
**Progress audit of Biosecurity Queensland response activities at
Cawarral in August 2009**

Report prepared for

**Managing Director
DPI&F**

by

AusVet
(Nigel Perkins)

3 September 2009



AusVet Animal Health Services Pty Ltd
30 Plant ST, Toowoomba
Tel: 07 46320636 Mob: 0437935376
Email: nigel@ausvet.com.au
www.ausvet.com.au

Contents

Conclusions.....	4
Recommendations.....	5
Introduction.....	5
Terms of reference.....	5
Summary of Hendra cases	6
Human cases	6
Confirmed Hendra cases in horses at Cawarral	6
Case C1	6
Case C2.....	6
Case C3.....	6
Case C4.....	7
Initial involvement and Hendra confirmation.....	7
Incident response	9
Disposal of waste and infected material	11
Workplace health and safety.....	11
Communication and community engagement	13
Review of response activities.....	15
Initial response.....	15
Exposure risk for horses and humans	16
Information management.....	16
BQ procedures and preparedness.....	17
Communication with stakeholders.....	19
Workplace health and safety.....	19
Inter-agency contacts and activities	23
Appendix: Acronyms and abbreviations.....	24

Conclusions

At the time this report is written the response to confirmed cases of Hendra virus infection in horses at a property near Cawarral is continuing and involves a single infected premise (IP) and multiple trace or contact properties. There have been four cases of Hendra virus infection in horses including one horse where Hendra infection was inferred by subsequent confirmation that a veterinary practitioner was infected with Hendra virus following close contact with that horse while it was severely ill.

The private veterinary practitioner infected with Hendra virus has sadly died of the disease, becoming the seventh reported human case of Hendra virus infection and the fourth fatality. The private veterinary practitioner is likely to have been infected with Hendra virus while caring for a sick horse on the affected property several days prior to the BQ response.

Other people from the affected property and other private veterinary practitioners are being monitored by Queensland Health (QH) due to concerns over exposure to potentially infectious material. The most serious exposure risks are likely to have been incurred while staff were caring for horses infected with Hendra virus (cases C1, C2, C3) on the property prior to the BQ response.

Three horses died on the affected property on 28 July, 7 August and 8 August 2009. Biosecurity Queensland (BQ) staff were first notified of a suspect case of Hendra virus following the death of the third horse on 8 August 2009. Samples taken from this horse (case C3) tested positive for Hendra virus.

BQ officers responded rapidly and effectively to the initial notification of a suspect case of Hendra virus in case C3 and were attending the property within 1.5 hours of telephone notification to the QPIF Disease Watch Hotline. Quarantine was declared on the affected property on 8 August 2009 and biosecurity measures were implemented immediately to minimise any risk of further exposure of horses and humans to the virus.

At the time this report has been prepared surveillance of contact horses on other properties has not identified any evidence of spread of infection through movement of horses to other premises. Surveillance of in-contact horses remaining on the IP is continuing.

This report finds that the response activities being undertaken by BQ staff are in accordance with state and national plans and procedures and are being undertaken in a professional, timely and competent manner.

The role of all individuals involved in response activities is acknowledged with particular mention of all people who have been involved in activities on the affected property and who are managing human exposure risk to Hendra virus while providing care for horses on the property and undertaking biosecurity measures to ensure there is no further spread of virus.

The death of a private veterinary practitioner as a result of Hendra virus and exposure of additional people to potentially infectious material is a reminder of the risks to all people who work with horses and the need to implement appropriate precautionary measures designed to minimise the potential for exposure to virus.

A number of issues have been identified through this brief audit of response activities where there is potential for improvement of response preparedness, procedures and operations and in engagement of stakeholders in managing human health risk during response activities.

Recommendations

1. It is recommended that consideration be given to reviewing the level of support for Emergency Management Unit (EMU) activities to ensure that BQ staff receive adequate training and support to underpin response capacity.
2. It is recommended that Queensland Primary Industries and Fisheries (QPIF) work with QH and with other stakeholders including AVA/EVA and horse industry groups such as QHC to address broad concerns about WH&S and management of human health risk during activities associated with investigation of a suspect case of Hendra virus and during response activities once a Hendra case has been confirmed. It is acknowledged that many of these concerns involve management of issues related to human health that are not the responsibility of QPIF.
3. It is recommended that QPIF staff initiate a debrief with QH staff that covers issues arising from the Cawarral response including in particular communications between QPIF and QH, and joint activities involving staff from QPIF and QH during a Hendra investigation or response.

Introduction

This review was initiated in August 2009 and was directed at addressing one of the recommendations from an independent review of Hendra cases at Redlands and Proserpine in 2008 that had described a review or audit of DPI&F¹ procedures that may be performed by an individual independent of the response activities, with appropriate skills in response activities and procedures (such as EMU staff), and completed early in the operational phase of a response.

The process was purposefully designed to be brief in order to develop a report quickly that provided feedback on response activities. The process therefore was limited to consultation with those individuals directly involved in the early investigation and response at Cawarral and was limited to those activities and individuals associated with the infected premise and not other trace forward properties.

Terms of reference

1. Assess operating procedures and activities of Biosecurity Queensland staff involved in response activities associated with equine Hendra cases at Rockhampton in August 2009, with a particular focus on recommendations from the 2008 Perkins report. While the focus is mainly on Biosecurity Queensland's response, observations on the preparedness and response by the horse and related industries would be welcome to inform possible future preparedness activities with industry.
2. Present a report to the Managing Director, Biosecurity Queensland, by no later than 25 August 2009, including any recommendations for improvements to be made to the current response or built into arrangements for future responses.

¹ Now referred to as Queensland Primary Industries and Fisheries (QPIF)

Summary of Hendra cases

Human cases

A private veterinary practitioner infected with Hendra virus while examining a horse on the Cawarral property has subsequently died of the disease. Infection of the veterinarian appears likely to have occurred while the veterinarian was investigating a sick horse at the property on 27 July 2009. That horse died on 28 July 2009, several days before the first detection of Hendra virus in another horse on the property. The veterinarian was transported to a Brisbane hospital on 19 August 2009 and test results confirming Hendra virus infection were released on 20 August 2009. The veterinarian is understood to have died on 1 September 2009.

Additional people including the owner, other staff from the affected property and private veterinary practitioners who have had contact with the case horses, continue to be under observation by medical authorities at the time this report was prepared.

Confirmed Hendra cases in horses at Cawarral

There have been four cases of Hendra virus infection in horses at the Cawarral property at the time this report was completed.

