Algal bloom wildlife post-mortem report

Government of South Australia
Department for Environment and Water

Species – Little penguin

Date collected –1 August 2025

Location – Hayborough, between Oliver's Reef & Dump Beach

History relating to the animal

One little penguin (*Eudyptula minor)* was found dead at Hayborough, between Oliver's Reef and Dump Beach on 1 August 2025.

Clinical examination

The animal was already dead and so could not be examined prior to death.

Necropsy

The necropsy (looking at the whole body) revealed that the little penguin was in good body condition and weighed 700g. There was moderate post-mortem autolytic change (decomposing after death). There was a puncture wound on the metatarsal joint (near the ankle) of the right leg, and a large full thickness (through all skin layers) wound on the right lower belly area. There were moderate amounts of sand within the coelomic cavity (space containing digestive tract and other organs). There was no inflammation surrounding the wound, indicating it likely occurred after death. The right kidney, reproductive organs and parts of the intestines were missing, likely due to predation. The right femorotibial joint (knee joint) was exposed and filled with sand, and the fibula (one of the shin bones) was fractured (broken) near the femorotibial joint (knee joint).

Tissues were collected for histopathology (looking at tissues under the microscope for more detailed information) and testing for brevetoxins and other algal biotoxins (a possibility due to the algal bloom).

Histopathology

Samples from every major body system were examined under the microscope. Examination of tissues revealed congestion (fluid build-up) throughout the lungs, moderate necrotising hepatitis (liver inflammation and areas of cell death) and oedema (swelling from fluid build-up) within the liver, inflammation within the kidneys (nephritis) and skeletal muscles (myositis).

Low numbers of bacteria were seen within the kidney (bacterial nephritis) and within the small blood vessels in the lung.

Brevetoxins

No samples were above the limits of reporting.

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Other algal biotoxins

No samples were above the limits of reporting.

Summary

One little penguin was found dead. Laboratory examination revealed inflammation in multiple organs (liver, lung, kidney and skeletal muscle). This is characteristic of a bacteraemia (bacterial infection within the bloodstream). This process likely contributed to illness and possibly caused the bird's death. Brevetoxins and other algal biotoxins were not detected.

Outlook

PATH RESULTS: LITTLE PENGUIN, (Wi) [redacted]

From [redacted]
Date Wed 06/08/2025 3:30 PM
To [redacted]

[redacted]

[redacted]

Tested on 05/08/25
Reported on 06/08/25 16:00
Referred on 01/08/25 **by:** [redacted]

Owner:
LITTLE PENGUIN
OLIVERS REEF
HAYBOROUGH 5211

Animal/s:
Wild Birds

DOB: N/A

Collected: 01/08/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received

[redacted]

CLINICAL HISTORY
Found between Olivers Reef and Dump Beef, Hayborough, SA. Collector - [redacted]

SAMPLES SUBMITTED
One Little Penguin carcass submitted, 0.7kg.

NECROPSY FINDINGS
Bird 1 = In front of Treleven Pl, Goolwa
The carcass is moderately autolysed. The bird weighs 0.7kg.
The bird is in good condition with adequate coverage over the keel bone.

There is a 7 x 5mm full thickness puncture wound on the metatarsal joint

of the RIGHT leg. The underling tendons and bones can be visualised. The wound is not associated with any gross evidence of inflammation.

There is a 2.7cm x 2.3cm round, full thickness, puncture wound on the RIGHT lateral ventral coelomic region. There is no gross evidence of inflammation or haemorrhage on the adjacent skin (likely post-mortem predation). The caudal coelomic organs can be visualised through this lesion.

There is moderate amounts of sand contamination within the coelomic cavity, which corresponds to the previously described lesion was at the RIGHT lateral ventral coelomic cavity. The RIGHT kidney, reproductive organs and part of the caudal intestines are missing (presumed predation). The gizzard is empty. The intestinal contents are brown and pasty.

The RIGHT femoral-tibial joint capsule is opened and filled with sand (likely secondary to predation). The fibula is fractured near the femoral-tibial joint (likely secondary to predation).

The remaining organs were thoroughly examined and do not have any gross abnormalities.

GROSS DIAGNOSIS
Moderate autolysis

[redacted]

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[redacted]

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OLIVERS REEF
HAYBOROUGH 5211

Animal/s:
Wild Birds

DOB: N/A

Collected: 01/08/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received
Post mortem predation

SAMPLES COLLECTED & TESTING
Tracheal and cloacal swabs in VTM - stored at Molecular Lab

Fresh tissues (liver, spleen, heart, kidney, brain, lung, trachea, intestines) - stored at -80

Fixed tissues - Histopathology

Comments
There is moderate autolysis and sand contamination, secondary to the likely post-mortem predation wound.
The cause of death is no apparent here. Please await histopathology results.

