

From: [Wildlife](#)
To: [REDACTED]
Bcc: [REDACTED]
Subject: Wildlife Incident - Dead fox from Ty Llwyd Quarry, Ynys Ddu - W/23/05
Date: 12 July 2023 15:50:00
Attachments: [Redacted documents - W2305 - FERA toxicology report 10-23-signed.pdf](#)
[Redacted documents - W2305 - APHA PM report - 28 M0112 02 23-01.pdf](#)
[Redacted documents - W2305 - APHA PM report - 28 M0112 02 23-02.pdf](#)
[Redacted documents - W2305 - APHA PM report - 28 M0112 02 23-03.pdf](#)

Dear [REDACTED]

On the 14th of February 2012, it was reported that a dead fox had been found at Ty Llwyd Quarry. This incident was accepted into the Wildlife Incident Investigation Scheme (WIIS). WIIS makes enquiries into the death or illness of wildlife, pets and beneficial invertebrates that may have resulted from agricultural pesticide poisoning.

The fox was collected and a post mortem examination undertaken by one of our vets. This found the fox to be a female in good body condition but had not eaten well prior to death. She tested negative for avian influenza. The most significant finding on post-mortem examination was the large volume of red fluid in the thoracic cavity. Although there were no significant blood clots present, the fluid was dark red and appeared consistent with a haemothorax. In companion animals, haemothorax occurs most commonly secondary to trauma, coagulopathy and inflammatory conditions. There was no visible traumatic cause in this animal so it may be possible that this animal was suffering from a coagulopathy. Three circular lesions were also found in the left lung. Histopathology on the lung lesions revealed a bacterial bronchopneumonia and the circular lesions were abscesses. It is unknown whether the fluid in the thoracic cavity was linked to the bacterial infection in the lung or whether the two findings were unrelated. Copies of the post mortem results are attached.

Tissues from the fox were then sent to the analytical laboratory and tests for a range of likely pesticides have given a positive result for rodenticides. The tests detected and confirmed a residue of brodifacoum and bromadiolone in the liver of this fox. There were some haemorrhagic signs reported on post-mortem with no visible cause and together with the amount of brodifacoum found it is likely that this exposure to this pesticide contributed to the death of the fox. The bromadiolone residue is consistent with exposure level only. The source of the brodifacoum is unknown but it is likely to be from rodent control treatment in the area. No metaldehyde, carbamate, organochlorine or organophosphate residues were found. A copy of the toxicology result is attached.

We've recently reviewed this incident and have decided that since a cause of death (rodenticides) has been found, no further tests will be carried out.

Yours sincerely

The Wildlife Team



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Animal &
Plant Health
Agency

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Please click on the following link to access our online
Submission service:

<https://www.animal-disease-testing.service.gov.uk>

28/NE

APHA Ref. No. 28-M0112-02-23

Date Received 15/02/2023

**Submission details as supplied by the
customer**

Sender's Ref. W/23/05

Welsh Government (Aberystwyth)
Wildlife Management Unit
Rhodfa Padarn
Llanbadarn Fawr
Aberystwyth
Ceredigion
SY23 3UR
Email: Wildlife@gov.wales;

Previous Ref Not Given

Owner [REDACTED]

CPHH Not Given

Date of Sampling 15/02/2023

Case Vet [REDACTED]

Species / Breed Fox / Fox

Sex / Age Female / Adult

Samples Animal Presented Dead x 1

Animal IDs [REDACTED]

CC: [REDACTED]

Sub. Reason Project (VLA or Other)

REPORT 1 (FINAL)

The test result applies to the sample as received. A sub-sample of the item may have been tested where appropriate.

Wildlife Incident Investigation Scheme - APHA Report on samples received and examination performed.
Regional incident N° W/23/05.

Avian Influenza Helpline Ref: 020594.

HISTORY

A fox was found dead at [REDACTED]. The quarry was used by Monsanto for dumping PCBs and other chemicals in the 1960s and 1970s. There has been a recent problem with fluid leaking from the quarry. There were concerns that the fox may have drunk the fluid and been poisoned. The fox was collected by the police and delivered to APHA Carmarthen VIC on 15th February.

Location: [REDACTED]

Map ref [REDACTED]

GENERAL OBSERVATIONS

The fox was presented inside 3 red bags and then in a clear outer evidence bag with the following information:

[REDACTED]

Swabs were taken for surveillance testing for avian influenza on 15/02/23, and the fox was examined on 24/02/23 following negative AI results.

Identification	Sex	Crown anus length (cm)	Body Condition	Degree of Autolysis	Submitted Live/Dead/Frozen
Fox	F	60	Good	Moderate-Severe	Dead

NECROPSY FINDINGS

Musculo-skeletal system: There was an area of haemorrhagic oedema between the muscle layers overlying the thorax on the right-hand side.