Clinical signs and disease progression for the three horses that died on the property (C1, C2, C3) have been described in information released by the Acting Chief Veterinary Officer².

Case C1

Case C1 died on the property on 28 July 2009. The horse had been examined by a private veterinary practitioner on 27 July 2009 and the death of the horse was attributed to snake bite at the time. That veterinarian subsequently has been confirmed as having been infected with Hendra virus. The horse was buried on the property after it died and there were no samples available from the horse to allow testing for Hendra virus. The horse is considered to have been infected with Hendra virus based on the combination of clinical signs leading to death and the fact that the veterinarian who attended this horse has subsequently been confirmed as being infected with Hendra virus.

Case C2

Case C2 was a Shetland pony that died on 7 August 2009 and was buried on the property later that day.

The horse had been examined by a different private veterinary practitioner on 5 August 2009 and blood samples had been collected as part of the investigation of the pony's illness. The samples had been retained by the veterinarian and were provided to Biosecurity Queensland (BQ) during the first few days of the response to allow testing for Hendra virus. Those samples returned a Hendra positive test result by real-time PCR, confirming that the horse had been infected with the virus. The positive test result was announced on 14 August 2009.

Case C3

A horse that died on the affected property on 8 August 2009 after a short illness and that displayed signs consistent with Hendra virus.

BQ staff first attended the property on 8 August 2009 (soon after the horse had died) and performed a limited post mortem on this horse to collect samples for Hendra virus testing.

² http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/4790_14835_ENA_HTML.htm

The horse was then buried on the property in the same general location as the previous two horses that had died on the property.

A positive test result was reported on Monday 10 August 2009 and this horse then was the first case of Hendra virus to be confirmed on the property.

Case C4

One in-contact horse on the affected property was subsequently determined to have been previously infected with Hendra virus based on detection of antibodies in blood. Confirmation of the test positive status was released on 22 August 2009 and was based on positive results from a Hendra virus serum neutralisation test (referred to as SNT or VNT). The SNT/VNT is considered the definitive test for antibodies to Hendra virus, indicating previous exposure to the virus.

The horse had been reported to have developed a slightly elevated temperature (low 38s) in the first few days of the response and had returned a positive PCR test result on one sample collected on 11 August 2009 as well as negative PCR results on other samples collected either that day or the following day.

The horse was euthanased on Monday 24 August 2009 on the property and a post mortem performed by staff from the Australian Animal Health Laboratory (AAHL) at Geelong with assistance from BQ staff. The horse was buried on the property following the post mortem.

Initial involvement and Hendra confirmation

The initial notification to BQ of a suspect case of Hendra virus at a horse stud near Rockhampton occurred by telephone notification to the Disease Watch Hotline around 10:30 AM on Saturday 8 August 2009. Farm staff from the affected property had also made direct contact with a departmental staff member who lived nearby and that person contacted BQ Zone Leader, Capricornia, Animal Biosecurity and Welfare program, Mr Tim Farry, directly by phone to report the situation. Notifications described a horse that had died that morning on the property with signs consistent with Hendra virus and that there had been possible exposure of people involved in assisting the horse.

BQ veterinary officers from the Rockhampton regional office then were mobilised and were on site before 12:00 PM on Saturday 8 August 2009.

BQ officers also contacted two private veterinarians from the local area who had been involved in providing care for two horses that had died recently at the property. These discussions covered aspects of the suspect horse (C3) as well as the two previous horses that had died on the same property in the previous several days (C1 and C2).

On arrival at the property, BQ veterinary officers established an entry and exit area and put on personal protective equipment (PPE). A limited post mortem was performed on the horse and biological samples were taken from the horse. Blood samples that had been collected from the horse prior to death and were stored in a refrigerator on the property were also collected at that time by BQ officers.

The body of the horse was then moved using a bobcat and trayback vehicle that were already on the property, to a burial hole that had been dug the previous day. The burial hole was on

the property, and was in an area where other horses had been buried on the property, including cases C1 and C2 that had died on 28 July 2009 and 7 August 2009, respectively. A tarpaulin was used to prevent spillage of biological fluids during movement of the body to the burial site. Contaminated soil and discharge from the area where the horse had died was also disposed of in the burial site.

Veterinary officers then decontaminated equipment, vehicles, and the stalls and ground area where the horse had been that morning.

Veterinary officers worked with farm staff to develop and implement biosecurity procedures to minimise risk of spread of the virus. This included definition of an entry and exit location where farm staff and BQ staff would get into PPE to enter the part of the property where horses were housed (high risk area for disease control purposes), and where staff would then decontaminate and get out of PPE as they exited the dirty area. Equipment and consumables related to PPE and decontamination were left at the site for farm staff to use when entering the high risk area. Farm staff were advised that the property would be placed under quarantine that day due to the seriousness of the situation and that procedures would be reviewed once Hendra virus testing had been completed.

While still on the property the veterinary officers provided updates by telephone with the Zone Leader, Capricornia, Animal Biosecurity and Welfare program (Mr Tim Farry), who was in Rockhampton. The Zone Leader, Capricornia, Animal Biosecurity and Welfare program contacted staff at the Biosecurity Sciences Laboratory (BSL) to discuss the case and inform them that samples would be submitted for testing, Toll Priority to discuss options for managing biological samples in order to ensure timely transportation of samples to Brisbane for testing, and QH to provide an update on the situation and to ask that someone from QH contact the farm staff to provide support and advice on human health risks as a result of concerns over potential exposure by farm staff to biological material from the horse prior to and around the time of death. The Zone Leader, Capricornia, Animal Biosecurity and Welfare program also began to prepare Quarantine notices under the legislative authority of the Stock Act (1915) to apply to the affected property and an adjacent property that had a horse in a paddock that adjoined the affected property. A Biosecurity Inspector provided assistance in preparing the Quarantine notice and also registered the two properties on the QPIF Agricultural Property System (APS) that afternoon.

Discussions with Toll Priority indicated that samples would not be back from the property in time to be loaded onto a flight to Brisbane on that day (Saturday 8 August 2009) and arrangements were then made to ensure samples would be transported on the first available flight on the following day (Sunday 9 August 2009). Arrangements involved BQ staff packaging the samples appropriately and then Toll Priority were to arrange a courier to pick the samples up from the QPIF Regional Office at 10:30 AM on Sunday to transport to the Rockhampton airport.

