TOXIC CALENDAR 2021

6. The incident occurred during routine operation of the Phosphine Plant 'P1' when a welded steel bar ('rodder'), provided to prevent build-up of product in the transfer-line between the plant's convertor and reactor vessels, failed at the weld and broke in two. One piece of the rodder fell back into the vessels blocking the isolation valve in the transfer line whilst the other piece pulled clear of the vessels to leave a ~30mm diameter orifice in the convertor nozzle's stuffing box through which the dangerous substances escaped.

7. Other than the immediate vicinity of the plant no part of the site was evacuated. On-site fire fighters and West Midlands Fire Service (WMFS) attended the scene and a water-curtain was set up over the building to knock down the mist. West Midlands Police set up road blocks in the vicinity of the site to restrict public access to the area and advised local residents to stay indoors, and the Highways Agency directed traffic on the nearby M5.

January 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Outcome and Consequences

1. Rhodia reported that the substances released during the incident would be those normally present within the headspace of the reactor and the convertor, i.e. a mixture of phosphorus vapour, phosphine, nitrogen, hydrogen and steam.

2. Phosphorus and phosphine are both spontaneously combustible and would ignite upon contact with air to form phosphorus pentoxide. Whilst it is understood that the probability of phosphine ignition varies according to e.g. the presence of contaminants, there is no reason to suppose that anything other than negligible quantities of the phosphine and phosphorus vapour released failed to ignite and be converted to phosphorus pentoxide. The phosphorus pentoxide would be released from the fire in the form of very fine particles of fume which would react with moisture in the air to form a fine mist of phosphoric acid.

3. Rhodia stated that it is not possible to stop phosphine production from the reactor instantaneously and that the reaction continues for several hours after the phosphorus feed to the reactor is stopped. They also stated that in an emergency situation the reaction will continue even if the steam supply to the reactor is stopped.

February 2021

Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

"It's the stuff used in toothpaste"

March 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Above: Oldbury safety and environment manager Mike Peters (left) and safety officer Brian Jones (modelling one of the suits) check the new 'Proban'® cotton boiler suit after it has had liquid yellow phosphorus poured all over it (photo, left). When the phosphorus ignited, the suit charred without catching fire - so that anyone wearing it would have been fully protected. Mike believes the suit has 'real commercial possibilities.'

April 2021

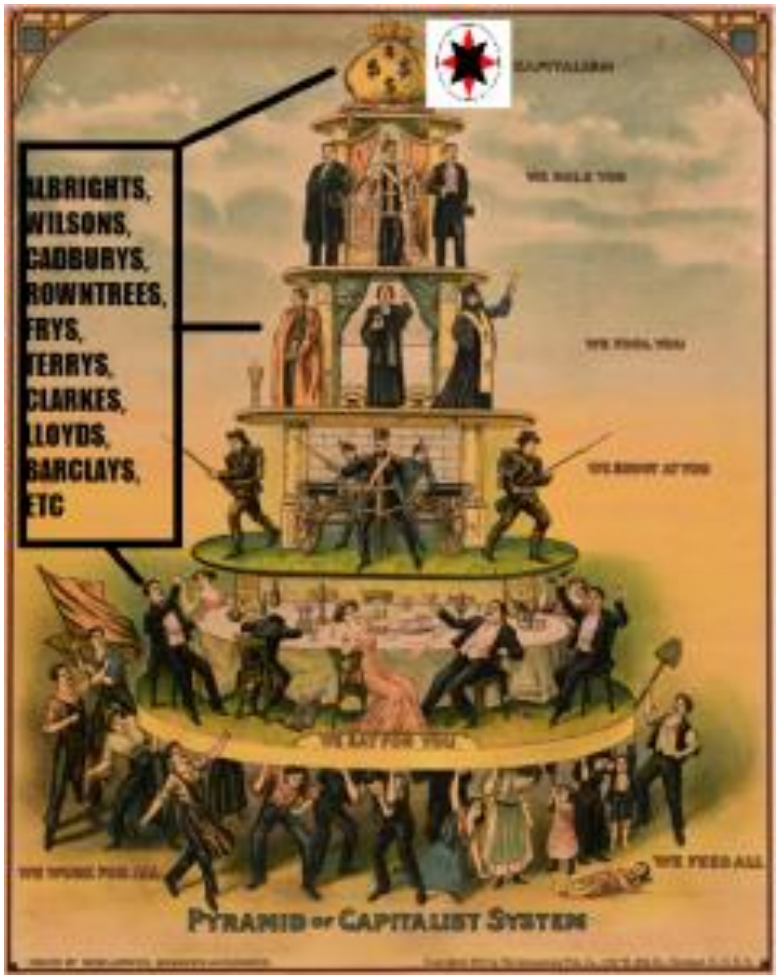
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

May 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

June 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			



July 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

August 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

September 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

October 2021

Mon	Tue	Wed	Thu	Fri	Sat	Sun
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
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25	26	27	28	29	30	31

LANDFILL SITE -

STATEMENT OF INTENTIONS, CONTD.

(vii) Methods of dealing with hazardous or difficult to handle types of waste.

The site is basically employed as a means of dealing safely with small quantities of Phosphorus, by a process of natural oxidation.

November 2021

Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	2	3	4	5	6	7
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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

The concentration of white phosphorus present in muscle, liver and kidney could not be measured as they were below the analytical limit of detection (LOD) of 5.89 µg/l. The concentration of white phosphorus present in intestine could not be measured as it was below the analytical limit of detection of 1.69 µg/l.

Comment
The analytical results show that the goose ingested a significant amount of white phosphorus and also confirms the presence of white phosphorus residue in fat tissue. This indicates that there is systemic exposure. Sparling, Day & Klein (1999) calculated the LD 50 of white phosphorus in swans to range between 1.40 to 4.68 mg/kg bodyweight (BW), with a mean of 3.65 mg/kg BW. The quantity

‡ - Test subcontracted; opinions given and interpretations of the result are outside the scope of UKAS accreditation.
† - Not UKAS accredited; opinions given and interpretations of the result are outside the scope of UKAS accreditation.
For further details of the test methods used, and other terms and conditions, please refer to the VLA Website.

detected in gizzard content (1.25mg/kg BW) is close to the LD 50. Geese are similar to swans in size and conformation so I would expect the LD 50 to be similar in both species of bird.

The autopsy failed to identify any other likely cause of death. The quantity of white phosphorus detected in gizzard and the presence of white phosphorus residue in fat tissue is consistent with white phosphorus poisoning as the cause of death of this goose.

Reference: Sparling DW, Day D & Klein P, 1999. Acute toxicity and sub lethal effects of white phosphorus in Mute Swans. Arch. Environ. Contamin. Toxicol. 36, 316-322

Jo Payne, Animal Health & Veterinary Laboratories Agency

December 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	