Alimentary system: The left upper canine was missing and had fractured at gum level. There was red/pink fluid in and around the oral cavity. There were three dried leaves in the oral cavity likely to have entered after death. There was a small amount of blood-tinged fluid in the oesophagus. The stomach contained dark brown liquid and approximately three blades of grass. The small intestine contained orange-brown liquid. The large intestine contained scant brown-green content.

Respiratory system: There was a small amount of red/pink fluid externally around the nares. There was a very large volume of dark, red fluid in the thoracic cavity and one pale pink fibrin clot approximately 2cm in diameter. There were three circular lesions in the left lung. One in each of the cranial, middle and caudal lobes. The lesions varied from 0.5cm in diameter to 1cm in diameter with the largest being in the caudal lobe. The lesions contained white fluid. The circular lesion in the cranial lobe had a circular hole in the middle containing white fluid.

Urinary system: There were petechial haemorrhages on the serosal surface of the left kidney. There was patchy reddening of the entire bladder mucosa.

Nervous system: The corneas of both eyes were opaque.

All other organ systems examined were unremarkable. The endocrine system was not examined.

LABORATORY FINDINGS

Virology

Sample	Influenza PCR Overall Result
fox (Nasopharyngeal Swab)	No Influenza A viral RNA detected
fox (Rectal Swab)	No Influenza A viral RNA detected

Tissues retained frozen: Muscle, Stomach content, Liver, Kidney.

COMMENT

This young female fox was negative for avian influenza, results are reported above.

The most significant finding on postmortem examination was the large volume of red fluid in the thoracic cavity. Although there were no significant blood clots present, the fluid was dark red and appeared consistent with a haemothorax. In companion animals, haemothorax occurs most commonly secondary to trauma, coagulopathy and inflammatory conditions. There was no visible traumatic cause in this animal. It may be possible that this animal was suffering from a coagulopathy.

The cause of the lung lesions seen in the left lung lobes is not known. Tissues have been retained in fixative, but autolysis may limit the value of further testing.

The fox was in good body condition, but the lack of significant stomach and intestinal contents indicate that the fox had not eaten well prior to death.

The charge for this laboratory work is £0.00 plus VAT if applicable. This will be included in your monthly statement.

Service Charge Code(s):

Additional Service Code(s) performed: TC0004 x 1, TC0575 x 1, TC0691 x 1, TC0691 x 1, TC0691 R x 2

‡ - Test subcontracted; Opinions and interpretation expressed herein are outside the scope of our UKAS accreditation.
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§ - Accredited under Flexible Scope.
For further details of the test methods used, and other terms and conditions, please refer to the APHA Website.

The other findings in this case were non-specific. The corneal opacity was most likely a postmortem change.
Please let us know if samples should be submitted for toxicology.

Postmortem examination carried out and report written by [REDACTED]

Report authorised by [REDACTED]

[REDACTED]

28/02/2023

Awdurdodwyd ar gyfer e-bost.

Authorised for e-mail.

Free carcase collection service, for pre agreed Post Mortems that are of Surveillance value, is available in England & Wales - to check if this service is available in your area please go to:

<http://apha.defra.gov.uk/postcode/pme.asp>

Tell us what you think of APHA's laboratory testing and post mortem services and take part in our customer satisfaction survey. The survey is available in English and Welsh here:

https://defragroup.eu.qualtrics.com/jfe/form/SV_cugSVwY8ektZqzb

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Email: Carmarthen@apha.gov.uk

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28/TD

APHA Ref. No. 28-M0112-02-23

Date Received 15/02/2023

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Wildlife Management Unit
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Llanbadarn Fawr
Aberystwyth
Ceredigion
SY23 3UR
Email: Wildlife@gov.wales;
[REDACTED]

Previous Ref Not Given

Owner [REDACTED]

CPHH Not Given

Date of Sampling 15/02/2023

Case Vet [REDACTED]

Species / Breed Fox / Fox

Sex / Age Female / Adult

Samples Animal Presented Dead x 1

Animal IDs [REDACTED]

Sub. Reason Project (VLA or Other)

REPORT 2 (FINAL)

Histopathology †

PATHOLOGY REPORT 01

SAMPLES RECEIVED

Formalin fixed samples of lung from a fox that was found dead. Concern over exposure (consumption of) toxic chemicals, incl PCBs. Haemothorax and small white foci in lungs.