The veterinary officers returned from the property to the Rockhampton Regional Office late on the afternoon of 8 August 2009 (after 5:00 PM) and shortly after that the Zone Leader, Capricornia, Animal Biosecurity and Welfare program, travelled to the affected property and the adjacent property to serve the Quarantine notices. At each of the two premises the visits involved face-to-face meetings with people on the property (farm staff at the affected property and property owner on the adjacent property) to discuss the contents of the Quarantine notice and the importance of complying with the notice. Additional information

and advice was also given to the owner of the adjacent property concerning the disease and response activities as well as management of the one horse on that property, and contact numbers for BQ staff. Quarantine signs were attached to the front fence or gate of both properties that evening.

Biological samples from case C3 were collected from the QPIF Regional Office in Rockhampton by a courier at 10:30 AM on Sunday 9 August 2009. Samples were expected to arrive at BSL at Yeerongpilly, Brisbane by about 3:30 PM that day and staff at BSL had been notified of the case and were prepared to process samples and complete real-time polymerase chain reaction (PCR) testing for Hendra virus exclusion that day. The samples did not arrive as expected and subsequent tracing revealed that the samples had in fact not been loaded onto the expected morning flight from Rockhampton to Brisbane but were loaded onto a later flight. Samples were then not expected to arrive at BSL until the evening of Sunday 9 August and a decision was made to perform testing the following day (Monday 10 August 2009).

The samples were processed and tested at BSL on the morning of Monday 10 August 2009 and a positive test result – confirming the horse had been infected with Hendra virus – was released around noon on Monday 10 August 2009.

Incident response

Confirmation of a positive Hendra test result triggered formalisation of an incident management team as defined in the Biosecurity Emergency Operations Manual (BEOM) with the incident manager being the Zone Leader, Capricornia, Animal Biosecurity and Welfare program of Biosecurity Queensland and the response team being drawn from regional staff and primarily staff based at the Rockhampton offices of QPIF.

A decision was made by Tuesday 11 August 2009 to implement a Local Control Centre (LCC) at the Rockhampton PIF offices in accordance with state and national plans and guidelines including BEOM and AUSVETPLAN. A staff member from EMU travelled to Rockhampton on Tuesday 11 August 2009 to assist in this process with particular focus on implementing appropriate systems and procedures to facilitate effective management of the response activities. The EMU staff member worked with the incident manager and other members of the incident management team to develop plans for a transition to the LCC structure. These included activities such as defining the structure and function of the LCC, developing a roster for each position, job descriptions, induction procedures, computer systems for management of documents and other records, role-based email accounts and various operational processes including daily meetings and incident action plans.

Initial response activities involved staff operating from offices within the Rockhampton QPIF complex and the first LCC situation report (Sitrep #1) describing response activities was released on Tuesday 11 August 2009. There was then a transition from a functional LCC that involved QPIF staff working largely from their own offices in the Rockhampton QPIF complex to a separate, stand-alone LCC that was set up in rooms within the DPI Conference Centre located on the grounds at the Rockhampton QPIF complex. The stand-alone LCC was fully operational by Friday 14 August 2009, meaning that all staff directly involved in the LCC activities were housed in a single shared room to ensure direct and simple communication and cooperation between staff performing different LCC functions. It is noted that LCC operations continued unabated through this transition period and the time required to set up the stand-alone LCC was mostly associated with setting up all of the infrastructure

within the designated LCC room including telephone and fax lines, intra- and internet capability for multiple computers, and installing computers and related equipment such as printers and photocopiers.

Response activities were initiated at the infected premise (IP) on 8 August 2009 and were increased following confirmation of the positive Hendra status of C3. Activities included implementation and enforcement of quarantine, assessment of the site including any hazards, providing information and support to the staff and the owner, compiling an inventory of animals on the site, tracing animal movements onto and off the infected premise over a defined risk period, and carrying out disease investigation and eradication activities as required. There was particular interest in further investigating the two horses that had died recently at the property and this involved discussions with private veterinarians who had attended these two cases and farm staff, as well as sourcing any biological samples that had been collected from the horses before they had died.

Initial investigations had revealed that two other horses had died on the property in recent weeks. The first (C1) had died on 28 July 2009 and had been diagnosed by an attending private veterinarian as having been bitten by a poisonous snake. Case records and information from the veterinarian and stud staff indicated that this horse had some signs similar to Hendra virus infection (temperature 41.1 centigrade, lungs noisy, rapid deterioration). A second horse (case C2) had died on 7 August 2009 and the death had been attributed to causes other than Hendra virus. Both horses had been buried on the property. Disinterment of these buried horses to collect samples for further Hendra testing was not considered likely to result in meaningful results and was not pursued.

Serum samples had been collected by the attending private veterinarian from the horse that died on the property on 7 August 2009 (C2) and these samples were provided to BQ staff during response activities. The samples were tested for Hendra virus and returned a positive result, indicating the horse had also been infected with Hendra virus. The positive test result was announced in an update released by the acting Chief Veterinary Officer (aCVO) on 14 August 2009.

There were no samples available from C1 (died 28 July 2009) but because of the possibility that this horse may have been infected with Hendra virus, tracing of movements on and off the property was conducted during the period from 21 days prior to the death of C1 (7 July 2009). This ensured that any horses that may have had contact on the property with any of the three dead horses, during a period prior to their deaths that was longer than the estimated incubation period of Hendra virus, would be traced and identified even if they had moved to another location in the period between 7 July 2009 and declaration of quarantine on 8 August 2009. Response activities therefore were designed from the beginning of the response to deal with all three deaths (C1, C2, C3) as possible Hendra cases even though there was only laboratory confirmation of Hendra virus infection in one horse (case C3) at the time the response was implemented. When subsequent evidence confirmed that both C1 and C2 were also Hendra positive, there was no need to change response activities since the response had already been based on the assumption that they may have been Hendra cases.

Tracing indicated that eleven horses had moved from the IP to eight other properties, including properties in the Rockhampton area, southern Queensland and one to a property in New South Wales. Additional properties were linked to the IP including properties where staff from the IP live and maintain their own horses. It is understood that all of these

properties have been placed under some form of movement control and that horses linked to the IP are under surveillance to ensure early detection of any signs that may be consistent with Hendra virus infection.

Sampling of in-contact horses on the IP was conducted by BQ officers and private veterinary practitioners on Tuesday 12 August 2009 and information released by the Acting Chief Veterinary Officer on 13 August 2009 indicated that all horses on the quarantined and trace forward properties had been sampled (blood and nasal swabs) for Hendra virus testing. Further testing of all horses on the IP and trace-properties are planned to ensure horses are free of Hendra virus before lifting of movement controls. Additional tests have been performed on horses following reporting of clinical signs that may be consistent with Hendra virus or to provide additional follow-up testing for some horses as a precaution following initial test results.

