemna minor*) ..... 7-day EC50: 90.7 µg/l
  - Earthworms *Eisenia fetida* Sav. ....28-day LC50: > 1000 mg/kg soil
  - Insects Honeybees (*Apis mellifera*) .....96-h LD50, oral: > 100 µg/bee 96-h LD50, contact: > 200 µg/bee
- The ecotoxicity results for Tebuconazole is:
  - Fish Rainbow trout (*Oncorhynchus mykiss*) ..... 96-h LC50 17.7 mg/l
  - Invertebrates Daphnids (*Daphnia magna*) .....48-h EC50 21.5 mg/l
  - Algae Green algae (*Desmodesmus subspicatus*) ..... 72-h EC50 0.110 mg/l
  - Birds Japanese quail (*Coturnix coturnix japonica*) ... 14-day LD50 > 2000 mg/kg
  - Earthworms *Eisenia foetida* ..... 14-day LC50 > 1000 mg/kg dry soil
  - Bees Honey bee (*Apis mellifera*) .....48-h LD50, oral > 100 µg/bee 48-h LD50, contact > 100 µg/bee
- The penstock sample is part of the site's procedure LAB26.
- There is no legal requirement for the site to carry out the site drainage testing, this is done as good practice to review contamination within the site's surface water, in order to avoid contamination of the external environment.
- The site has been set no limits by its bespoke environmental permit regarding surface water discharge.
- Tebuconazole and Epoxiconazole are not manufactured on site, the product is manufactured at Cheminova in Denmark and shipped to site in IBC's. When on site it is filled into smaller containers in the Micronutrient Filling Department.

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- Headland filled 126,000 litres of Fungicide between 1<sup>st</sup> May and 9<sup>th</sup> June 2014 which is equivalent to 126 IBC's that were manoeuvred around the site during this period
- All Empty IBC's of Fungicide are placed in an external part of the yard area ready for a contractor to remove from site for IBC laundry.
- All cleaned baled waste plastic bottles are stored outside in the yard area awaiting collection from the recycling company.

### **Conclusion**

Potentially, there are several sources where a release of Fungicide could have occurred.

- A leaking IBC during unloading a HGV to the warehouse by Fork Lift Truck, although there have been no reports of any leak or spillage of a Tebuconazole or Epoxiconazole IBC reported to the HSE Department or Procurement and Logistics Department during this period.
- Or, as a result of a leaking Headland filled container during loading a HGV vehicle, again no reports of any leak or spillage of a Tebuconazole or Epoxiconazole container has been reported to the HSE Department or Procurement and Logistics Department during this period.
- Or, as a result of a clean down in the Filling department contaminated cleaning utensils which have been placed in the waste skip, during rainfall the contamination could have been washed out the dirty cleaning utensils/materials and onto the road surface eventually finding its way into the drains. During speaking to the Filling Deputy Manager and Filling Supervisor they hadn't noticed any spillages of Tebuconazole or Epoxiconazole and the waste is placed in waste liners and tied before placing in waste skips.
- Or, as a result of a contaminated filling bottle that had been emptied but not thoroughly cleaned and then had been baled as waste plastic ready for recycling. All baled empty plastic bottles are stored outside in the yard area, and during rainfall the material could have washed onto the yard area and then into the drains.
- Or, it could be as a result of placing the empty but contaminated IBC's outside in the yard area, ready for laundry collection, a small quantity of Fungicide could have been present on the external surfaces of the IBC's or the lids/caps etc. and again with rainfall this material could have washed into the drains.
- Lastly it is feasible on recently checking several IBC's waiting to be laundered that the base valve was not fully closed and the cap on the bottom had not been replaced correctly and therefore small quantities could have been dropped onto the road surface during transporting the nominally empty but still contaminated IBC to the external IBC Laundry collection area.

It is not possible to fully identify the actual source of the release, and there has been no reported spillage of fungicide material

The fortunate aspect of this incident is that the concentration of fungicide within the release surface water was found to be below any of the eco-toxicity levels prescribed within the material safety data sheets.

A Positive aspect to this incident is that the internal mechanism LAB26 for monitoring the site drainage water quality has worked and picked this incident up and that this has led to an investigation which is another part of the site's Environmental Management System.

### **Actions**

1. To communicate this incident to Natural Resources Wales - CRW
2. To consider building a covered/bunded IBC/Waste Storage area for dirty IBC's and contaminated packaging waste – CRW/CRB
3. To communicate to all filling department operators by way of a toolbox talk the importance of ensuring all external surfaces of all IBC's are clean, all lids are on tight and base valves are closed and capped before taking them outside – NP
4. To include in all applicable filling standard operating procedures the need to ensure all external surfaces of IBC's and other containers that are planned to be stored outside that they are clean, lids on tight and base valves closed and capped - NP
5. To arrange for the next site drainage release to be sampled and sent for external analysis to ensure there is no repeat of the fungicide material within the site drains.- MH
6. To communicate the new site drainage release results to Natural Resources Wales as well as this investigation report - CRW

**Investigation Completed by: Carl Rowe (HSE Manager)**

**Investigation Date: 27/06/2014**