SUMMARY OF PATHOLOGICAL FINDINGS

Lung: four sections. poor preservation of tissue. across all four sections there is widespread haemorrhage into alveolar spaces, often accompanied by fibrin exudates that fill the alveolar spaces and are being organised and epithelialized. There are also large number of large foamy alveolar macrophages. In some areas there is intense infiltration of terminal airways and alveoli by degenerate neutrophils, along with necrosis and detachment of respiratory epithelium and cellular infiltration of airway walls. Two sections contain demarcated foci of tissue necrosis and fibrinous and leukocytoclastic debris, with small dense bacterial colonies. Fibrin and leukocytoclastic debris lines the pleural mesothelium in some sections also.

MORPHOLOGICAL DIAGNOSIS

Lung: marked, multifocal to coalescing, acute, necrosuppurative and fibrinous bronchopneumonia, with abscesses and bacterial colonies; widespread alveolar haemorrhage and fibrin exudation; and alveolar histiocytosis

COMMENT

There is bacterial infection of the lung (the white foci observed on gross examination appear to be small abscesses) but due to poor tissue preservation I cannot with any confidence determine whether this infection has arrived in the lung via the airways or haematogenously. There is also widespread alveolar damage, with fibrin exudation into the alveolar spaces. This is unusual, but I suspect it may be secondary to the bacterial infection. There is also an increased presence of large foamy alveolar macrophages. Whilst these might be part of the inflammatory process, I do wonder whether they reflect chronic passive congestion of the lung. Was there any evidence of cardiac disease on gross examination (eg valvular insufficiency, cardiomegaly)? Finally, whilst there is evident bacterial infection of the lung, I can't account for or explain the connection to the haemothorax recorded at PME. If the lung infection was embolic, it is possible that this resulted in vascular

injury and rupture. A general inflammatory state might also lead to a consumptive coagulopathy. However, it may be that these two findings are unrelated and the haemothorax is the result of trauma or coagulopathy by other means (eg rodenticide toxicity).

SUMMARY

A female fox was found dead at a quarry that was used for dumping PCBs and other chemicals in the 1960s and 1970s. There has been a recent problem with fluid leaking from the quarry.

At postmortem examination, a large volume of red fluid was found in the thoracic cavity and three circular lesions, varying from 0.5 to 1cm in diameter, containing white fluid, were found in the left lung.

Histopathology on the lung lesions has revealed a bacterial bronchopneumonia and the circular lesions are abscesses. The origin of the infection is unknown but one common possibility in foxes is bacterial infections due to bite wounds from other foxes. No convincing bite wound was found in this case, although there was an area of haemorrhagic oedema overlying the right side of the thorax.

It is unknown whether the fluid in the thoracic cavity is linked to the bacterial infection in the lung or whether the two findings are unrelated.

Samples have been sent for toxicology.

Summary written by [REDACTED]

[REDACTED]
Awdurdodwyd ar gyfer e-bost.
Authorised for e-mail.

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https://defragroup.eu.qualtrics.com/ife/form/SV_cugSVwY8ektZqzb

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Additional Service Code(s) performed: TC0004 x 1, TC0575 x 1, TC0691 x 1, TC0691 x 1, TC0691 R x 2

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28/TD

APHA Ref. No. 28-M0112-02-23

Date Received 15/02/2023

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Sender's Ref. W/23/05

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Rhodfa Padarn
Llanbadarn Fawr
Aberystwyth
Ceredigion
SY23 3UR
Email: Wildlife@gov.wales;

Previous Ref Not Given

Owner

CPHH Not Given

Date of Sampling 15/02/2023

Case Vet

Species / Breed Fox / Fox

Sex / Age Female / Adult

Samples Animal Presented Dead x 1

Animal IDs

Sub. Reason Project (VLA or Other)

REPORT 3 (SUPPLEMENTARY)

The test result applies to the sample as received. A sub-sample of the item may have been tested where appropriate.

LABORATORY FINDINGS

Virology

Sample	Influenza PCR Overall Result
fox (Nasopharyngeal Swab)	No Influenza A viral RNA detected
fox (Rectal Swab)	No Influenza A viral RNA detected

Primary Bacterial Culture

Sample	Bacteriology Result
fox (Thoracic Fluid)	Mixed flora containing a very heavy growth of <i>Streptococcus</i> spp.

Isolate Identification

Sample	Bacterial ID
fox (Thoracic Fluid - <i>Streptococcus</i> spp. - Culture Bacterial / Viral / Fungal)	<i>Streptococcus canis</i> spp.

COMMENT

Streptococcus canis is an opportunistic pathogen found in the skin, genital, and gastrointestinal tracts of healthy dogs and cats.



The charge for this laboratory work is £0.00 plus VAT if applicable. This will be included in your monthly statement.