One horse on the IP has been reported to be sero-positive to Hendra virus based on a Serum Neutralisation Test (SNT) indicating that the horse has been infected with Hendra virus and has survived the initial infection. This horse had also returned a positive PCR test to an earlier sample. The horse was euthanased on Monday 24 August 2009 in accordance with the existing national policy and a post mortem was conducted on the horse by officers from AAHL with assistance from BQ staff.

Disposal of waste and infected material

PPE and discarded items of equipment or consumables are being placed into plastic bags designed for sealing hazardous waste (double-bagged) and then sealed bags are disinfected with Virkon and then transported by BQ staff back to the Rockhampton QPIF complex for disposal as hazardous waste. Discarded needles and syringes are being stored in sharps containers.

The three horses that have died on the property (C3, C2, C1) were all buried in one location on the property. The location has been inspected by BQ staff and has been assessed by staff from the Environmental Protection Agency (EPA) and has been deemed to be appropriate. Case C4 has also been buried at the same location following discussions involving the property owner, BQ staff and EPA staff.

General waste such as horse manure, bedding and uneaten feed has not been removed from the property.

Discussions have been held between BQ staff and the owner of the IP about cleaning and disinfection of the property and disposal of waste and planning is underway to conduct these operations once the disease is considered to be under control ie later in the course of response activities.

Workplace health and safety

All BQ staff involved in procedures at the IP and other nearby properties are understood to have received prior training in PPE and decontamination. Only a limited number of people have been involved in field activities requiring PPE (examination and sampling of horses for Hendra virus testing and other activities on the IP).

Formal induction procedures for BQ staff involved in all response activities have been implemented in the LCC. The reviewer was not made aware of any additional formal training in PPE and other biosecurity measures such as decontamination procedures that might have been conducted for BQ staff arriving at the LCC to take part in response activities.

Information on Hendra exposure risk and on biosecurity measures including PPE and decontamination and other measures designed to minimise human exposure risk have been provided to farm staff and private veterinarians who have been involved in activities on affected properties. This information is understood to be directly based on information contained in publications maintained by the QPIF (Hendra virus: Important Information for Horse Owners³, and Guidelines for veterinarians handling potential Hendra virus infection in horses⁴.

BQ staff have also provided equipment and consumables for use on the property including PPE and disinfectant for example. A set of instructions concerning entry and exit procedures has been posted at the entry/exit point to assist people in getting into and out of PPE as they enter and exit the high risk area.

BQ staff visit the affected property on a frequent basis (almost every day and often multiple times per day) and have provided regular assistance and advice to farm staff and private veterinarians on procedures for PPE and decontamination.

Farm staff have continued to have responsibility for ongoing welfare care of horses on the affected property including for example provision of feed, water, shelter and care for conditions not related to Hendra virus. A private veterinary practitioner has continued to provide routine veterinary care for horses on the affected property through arrangements conducted with the owner or manager of the property.

The private veterinary practitioner has also assisted BQ staff throughout the response in collecting health observations on horses on the property as part of ongoing monitoring and surveillance of in-contact horses for development of signs that may be indicative of possible Hendra virus infection. These activities may include visual observations of horses from a distance, observations on horses that have been caught and are being held by a handler, and collection of measurements of clinical parameters such as rectal temperature, heart rate, respiratory rate and gut sounds for example. The private veterinary practitioner has also assisted in response activities through collection of samples from horses on the affected property and on other properties for Hendra virus testing (blood samples and nasal swabs for example).

In some cases farm staff have also assisted in this process by catching and holding horses while the private veterinary practitioner or BQ staff have performed clinical observations or collection of samples. During the course of the response, three farm staff were admitted to hospital for treatment and monitoring and this has placed additional strains on remaining farm staff and the owner who have had to continue to provide for ongoing horse care for horses on the property. Discussions have been held with industry groups such as the Queensland Horse Council (QHC) to seek industry assistance in providing additional labour

³ http://www.dpi.qld.gov.au/documents/Biosecurity_GeneralAnimalHealthPestsAndDiseases/Hendra-virus-horse-owner-guidelines.pdf

⁴ http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/4790_13371_ENA_HTML.htm

to assist the farm staff in providing welfare care for horses and in general management of the property.

Where horses on the property are observed to be displaying clinical signs of illness that may be suggestive of Hendra virus infection, BQ advice to farm staff and to the private veterinary practitioner is understood to recommend that they notify BQ staff of the development and that farm staff and the private veterinary practitioner then avoid any form of contact with that horse. BQ staff would then be expected to investigate the horse and collect samples for further testing for Hendra virus. Farm staff are also instructed to minimise any contact with horses that have tested positive to Hendra virus.

Discussions have been held between BQ staff, the owner of the affected property and the private veterinary practitioner over balancing the various activities that must occur on the property. At times other agencies, groups and individuals have been involved in these discussions including QH and industry bodies such as QHC. The arrangement at the time this report was being prepared is understood to be based on the following activities and responsibilities:

- The property owner maintains responsibility for ongoing welfare care of horses on the property including provision of feed, water, shelter and health care for conditions unrelated to Hendra virus. Farm staff are understood to be responsible for daily tasks related to these responsibilities with assistance being provided by industry through arranging for additional people to help in these tasks. Farm staff are instructed to minimise contact with horses during these tasks.
- If any horse on the property requires veterinary care for conditions that are considered to be unrelated to Hendra virus, then such activities are the responsibility of the property owner as the owner of the horse (or agent for the owner of the horse) and a private veterinary practitioner engaged by the property owner.
- Daily monitoring and surveillance of horses on the affected property for signs that may be suggestive of Hendra virus infection, and collection of any samples for Hendra virus testing, are the responsibility of BQ staff though other individuals may assist BQ staff in performing these activities. A private veterinary practitioner has been employed by BQ to provide assistance with these activities.

Communication and community engagement

A media release from QPIF on 10 August 2009 contained information describing an investigation of a suspect case of Hendra virus that was proceeding at a site near Cawarral approximately 20km east of Rockhampton and that testing was proceeding on samples taken from a horse at the property⁵. A second release later that day reported that tests had confirmed that samples from the horse had returned a positive test result for Hendra virus⁶.