[redacted]
Veterinary Anatomic Pathology Diagnostician

Reviewed by:
[redacted]
Specialist Veterinary Anatomic Pathologist
[redacted]
6/08/2025

Validated by [redacted]

Outlook

PATH RESULTS: LITTLE PENGUIN, (Wi) [redacted]

From [redacted]
Date Thu 14/08/2025 3:30 PM
To [redacted]

[redacted]

[redacted]

Tested on 05/08/25
Reported on 14/08/25 16:00
Referred on 01/08/25 **by:** [redacted]

Owner:
LITTLE PENGUIN
OLIVERS REEF
HAYBOROUGH 5211

Animal/s:
Wild Birds

DOB: N/A

Collected: 01/08/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received

HISTOPATHOLOGY FROM NECROPSY

REF: [redacted]
ADDITIONAL FINDINGS 14/8/2025

CLINICAL HISTORY
Found between Olivers Reef and Dump Beef, Hayborough, SA. Collector - [redacted]

MACROSCOPY
Cassettes contain the following tissues
A: Heart, liver, skeletal muscle
B: kidney, air sacs, lung
C: small intestines (probably jejunum and ileum), proventriculus, trachea, oesophagus / crop, brain, lung
D: spleen, brain (including cerebellum, thalamus, optic lobe), lung, colon, air sac
E: brain (including cerebellum and optic lobe) ; Ae GK

MICROSCOPY
Skeletal muscle: Multifocally expanding the perimysium, replacing and effacing normal skeletal muscle are multiple foci of inflammation and necrosis. The inflammation is characterized by moderate numbers of plasma cells, small lymphocytes and lesser numbers of hererophils surrounding a central core of necrosis. The skeletal muscles affected are shrunken, hypereosinophilic and display loss of cross-striation.

Liver: Multifocally there is accumulation of mild proteinaceous fluid within the subcapsular space (oedema).
Moderate numbers of plasma cells and small lymphocytes with lesser numbers of heterophils are seen surrounding the periportal region. Rarely, the same inflammatory infiltrate is also seen located randomly, forming discrete nodules.

Heart: Multifocally the vessels are filled with moderate numbers of plasma cells and small lymphocytes with lesser numbers of heterophils and erythrocytes.

Kidney: Multifocally the cortical interstitium and the interstitium within the medulla are expanded by low to moderate numbers of lymphocytes and plasma cells.

[redacted]

[redacted]

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Owner:
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OLIVERS REEF
HAYBOROUGH 5211

Animal/s:
Wild Birds

DOB: N/A

Collected: 01/08/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received

Lung: There is moderate autolysis. Aside from this artifact, capillaries within the interstitium lining air capillaries are expanded by hyperaemia / congestion. Multifocally there are increased numbers of heterophils, plasma cells and small lymphocytes within the blood capillaries.

Trachea: There is moderate to marked autolysis with secondary autolytic sloughing of the epithelium.

Intestine (probably jejunum and ileum): There is moderate autolysis.

Brain: Multifocally the vascular lumen is filled with the previously described cells in heart. Rarely and mutifocally (predominantly in the cerebellum, microhaemorrhages expand Virchow's Robins spaces.

Those tissues not described are unremarkable.

DIAGNOSIS
Skeletal muscle: Multifocal, moderate, subacute, heterophilic and lymphoplasmacytic rhabdomyositis

Liver: Moderate, subacute, multifocal, periportal to random, heterophilic and lymphoplasmacytic necrotizing hepatitis with mild subcapsular oedema

Kidney: Mild, multifocal, subacute lymphoplasmacytic interstitial nephritis

Lung: Mild, multifocal, acute pulmonary hypermaemia / congestion

COMMENTS
The multi-organ inflammation is characteristic of a bacteraemia. Please contact the laboratory in the next 2-3 working days if bacterial culture of the liver is required.

The pulmonary congestion / oedema is likely an agonal process.
The rare microhaemorrhages in the brain are likely also agonal.

Report completed by

[redacted]

Tested on 05/08/25
Reported on 14/08/25 16:00
Referred on 01/08/25 **by:** [redacted]

[redacted]

Owner:
LITTLE PENGUIN
OLIVERS REEF
HAYBOROUGH 5211

Animal/s:
Wild Birds

DOB: N/A

Collected: 01/08/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received

[redacted] Veterinary Anatomic Pathology Diagnostician

and

[redacted]
Specialist Veterinary Anatomic Pathologist
[redacted]

MICROSCOPY 14/8/2025
Kidney: There are low numbers of Gram negative short rod bacteria within the inflammation. (Bacterial nephritis).
Fungi and yeasts are not seen on PAS stain and acid-fast bacilli are not seen on Wade Fite or Ziehl Neelsen stains.

Lung: There are rare Gram negative rod bacteria within the lumen of capillaries.

COMMENTS
There is evidence of a bacterial nephritis. This contributed to morbidity for the bird. Culture of pooled kidney and liver (in order to minimize costs) is recommended to assess if there is a dominant bacterial pathogen. The liver usually has the greatest chance of positive culture in cases of bacteraemia in birds. In this bird, bacteria are also in the inflamed kidney.