Service Charge Code(s):

Additional Service Code(s) performed: PC0006 x 1, TC0004 x 1, TC0008 x 1, TC0010 x 1, TC0101 x 1, TC0102 x 1, TC0575 x 1, TC0575 x 1, TC0691 x 1, TC0691 x 1, TC0691 R x 2

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03/04/2023
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https://defragroup.eu.qualtrics.com/jfe/form/SV_cuqSVwY8ektZqzb

WILDLIFE INCIDENT UNIT

10/23



Original thinking... applied

WILDLIFE INCIDENT REPORT

INCIDENT NUMBER 10/23
PART OF STUDY WIIS23
REGIONAL NUMBER W/23/05
OTHER REFERENCES 28-M0112-02-23
SENDER APHA Carmarthen VIC
LOCATION [REDACTED]
GRID REFERENCE [REDACTED]
INCIDENT DATE 14 February 2023
SUSPECTED CAUSE OF INCIDENT brodifacoum unspecified
DATE OF REPORT 27 April 2023

REPORTING OFFICER [REDACTED]

SIGNED : [REDACTED]

NUMBERS AND SPECIES INVOLVED

1 fox

COPIED TO



Direct Phone Number 01904 462456

Fera Science Ltd.

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Sand Hutton, York, YO41 1LZ

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Original thinking... applied

Fera Science Limited, a company incorporated in England and Wales (registered number 9413107) whose registered address is at 65 Gresham Street, London EC2V 7NQ

WILDLIFE INCIDENT REPORT



Original thinking... applied

10/23

Samples received		Date received	Sample identifier
100889	fox	3/3/23	APHA: 28-M0112-02-23
100889	fox tissues	3/3/23	APHA: 28-M0112-02-23

Summary of field data

A fox has been found dead near a quarry by a member of the public. It was reported that in the 1960s and 1970s the quarry was used to dump PCBs and other chemicals. There has been a recent problem with fluid leaking from the quarry and the informant was concerned that the fox had drank this fluid and had been poisoned. The carcass was collected by a police officer and stored until it could be collected for transportation to the APHA. This is a rural area surround by woodland and several residential properties.

Summary of post mortem report

The dead fox was received for post-mortem examination within three red bags and a clear outer evidence bag : [REDACTED] It was a female fox, 60cm in length and in good body condition with moderate to severe autolysis. Nasopharyngeal and rectal swabs were taken for AI testing and no viral RNA was detected. There was an area of haemorrhagic oedema between the muscle layers overlying the thorax on the right-hand side. The left upper canine was missing and had fractured at gum level. There was red/pink fluid in and around the oral cavity. There were three dried leaves in the oral cavity likely to have entered after death. There was a small amount of blood-tinged fluid in the oesophagus. The stomach contained dark brown liquid and approximately three blades of grass. The small intestine contained orange-brown liquid. The large intestine contained scant brown-green content. There was a small amount of red/pink fluid externally around the nares. There was a very large volume of dark, red fluid in the thoracic cavity and one pale pink fibrin clot approximately 2cm in diameter. There were three circular lesions in the left lung. One in each of the cranial, middle and caudal lobes. The lesions varied from 0.5cm in diameter to 1cm in diameter with the largest being in the caudal lobe. The lesions contained white fluid. The circular lesion in the cranial lobe had a circular hole in the middle containing white fluid. There were petechial haemorrhages on the serosal surface of the left kidney. There was patchy reddening of the entire bladder mucosa. The corneas of both eyes were opaque. All other organ systems examined were unremarkable. The endocrine system was not examined.

Analysis : metaldehyde & carb (LC) analysis suite

100889	stomach contents	no metaldehyde & carb (LC) detected	detection limit	0.03	mg/kg
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Analysis : organochlorine analysis suite

100889	liver	no organochlorine detected	detection limit	0.2	mg/kg
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Analysis : organophosphate analysis suite

100889	stomach contents	no organophosphate detected	detection limit	1	mg/kg
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Analysis : rodenticide & chloralose analysis suite

100889	liver	brodifacoum	confirmed	0.68	mg/kg
100889	liver	bromadiolone	confirmed	0.011	mg/kg

Conclusion

It was suspected that this fox had been poisoned, although it appeared to have not eaten well prior to death. Laboratory analysis for a range of likely pesticides has been undertaken on the submitted samples and this included testing for organochlorine compounds due to the possible fluid leak from a nearby quarry. These tests have detected and confirmed a residue of brodifacoum and bromadiolone in the liver of this fox. There were some haemorrhagic signs reported on post-mortem of this fox with no visible traumatic cause and together with the amount of brodifacoum found it is likely that this exposure contributed to the death of this animal. However, the bromadiolone residue is consistent with exposure levels only. The incident has been assigned to unspecified use as the source of the brodifacoum is uncertain at present, but it is likely to be from rodent control treatments in the area.