It is understood that notifications of the positive test result were completed in accordance with BEOM and included notifications to the owner, private veterinary practitioner, horse industry stakeholders and veterinarians and other individuals who have subscribed to receive email updates on animal health and disease alerts. A large number of notifications are defined in the BEOM including the relevant Minister and Associate Director-General, senior staff

⁵ http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/30_14756_ENA_HTML.htm

⁶ http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/4790_11602_ENA_HTML.htm

within QPIF and in other related agencies such as QH, WH&S, Chief Veterinary Officers in other jurisdictions, and the Australian Animal Health Laboratory (AAHL) at Geelong.

Inter-agency communication between BQ staff and QH staff have occurred throughout the response to date and have involved emails, phone calls and meetings at different levels. QH was initially alerted by phone on Saturday 8 August 2009 while the two BQ veterinary officers were performing their initial investigations and collecting samples from case C3. The initial communication involved notification of a suspect horse case that was associated with possible human exposure. Following confirmation of a positive Hendra result there were direct communications between senior BQ staff and senior QH staff in Brisbane as well as QH staff in regional offices at Bundaberg and Rockhampton. There have been daily telephone updates involving the LCC controller from BQ and local QH staff from Rockhampton and a range of other teleconferences and meetings involving staff from the two agencies.

There has been a great deal of effort directed by QPIF staff at both responding to requests for information on the response and on Hendra virus from the community and from veterinarians, and at more strategically addressing community information concerns in a pro-active manner. These have involved QPIF staff dealing with large numbers of incoming calls through the QPIF Business Information Centre (BIC) that manages telephone contact for all departmental enquiries and through phone calls coming directly into the Rockhampton QPIF offices. In addition a Community Engagement team is being managed within the LCC and is dealing with local enquiries as well as managing visits to individuals or properties in the response area. Community engagement staff have also attended local shopping centers and other community events or locations to provide information for the community. Some of these visits involve the QPIF Mobile Office (a large bus clearly labeled with QPIF logos) and the movements of the Mobile Office are advertised locally to ensure community members have an opportunity to visit the bus and collect information or ask questions. A number of these local activities have involved BQ staff working together with QH staff to address concerns about either horse or human health.

Advertisements containing information about Hendra virus and contact details for BQ services have been placed in a number of newspapers including the Courier Mail, Rockhampton Morning Bulletin, Biloela Central Telegraph, Blackwater Herald, Capricorn Coast Mirror, Emerald Central Queensland News, Gladstone Observer, Rockhampton and Fitzroy News.

Information relating to the response has been released regularly through media releases, and interviews.

A great deal of information has been mounted on the QPIF web site⁷ throughout the response including media releases and communiqués or updates for veterinarians and other horse industry stakeholders.

⁷ http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/27_2900_ENA_HTML.htm

Review of response activities

Initial response

An investigation was triggered as soon as the initial notification of a suspect case of Hendra virus in a horse was received on the morning of Saturday 8 August 2009.

There were concerns about the horse that had died that day (Case C3) and about the fact that two additional horses had died in recent days (Cases C1 and C2). There were also concerns about the possible exposure of people and veterinary practitioners to biological material from these cases that may have been associated with exposure to Hendra virus.

BQ veterinary officers immediately prepared to visit the property and were on-site at the affected property within 1.5 hours to perform a limited post-mortem and collect samples from the horse for Hendra virus testing. The BQ officers also assisted in the burial of the horse, decontaminated vehicles and equipment and the area where the horse had died. Advice was given about biosecurity measures including PPE and disinfection/decontamination and about avoiding or minimizing exposure risk. QH staff were notified of the events. Staff were advised that the property would be placed under quarantine and a written quarantine notice under the Stock Act (1915) was subsequently served later that afternoon.

There were delays in transporting samples from Rockhampton to Brisbane. Samples were picked up by a courier at a pre-arranged time but were apparently not loaded onto the expected departing flight at Rockhampton airport. Samples were then loaded onto a later flight meaning that they would then arrive at BSL in Brisbane sometime in the evening of Sunday 9 August 2009. The flow on effect of this was that testing was not performed until Monday morning and results were therefore delayed by up to half a day. The delays were due to factors outside the control of QPIF and did not have any effect on the response or on initiation of appropriate quarantine and biosecurity measures on the affected property since all of these initiatives had been implemented during the initial site visit by BQ staff. Delays from sample collection to reporting of results are an inherent component of every response and are likely to be longer for investigations that occur in more remote regions of Queensland. It is important that appropriate biosecurity measures be implemented immediately if there are concerns about possible Hendra virus infection and that these measures be continued until such time as test results are obtained and then modified if necessary based on the test results. The BQ officers involved in the initial response are acknowledged as having responded rapidly and effectively to investigate the suspect case and implement quarantine and biosecurity measures because of concerns over Hendra exposure risk.

The initial investigation was managed as a veterinary investigation within the regional centre. The fact that the response was geographically close to a major regional QPIF complex meant that there were a number of staff from the Rockhampton offices who were able to initiate the response immediately including both the first visit and veterinary investigation and other early response activities, particularly tracing and initial assessment of the affected property following confirmation of Hendra infection.

A decision was made within QPIF to escalate the scale of the response from an investigation or incident response managed within routine operations of the regional centre to implementation of a LCC structure under an emergency response arrangement as described in AUSVETPLAN documents. The structure and functions described under the AUSVETPLAN

documents for State Control Head Quarters (SCHQ) were implemented within QPIF offices in 80 Ann Street, Brisbane. The decision to implement a LCC structure locally was made in discussion between senior staff at 80 Ann Street, Brisbane and the Zone Leader, Capricornia, Animal Biosecurity and Welfare program, and included consideration of factors such as the exposure risk for people, possibility of multiple horse cases, number of horses on the affected property, number of possible horse movements on and off the property and the fact that the property included horses owned by people other than the owner of the property.

The decision to move to a LCC structure was made by Monday night (10 August 2009) and then implemented over the next few days. There are a range of flow-on effects of this decision including ability of the Zone Leader, Capricornia, Animal Biosecurity and Welfare program to authorise additional actions and expenditure including extended and after hours work activities, and seek BQ staff from other regions to help populate a roster of positions required within the LCC. There are smaller effects as well such as facilitation of LCC set-up activities including development and implementation of role-based email accounts and an intranet directory structure that is built as per response plans to allow central document storage, tracking and ease of retrieval of information.

The early decision to implement a LCC structure is strongly supported and is acknowledged as contributing to the rapid implementation of an effective response structure. This decision was facilitated by the tasking of an EMU staff person to help in setting up systems and procedures during the first few days of the response and this is also strongly supported as an effective means of ensuring that proper systems, structures and procedures were implemented early in the response.

