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The Honourable Ian Rickuss MP
Chair
Environment, Agriculture, Resources and Energy Committee
Parliament House
George Street
BRISBANE QLD 4000

Dear Mr Rickuss

Thank you for your letter dated 1 November 2012, regarding the Land Protection Legislation (Flying-fox Control) Amendment Bill 2012.

In relation to the committee's specific questions regarding health implications for people living in close proximity to flying fox colonies and roosts, I provide the following advice:

Parasitic ticks

The main tick of public health significance in Australia is the paralysis tick (*Ixodes holocyclus*). Bandicoots are the main host of paralysis ticks, but they can also attach to a range of other animals including possums, kangaroos, wallabies, scrub turkeys, dogs, humans and flying foxes. Animal health experts advise that flying foxes are usually only sporadically affected as they generally roost and feed at higher levels while ticks are usually found close to ground level. However, food shortages or changes in eating behaviour may increase the exposure of flying foxes to ticks. For example spectacled flying fox colonies on the southern Atherton tablelands have been affected by paralysis ticks on an annual basis from September to January since the early 1990s. This is thought to be linked to their foraging on wild tobacco bushes. Animal health experts advise that paralysis ticks only sporadically affect other species of flying foxes on the Atherton Tablelands, and flying foxes in other parts of Queensland.

As paralysis ticks are widespread in bushland on the eastern seaboard of Australia, and flying foxes are not the principal host, flying fox colonies or roosts anywhere in Queensland are unlikely to make a significant contribution to the overall likelihood of humans being bitten by ticks.

Most tick bites do not cause any health problems in humans. Some people develop allergic reactions, which are usually relatively mild but in rare cases can be severe. Tick paralysis in humans is rare but occasionally occurs in young children. Due to improvements in medical treatment and availability of a tick antitoxin there have not been any documented cases of death of humans due to tick paralysis for many years.

Ticks can also transmit infectious diseases. Queensland tick typhus is the main tick-borne disease that is relevant in Queensland. It can be readily treated with a common antibiotic and serious illness is rare. If untreated, symptoms will resolve on their own within weeks to months. While Queensland tick typhus is thought to be uncommon, accurate data are not available as it is not notifiable.

Lyme disease is the most common tick-borne illness worldwide. However, the bacterium that causes it has never been isolated from a tick in Australia, or in a human who has not travelled outside Australia.

Ticks do not transmit Hendra virus or Australian bat lyssavirus, the two viruses specifically associated with flying foxes.

Contamination of drinking water

Urban Water Supplies

The consumption of water contaminated with animal faeces can lead to gastroenteritis caused by bacteria such as *E. coli*, *Campylobacter* and *Salmonella*. For this and other reasons, water from surface waters such as dams and rivers is typically treated at water treatment plants before being supplied as drinking water. It is not uncommon for surface waters to be contaminated by animal faeces and/or carcasses, however, well operated drinking water treatment systems will successfully mitigate any potential increased risk. No incidents of microbial contamination in treated drinking water have been reported in Queensland that have been attributed to the contamination of surface waters by flying fox faeces or flying fox carcasses.

Rainwater Tanks

Faeces deposited on roofs and gutters by flying foxes and other animals (including possums, birds, lizards, frogs and other bats) can contain bacteria including *E. coli*, *Campylobacter* and *Salmonella*, which can be washed into rainwater tanks during rainfall events. Given the potential for faecal contamination from a range of animals, Queensland Health recommends that people with access to a reticulated town water supply should use that supply for drinking, personal hygiene and food preparation purposes in preference to water from a rainwater tank. If a rainwater tank is the only supply available, the health risks can be reduced by appropriate management of the collection and storage system and effective treatment of the water. Advice on treatment options may be obtained from local rainwater tank suppliers or the enHealth 'Guidance on the use of rainwater tanks' document which is available at: [http://www.health.gov.au/internet/main/publishing.nsf/Content/DD676FA1241CDD0DCA25787000076BCD/\\$File/enhealth-raintank.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/DD676FA1241CDD0DCA25787000076BCD/$File/enhealth-raintank.pdf)