[redacted]
Specialist Veterinary Anatomic Pathologist

[redacted]

Validated by [redacted]

Tasmanian Government

ANALYTICAL SERVICES TASMANIA

18 St Johns Avenue New Town 7008 TAS
03 6165 3300
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www.analyticalservices.tas.gov.au

Submission Number: [redacted]
Report Number:
Issue Date: 6/02/2026
Status: Final

CERTIFICATE OF ANALYSIS

Customer: [redacted]
Address:
Contact:

Submission Description: Biotoxin and Brevotoxins
Sample Received Date: 11/12/2025
Contract Number:
Client Order Number: [redacted]
Program/Quote Reference: Biotoxin and Brevotoxins

Sample(s) analysed as received. Sampling date and time data supplied by the client. The document shall not be reproduced except in full.
Additional information relating to this submission can be found in the sample receipt notification.
This report supersedes any previous reports with this submission number.
Many tests specify a holding time which gives the recommended timeframe by which a sample should be preserved/extracted and/or analysed after the sample is taken.
Holding time information can be found on the AST website https://analyticalservices.tas.gov.au/our-services/containers-samples-and-submissions .
Whilst every effort is made to analyse samples within these timeframes, situations can occur where this is not possible.
Where a test has been conducted outside the recommended sample holding time this should be taken into account when interpreting results.

The results in this report were authorised by:

Name	*Position*	*Name*	*Position*
[redacted]	**Chemist**	[redacted]	**Section Head - Organic Chemistry**

Test Information:

Method ID	*Test Description*	*Date Commenced:*
3411	Lipophilic Toxins in Shellfish by LC-MS/MS	02-02-2026
3411A	Brevetoxins in Shellfish by LC-MS/MS	02-02-2026
3416	PST in Biota by LC-MS/MS (Boundy Method)	02-02-2026

Chemistry Test Results (Biota - Food)

		Sample Description	Brain	Intestine	Heart	Lung	Kidney	Spleen	Liver
		Sampled Date/ Time	05/08/25 0:00	05/08/25 0:00	05/08/25 0:00	05/08/25 0:00	05/08/25 0:00	05/08/25 0:00	05/08/25 0:00
Method ID	Analyte	Units	391387	391388	391389	391390	391391	391392	391393
	AZA1	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	AZA2	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	AZA3	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	Domoic Acid	mg/kg WMB	*IS*	<0.05*	<0.05*	<0.05*	<0.05*	*IS*	<0.05*
	DTX1 Free	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	DTX1 Total	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	DTX2 Free	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	DTX2 Total	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
3411	GYM	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	Homo-YTX	mg/kg WMB	*IS*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	OA Free	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	OA Total	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	PnTx-G	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	PTX2	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	SPX1	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	Total DST	OA eq. mg/kg	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	YTX	mg/kg WMB	*IS*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	Brevetoxin 1	mg/kg WMB	<0.10*	<0.10*	<0.10*	<0.10*	<0.10*	<0.10*	<0.10*
3411A	Brevetoxin 2	mg/kg WMB	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*
	Brevetoxin 3	mg/kg WMB	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*
	C1	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	C2	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	C3	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	C4	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
3416	dcGTX1	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	dcGTX2	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	dcGTX3	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	dcGTX4	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*

IS- Insufficient Sample

* NATA accreditation does not cover this result

Chemistry Test Results (Biota - Food)

		Sample Description	Brain	Intestine	Heart	Lung	Kidney	Spleen	Liver
		Sampled Date/ Time	05/08/25 0:00	05/08/25 0:00	05/08/25 0:00	05/08/25 0:00	05/08/25 0:00	05/08/25 0:00	05/08/25 0:00
Method ID	Analyte	Units	391387	391388	391389	391390	391391	391392	391393
3416	dcNEO	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	dcSTX	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	doSTX	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	GTX1	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	GTX2	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	GTX3	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	GTX4	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	GTX5	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	GTX6	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	NEO	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	<0.02*	<0.02*	*IS*	<0.02*
	STX	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	<0.01*	<0.01*	*IS*	<0.01*
	Total PST	STX.2HCl eq. mg/kg	<0.10*	<0.10*	<0.10*	<0.10*	<0.10*	*IS*	<0.10*

IS- Insufficient Sample

* NATA accreditation does not cover this result

Outlook

PATH RESULTS: LITTLE PENGUIN, (Wi) [redacted]

From [redacted]
Date Sat 23/08/2025 11:00 AM
To [redacted]

[redacted]

[redacted]

Tested on 05/08/25
Reported on 23/08/25 11:30
Referred on 01/08/25 **by:** [redacted]

Owner:
LITTLE PENGUIN
OLIVERS REEF
HAYBOROUGH 5211

Animal/s:
Wild Birds

DOB: N/A

Collected: 01/08/25 00:25 **Subm.No:** [redacted] **Lab No.:** [redacted]

Samples tested as received All Tests Complete

SUMMARY DIAGNOSIS
Multiorgan inflammation, including hepatitis, myositis and nephritis

SUMMARY COMMENTS
The multi-organ inflammation is characteristic of a bacteraemia. This likely contributed to morbidity and possibly caused the bird's death.

[redacted]
Specialist Veterinary Anatomic Pathologist
[redacted]

Validated by [redacted]