Exposure risk for horses and humans

The private veterinary practitioner infected with Hendra virus appears to have been exposed to virus while attending a sick horse (Case C1) on the property. The events that are likely to have resulted in infection of the veterinarian occurred prior to initiation of the BQ response.

The occurrence of a human case of Hendra virus infection reinforces the risks borne by veterinarians and other people who interact with horses, and the need for all individuals who work with horses to assess risks of exposure to infectious agents such as Hendra virus and to take precautions where appropriate. More detailed information about exposure risks and management options to reduce exposure risk are contained within documents available on the QPIF website, most notably the guidelines for veterinarians.

Information management

Data and information relating to horses on the affected property and horses traced forward to other properties, are currently being entered into a variety of different programs and particularly Excel spreadsheets, Word documents and PDF files. There are difficulties in access to and sharing of information and in linking disparate data sources that may relate to the same event or property or horse because of the lack of a single, information management system and the resultant ad hoc use of different files and programs. In some cases it may be difficult to access and retrieve relevant information about a particular event for example epidemiological information about potential exposures and contacts for a particular animal or premise that may be located in different word or spreadsheet files.

AUSVETPLAN documents describe the Animal Emergency Management Information System (ANEMIS) software as a record based computer program designed to store and

retrieve information about disease control activities carried out at a local disease control centre (LCC). ANEMIS can be implemented as a central system capable of being accessed and used by both LCC and SCHQ staff. It can store all information concerning a premise and also be used to record and manage or allocate resources such as staff who are conducting field visits or property inspections. During the equine influenza (EI) outbreak in Queensland in 2007, ANEMIS was not functional and instead a customised information system was developed during the early EI response, called the Equine Influenza Information System (EIS), to manage information and records during the response.

A new computer application is under final stages of development and is understood to have been implemented in some form in selected states in Australia. The application is being developed under the direction of the Primary Industries Ministerial Council with the full support of all States, Territories and the Commonwealth and is called BioSIRT (Bio-security, Surveillance, Incident Response and Tracing). It is intended that BioSIRT will be used by each jurisdiction for managing emergency and routine incidents of disease, pests or incursions. The use of a single application suite across all states and territories and for both routine incidents as well as emergency responses is purposefully intended to ensure staff are familiar with the system (they will use it all the time and not just in an emergency response) and to facilitate sharing of information and collaboration between jurisdictions in a coordinated response that crosses state or territory boundaries. BioSIRT has been assessed to be suitable to operate in the QPIF information technology environment, and an implementation plan that includes placing BioSIRT in a production environment, and provision of associated training in the use of BioSIRT, is currently being implemented. It was determined that implementation was not sufficiently advanced to use BioSIRT for this response.

The relatively small scale of the Hendra response at Cawarral (one IP and a limited number of traced or contact properties) means that ad hoc information management as is currently being employed in the LCC, is not having an appreciable adverse effect on the response. The current method is relatively inefficient and does mean that BQ staff spend additional time in retrieving relevant information and linking disparate records to a particular event or animal (in comparison to expected efficiency gains if a fully integrated information management system such as BioSIRT were operational). In a larger scale response the impact of the lack of a functional information management or emergency response management system is considered likely to be more substantive.

BioSIRT is being implemented in Queensland as a management system capable of being used for both routine and emergency response management. The benefits of implementation of BioSIRT encompass all activities of QPIF and are far broader than just Hendra response preparedness or capability.

BQ procedures and preparedness

The actions of BQ staff in responding to the positive diagnosis of Hendra virus infection in horses at Cawarral are considered to be in accordance with national and state operating procedures including for example:

- AUSVETPLAN documents:
 - Provide guidelines at the national level on policy, strategies, implementation, coordination and emergency-management plans, as well as disease specific policies.

- Biosecurity Emergency Operations Manual (Current Working Draft dated 13/03/2009):
 - State-level operations plan for emergency animal disease response in Queensland.
- Respiratory Management Program: For zoonotic disease investigation and responses, chemical sprays, volatile or oxygen replacement gas exposures. (Version 1.0, February 2009).
- Guidelines for veterinarians handling potential Hendra virus infection in horses (Version 3, April 2009)
- SOP for Personal protective equipment and personal disinfection for zoonotic diseases (Draft, 6/08/2008)
- Material safety data sheets (MSDS) for all chemicals that may be used during response activities

Policies, procedures and related documents are stored within a central repository and are available for viewing, searching and retrieval from an intranet portal capable of being accessed by any computer that is authorised and connected to the QPIF intranet. However, relatively few staff have received training to date in the use of the portal. In addition there are concerns even amongst staff that have received training that the portal is not very easy to use and that particular documents relating to Hendra response activities for example may not be easy to identify or locate and retrieve.

EMU staff are understood to have roles including preparedness and support, and are involved in the revision and development of operating procedures, guidelines and general preparedness for emergency disease responses. EMU staff are also responsible for development and management of training as part of preparedness. It is understood that limited training related to response preparedness has been delivered to BQ staff in the past 12 months and that this has been focused on foundation training. Foundation training provides more of an overview of national and state plans and procedures and general principles concerning management of a response. Foundation training then needs to be accompanied by functional training that is more role-specific and that can go into more detail about the functions of various positions and roles within a response structure. In some cases functional training may require staff to work under simulated conditions in an exercise to ensure that there is role-specific training that provides conditions, and data/information flows that reflect real-world challenges and situations. Budget constraints have limited the resources available for EMU and have consequently limited the amount of training in disease response activities that has been available for BQ staff. There has been no functional training in the past 12 months. Staff do receive experience in response activities through regular BQ investigations and responses, including activities such as the Hendra virus responses in 2008 and the equine influenza outbreak in 2007.

Training in infection control, PPE, respiratory management and decontamination procedures have been delivered to BQ staff in the south east of the state and in the central region. People attending these training workshops have included private practitioners, BQ staff, and people from other agencies.

There is a need for sufficient resources to be directed at EMU activities to allow for review and development of appropriate and relevant procedures and plans for response activities and to accompany these with training activities to ensure BQ staff continue to be familiar with response plans, the general structure of a response (LCC), and with particular role-based functions within the LCC. Training needs will be impacted by the expected implementation

of a new information management system (BioSIRT) described in the previous section of this report.

While acknowledging that recent developments in Australia and the rest of the world have presented serious challenges to state and federal budgets and resulted in budget constraints across many government activities, it is the view of the reviewer that inadequate resources are currently being directed at the critical training, support and preparedness functions that underpin response capacity and that are largely the responsibility of the EMU. It has not been possible given the time constraints of this brief review to attempt to define the needs, outputs or resources required to address this issue.