Swimming and other recreational water use

Recreational waters, swimming pools and outdoor spas can become contaminated with bacteria if animals (including flying foxes) defecate or urinate over or near them. However, humans are the most significant source of potentially disease causing bacteria in waters used by people for recreational purposes. In Australia, the risk of getting sick from swimming is significantly greater than from treated drinking water supplies. Risk from recreational water activities can be reduced by avoiding swimming in natural water bodies known to be subject to contamination by animal faeces, and by maintaining effective treatment of swimming pools, outdoor spas and water parks. If a property is under a flying fox flight path, it may be beneficial to keep pools and outdoor spas covered when not in use. The most important safeguard for outdoor pools and spas is to maintain effective disinfection.

Flying foxes may also be infected with viruses such as Australian bat lyssavirus or Hendra virus, however, these do not pose a risk through consumption of water (either reticulated town water supplies or rainwater) or swimming or other recreational water use. There is no evidence of direct bat to human transmission of Hendra virus – all seven human cases of Hendra virus infection to date had extensive exposures to the body fluids of infected horses. There is no evidence of transmission of Australian bat lyssavirus, or similar viruses such as rabies virus, through drinking water or recreational water use – transmission of these viruses occurs mainly through animal bites. Neither virus is able to survive for a significant time in the environment.

Contamination of food crops

Any fruit or vegetable could potentially be contaminated with bacteria, either from the soil or from animal or bird faeces. Flying fox faeces pose no different contamination risk to faeces from birds or other animals. Fruit and vegetables should be washed before use to minimise health risks, and should be discarded if they appear to have been damaged or partially eaten by animals.

Risks from handling surfaces contaminated with flying fox faeces

Surfaces contaminated with flying fox faeces pose no different risk to surfaces contaminated with bird faeces. Flying fox and bird faeces may contain bacteria that could cause gastroenteritis; the risk is mainly when the faeces are fresh and moist – when fully dried out the risk will be negligible. Queensland Health recommends that parents not allow their children to play on playground equipment that is visibly contaminated by animal or bird faeces. The local council or other owner should be contacted and asked to clean up such equipment. Cleaning with water to remove visible contamination is usually all that is necessary. If children have played on or touched a contaminated surface before it became apparent that the surface was contaminated, their hands should be washed, with soap and water or alcoholic hand rub where available.

Flies from decaying flying fox carcasses

Flies crawling on food may contaminate it with bacteria that could cause gastroenteritis. While the risk is generally low, food should be protected from flies where possible. Flies that have fed on a flying fox carcass would not pose any significantly different risk to flies that had fed on the faeces of other wild animals, pets or livestock.

Stress, anxiety and mental illness

Health, mental health and wellbeing depends on the quality of our environment – natural, built, social and cultural so far as we are able to walk and interact safely, breathe easily or realise our potential physically, intellectually and emotionally.

Mental health is a very complex construct; mental distress and most mental disorders are multifactorial in their aetiology; a multitude of risk factors influence the onset, course and restitution of disorders and these factors interact differentially at the individual, social and cultural levels.

In addition to a wide range of factors, research has identified three central social and environmental determinants of mental health as including:

- social inclusion (supportive relationships, involvement in community and group activities, civic engagement);
- freedom from discrimination and violence (personal safety and security); and
- access to economic resources (work, education, housing, money).

The built and proximal physical environments in which we live and interact can thus affect directly and indirectly the key determinants of mental health. From a stress response or risk factor perspective, close and persistent exposure to flying fox colonies, can result in a range of adverse

living experiences and conditions. These include increased noise; fear of contamination including from the cited carcasses and flies; restricted use of physical space as well as effecting land values and resale potential. Such adverse conditions can disrupt among other things the important processes of social inclusion and economic participation; sense of community, personal control, safety and mastery. This in turn can be detrimental to mental health; result in adverse short term psychological and physical responses; and potentially lead to longer term negative outcomes including depression, anxiety and other mental disorders.

The impact of environmental factors on a person's mental health and wellbeing is variable between individuals and therefore any adverse impact must be assessed on a case by case basis.