It is recommended that consideration be given to reviewing the level of support for Emergency Management Unit (EMU) activities to ensure that BQ staff receive adequate training and support to underpin response capacity.

Communication with stakeholders

There is a high level of concern and interest in information from a wide spectrum of community groups. The level of interest is understandably very high in the local community and also within related sectors of the horse industry including equine veterinarians for example.

A great deal of effort has been directed at communications and community engagement throughout the response. These activities have been described in earlier sections of this report and are acknowledged as providing important, timely and relevant information to stakeholders about Hendra virus and about specific response activities.

Workplace health and safety

The reviewer has become aware during the process of preparing this report of a degree of uncertainty amongst stakeholders about various responsibilities for Workplace Health and Safety (WH&S) and in particular for managing human exposure risk to Hendra virus on an IP. The term IP is used to refer to a property that is under quarantine orders authorised by relevant state legislation (Stock Act 1915) relating to control of Hendra virus. There is understandably a very high level of interest amongst people directly affected by the response about management of human exposure risk during response activities.

Occupational Health and Safety obligations are defined in the Workplace Health and Safety Act (1995) and associated Workplace Health and Safety Regulation (2008).

It is understood that an employer has a duty of care to employees and other persons who enter the workplace. Actions in relation to WH&S may be assessed against specific standards or codes of practice where they exist, or against more general scientific knowledge and safe practices in order to ensure that adequate safeguards are taken to prevent risks to health and safety.

For Hendra virus, the guidelines for veterinarians contain specific information on WH&S precautions that are intended to be implemented when an investigation proceeds or where there is contact with known Hendra virus cases. The information in the guidelines for veterinarians is complemented by additional details in QPIF operating procedures such as those that have been identified in previous sections of this report. The information in the

guidelines for veterinarians and related operating procedures is considered appropriate for workplace health and safety requirements for QPIF officers.

However, there appears to be uncertainty over the range of obligations and responsibilities that may exist on a premise that is under quarantine due to Hendra virus. There are a range of activities that may be expected to be occurring on an IP including for example:

- People may be living on the property and coming and going as part of normal daily activities.
- Routine farm operations that are not directly related to activities associated with a Hendra virus response but that may be occurring on the same premise.
- Activities associated with routine care of horses on the property including provision of food, water, shelter and health care for conditions that are not related to Hendra virus.
- Activities directly associated with Hendra virus including monitoring and surveillance of in-contact horses for signs that may be suggestive of Hendra virus, sampling of horses (or other animals or environment) for Hendra virus testing, and specific activities involving highly suspect or confirmed positive cases such as euthanasia and post-mortem examination.

In some cases it is not easy to clearly distinguish activities for example when a farm staff member is feeding and watering horses they may also be observing animals for signs suggestive of Hendra virus and may be asked on occasion to hold a horse for someone else (BQ inspector or a private veterinary practitioner) to examine a horse more closely.

During response operations being undertaken on the affected property at Cawarral there are a range of people entering the property and a subset of these people who then enter the high risk area. These may include the farm owner, farm staff employed by the owner, horse owners of those horses that may be agisted or housed on the farm, private veterinary practitioners working for the farm owner or another horse owner, people assisting in provision of welfare care of horses on the property who are not necessarily employees of the farm owner, private veterinarians working on the property under contract to BQ, BQ staff and other people such as QH staff.

WH&S obligations and responsibilities for activities that may be undertaken on the affected property are understood to depend on the particular activities being performed, the source of supervision or instruction concerning activities (farm owner vs BQ inspector for example), and who is involved in actually doing the activities.

During the course of an investigation and response, BQ provides a great deal of information to people on the IP about Hendra virus, biosecurity measures and about managing exposure risk. In the current response BQ have imposed quarantine on the IP, assisted the farm staff in defining clean and contaminated or high risk areas and developing an entry and exit point where biosecurity measures must be undertaken by anyone entering the high risk area (getting into PPE for example) and as people exit the high risk area (decontamination and getting out of PPE). BQ staff have provided equipment, consumables, advice and assistance for farm staff and others who enter the high risk area. However, these actions by BQ staff are understood to be based on the legislated responsibilities of BQ staff associated with control of an animal disease.

During the course of a response, farm staff and other people such as private veterinary practitioners continue to have responsibilities that necessitate entry into the high risk area and particularly activities associated with provision of welfare care for horses (feed, water, shelter and health care for conditions unrelated to Hendra virus). These people have every reason to be concerned about management of human health risk while undertaking these activities and may be expected to seek information, assistance and instruction on what may be safe or unsafe and how to go about entering and exiting the high risk area and completing tasks within the high risk area. There are limitations to the involvement of BQ staff in providing this support since there are a range of activities that occur on the IP that are not directly related to the legislated responsibilities of BQ in controlling the animal disease. Such activities may involve WH&S obligations and responsibilities that are being borne by people not associated with QPIF (property owner, farm manager, private veterinary practitioner and other individuals for example).

There is a considerable amount of information contained within the Guidelines for Veterinarians that relate to WH&S and management of human exposure risk. However, it is not always easy to distinguish responsibilities from reading that document. There are occasional sections of text in the guidelines that appear to be implying that BQ will assume responsibility for WH&S. For example the following text appears on page 14 of the guidelines:

“If Biosecurity Queensland places a property under quarantine for HeV, that property becomes a workplace of Biosecurity Queensland. Biosecurity Queensland will work closely with the owner/manager to undertake the WH&S responsibilities while the property remains under quarantine and will determine what activities take place on that property. For all other non-quarantined properties, WH&S responsibilities remain with the owner/manager/carer and with the private veterinary practitioner and Biosecurity Queensland if they enter the property in a business capacity⁸.”

There is a need for clarification of the various WH&S obligations and responsibilities of people who may be involved in activities on an IP, and most particularly for those activities that may be unrelated to the control of Hendra virus. In the case of obligations and responsibilities for people who are not QPIF employees (farm owner, farm staff, private veterinary practitioners, industry labour), there appears to be a need for provision of advice and support to assist individuals to realise their responsibilities and to manage their own conduct to ensure minimisation of exposure risk or of other adverse events.

It is also important to recognise that many of the concerns noted by the reviewer in relation to this issue are understood to be related to WH&S responsibilities that may not be the responsibility of QPIF and are instead considered more likely to be the responsibility of other individuals including the property owner, farm staff and private veterinary practitioners.

The issue is considered to be best approached as a shared responsibility. There are potential roles for industry groups such as QHC to provide assistance in the development of advice and support for horse owners or property owners. There appear to be similar opportunities for other peak groups to provide support to their members such as the Australian Veterinary

⁸ Page 14, Guidelines for Veterinarians handling potential Hendra Virus infection in horses, Version 3, April 2009. http://www.dpi.qld.gov.au/cps/rde/dpi/hs.xsl/4790_13371_ENA_HTML.htm

Association (AVA) for private veterinary practitioners. There also appears to be a role for QH staff in providing information and support for decisions about managing human health risk on the property. Support activities may extend to development of a generic framework that may be applied on a particular property to allow the property owner to assess risks and develop a strategy for managing routine operations and ongoing horse care during a response.

It seems logical and important that BQ be involved in this process as well for two broad reasons: the first is because of the legislated role of BQ in managing the animal disease response and the second is the fact that much of the knowledge about the disease and about biosecurity measures such as PPE and decontamination that may be applied to reduce disease risk can be sourced from BQ staff or BQ information. There may also be public good or market failure justifications mounted for involvement of BQ in this process.

An important outcome of this process is the development of contingency plans including WH&S considerations by (or for) individuals such as property owners, horse owners and private veterinarians for how they may manage day-to-day operations in the event of a suspect or confirmed case of Hendra virus occurring on their premise or in their workplace. Some outcomes and information may be incorporated into the guidelines for veterinarians or information for horse owners. However, it may also be appropriate for information to be developed and provided through other agencies or bodies since an important part of this process is to provide support for individuals to assess risk and manage activities on properties that are not directly related to Hendra surveillance or control and that are not the responsibility of QPIF. It is also expected that this process should also result in additional detail and clarification on how various activities on an IP may be managed and in particular which activities might be considered to be the direct responsibility of BQ and which activities might be considered to be the direct responsibility of farm owners or staff or other people.

Finally, this issue appears likely to involve activities in two different situations. The first is involves preparedness and development of plans and procedures for managing WH&S on properties that have either suspected or confirmed cases of Hendra virus. These activities are expected to occur at any time and to result in better preparedness and planning in order to manage a possible future Hendra event. The second is the need for support to be provided to property owners, staff and other individuals such as veterinary practitioners once a property is under quarantine for suspected or confirmed Hendra virus infection, to help those individuals recognise their own responsibilities and take charge of those decisions for which they have WH&S responsibilities.

It is recommended that Queensland Primary Industries and Fisheries (QPIF) work with QH and with other stakeholders including AVA/EVA and horse industry groups such as QHC to address broad concerns about WH&S and management of human health risk during activities associated with investigation of a suspect case of Hendra virus and during response activities once a Hendra case has been confirmed. It is acknowledged that many of these concerns involve management of issues related to human health that are not the responsibility of QPIF.

Inter-agency contacts and activities

The Guidelines for Veterinarians states that BQ will contact QH whenever Hendra virus is confirmed or highly suspected.

In the initial investigation of events on the affected property on Saturday 8 August 2009, BQ officers contacted QH that day to report concerns over a suspect Hendra case in a horse and possible human exposure to infectious material. Notification to QH of a positive test result was then completed along with other notifications as soon as a positive result was confirmed by BSL.

QH staff are involved in the response at Cawarral with responsibility for managing public health aspects of the response including assessment and management of testing performed on people and in provision of medical care for individuals admitted to hospital during the response.

Contacts between BQ staff and QH staff are understood to be occurring at multiple levels during the current response including locally, regionally and at the state headquarters level. These include activities such as daily telephone debriefs involving representatives from both agencies at the local or regional level and focusing on operational matters, as well as frequent debriefs involving teleconference and meetings involving senior management staff at state headquarters.

This review finds that effective communication is occurring between QPIF and QH staff at both the local or operational level and at a policy level (state headquarters). However, it is not clear that there is a formal or structured arrangement or process for these contacts that may for example define the levels at which contact might be made, frequency of contact or debrief, nature of contact (meeting, conference call) or issues such as chairmanship of meetings, recording of minutes and action items and reporting.

In addition staff from both BQ and QH have been involved in joint operational activities both on the IP and in providing information and support to people on trace-forward or nearby properties and more broadly within the local community.

This report has identified a need for provision of support to help people on affected properties understand and manage their WH&S responsibilities (see previous section of this report). There is considered to be scope for additional joint activities involving QPIF and QH staff in addressing animal and human health concerns on affected properties. QH activities are outside of the terms of reference of this report and this section therefore is limited to suggestions that QPIF explore options to ensuring that effective communication continues to occur at multiple levels and in both directions between the two agencies (QPIF and QH) and that there be discussion over opportunities for joint activities with a particular focus on managing animal and human health concerns on affected properties and local communities during a response.

It is recommended that QPIF staff initiate a debrief with QH staff that covers issues arising from the Cawarral response including in particular communications between QPIF and QH, and joint activities involving staff from QPIF and QH during a Hendra investigation or response.

Appendix: Acronyms and abbreviations

AAHL	Australian Animal Health Laboratory
aCVO	Acting Chief Veterinary Officer
AHIC	Australian Horse Industry Council
ANEMIS	Animal Emergency Management Information System
APS	Agricultural Property System
ARI	Animal Research Institute, Yerongpilly (QPIF)
AVA	Australian Veterinary Association
BioSIRT	Bio-security, Surveillance, Incident Response and Tracing
BQ	Biosecurity Queensland (QPIF)
BSL	Biosecurity Sciences Laboratory (QPIF)
CVO	Chief Veterinary Officer
EI	Equine influenza
EIIS	Equine Influenza Information System
EMU	Emergency Management Unit (QPIF)
EPA	Environmental Protection Agency
EVA	Equine Veterinarians Australia
HeV	Hendra virus
IP	Infected premise
LCC	Local Control Centre
MSDS	Material safety data sheets
PAPR	Powered air-purifying respirator
PCR	Polymerase chain reaction
PDF	Portable Document Format
PIB	Primary Industries Building, 80 Ann Street, Brisbane
PPE	Personal protective equipment
PVP	Private veterinary practitioner
QH	Queensland Health
QHC	Queensland Horse Council
QHSS	Queensland Health Scientific Services
QPIF	Queensland Primary Industries and Fisheries
SCHQ	State Control Headquarters
VNT	Virus Neutralisation Test
WH&S	Workplace health and safety
WHSO	Workplace health and safety officer