Charters Towers

Bat bites and scratches are notifiable to Queensland Health under the *Public Health Act 2005*. Public health units follow up all these notifications to ensure that the people bitten or scratched are promptly offered a course of post-exposure immunisation to prevent Australian bat lyssavirus (ABLV) infection (unless the bat has been euthanased and tested negative for ABLV). Post-exposure vaccination occurs either through GPs or at local hospital emergency departments on an 'outpatient' basis. Since 1996, 21 potential exposures (bat bites or scratches) have been reported in residents of Charters Towers, 13 of which were identified as related to flying foxes, 1 to a microbat, and 7 where the type of bat was not known. Numbers of exposures by year are shown in the table below.

Queensland Health is not aware of any 'inpatient' admissions to Charters Towers Hospital that have been verified as having been caused by exposure to flying foxes.

Table. Number of potential ABLV exposures and type of bat involved, Charters Towers, 1996 - 2012*

Year	Flying Fox	Microbat	Unknown Type	Total Exposures
1996			2	2
1997				0
1998			1	1
1999	1		1	2
2000	2			2
2001	2	1	2	5
2002	1			1
2003	1			1
2004			1	1
2005				0
2006				0
2007				0
2008	1			1
2009				0
2010	4			4
2011				0
*2012	1			1
Totals	13	1	7	21

* Year to date

Contact with domestic animals and livestock

Australian bat lyssavirus

There is currently no evidence that domestic animals in Australia (or any wild animals other than bats) have ever naturally contracted Australian bat lyssavirus (ABLV) infection, and no evidence that ABLV has ever been passed from a domestic animal to a human.

Hendra virus

All seven cases of human infection have been acquired through high level exposure to the body fluids (especially respiratory secretions and blood) of Hendra virus infected horses. It is thought that horses contract Hendra virus infection by eating material contaminated by infected flying fox body fluids and excretions.

There are a number of measures that horse owners can take to reduce the risk of horses becoming infected with Hendra virus. These include placing feed bins and water troughs under cover, avoiding planting trees that attract flying foxes in or near horse paddocks, removing horses from paddocks if flying foxes are feeding on trees or roosting in that paddock, and isolating sick horses. A vaccine for horses has also recently become available.

Measures that horse owners, veterinarians and others should take to reduce the risk of human infection include avoiding contact with sick horses where possible, using appropriate personal protective equipment, and showering/washing hands and clothes if contaminated by body fluids.

There has not been a case of human Hendra virus infection in Australia since 2009, despite more than 20 incidents involving infected horses in 2011 and 2012. This is thought to indicate that preventive measures are becoming more frequently practised by horse owners and veterinarians.

A single dog developed antibodies to Hendra virus, without illness, on a property where three horses developed Hendra virus infection in July 2011. Although the source of exposure for the dog cannot be definitively ascertained, horse-to-dog transmission is the most plausible scenario given the dog had opportunity for exposure to infected horses. There is no evidence to date that bat-to-dog or dog-to-person or dog-to-horse transmission occurs.

While cats, guinea pigs, ferrets and pigs have also been infected with Hendra virus experimentally, the virus has not been known to occur naturally in these animals.

Vulnerable population groups

The disease risks from living in close proximity to flying fox colonies or roosts are generally low and simple measures such as those outlined above, and not handling bats, particularly sick or injured bats, will reduce the risk further. In terms of population groups that may be more susceptible to disease risks, people with compromised immune systems should take particular care with washing fruit or vegetables and only drinking effectively treated water, as they may be more likely to develop gastroenteritis from consuming food or water contaminated with bacteria. Young children or adults with cognitive impairment may need supervision to ensure they don't handle injured bats, as with other environmental hazards.

Public health advice applicable to flying foxes closely resembles advice about snakes, i.e. people should leave them alone and not touch them. Only people with appropriate training (and in the case of flying foxes, who are vaccinated against rabies) should handle snakes or flying foxes.

Should you require further information, Queensland Health's contact is Dr Frank Beard, Senior Medical Officer, Communicable Diseases Unit, on telephone 3328 9725.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Michael O'Connell', with a small 'for' written below it.

Dr Tony O'Connell
Director-General