

**Preliminary  
Site Visit / Outbreak Investigation Report**

**Prepared by:** Dr. Albert Kane  
USDA APHIS Veterinary Services  
Ft Collins, CO

**Report Date:** 4/26/22  
4/28/22 updated

**Location/Event:** Canon City WHIP Corrals visit / disease investigation    **Exam Date:** 4/26/22

**Animal ID:** various animals among the West Douglas and other resident horses

**History:**

- Who:**
- initially limited to West Douglas horses in the NW corner of the facility
  - over the first few days increased morbidity affecting other resident horses
  - primarily adult horses but also foals
- What:**
- initial clinical signs included horses found dead in pens of West Douglas horses
  - thought to include respiratory and neurologic signs, after the first couple days clinical signs thought to be neurologic were attributed to hypoxia due to severe respiratory compromise, attending veterinarian concluded no neurologic signs were present
  - nasal discharge and coughing observed in the severely affected “West Douglas” pens and after a few days in other pens throughout the facility

**Working Case Definition:**

Horses found dead in pens or a **pneumonia problem characterized by “severe acute pulmonary edema and mild hemorrhage” or a respiratory condition characterized by mild/moderate fever, coughing or nasal discharge, depression, labored breathing**

**Differential Diagnoses:**

- a) equine herpes virus (EHV-1 neuropathogenic or wild type, -4 or one of the gamma herpes viruses such as -5 if associated with clinical signs of nodular fibrosis)
- b) equine influenza virus
- c) strep equi or zooepidemicus (strangles)
- d) equine rhinitis virus
- e) underlying plant or other toxic exposure or ingestion
- f) a previously unidentified respiratory virus or bacterial agent

Previously considered but now thought to be less likely differentials based on clinical signs and gross pathology also included: equine herpes myeloencephalopathy (EHM), monensin poisoning, botulism, poisonous plant intoxication (milkweed, whorled milkweed, hoary alyssum).

**When:** (all associated mortality to date among the West Douglas horses)

Monday, 4/18/22	1 foal, died after brief illness, sent for necropsy (possible incident case)
Saturday, 4/23/22	9 horses found dead in AM, very few sick horses seen in other pens
Sunday, 4/24/22	22 horses died, mild respiratory signs seen in 10% or so of the other pens
Monday, 4/25/22	24 horses died

Tuesday, 4/26/22      10 horses died among West Douglas horses, morbidity 40-60%  
mild respiratory signs seen in about 20% of the horses in most other pens

Wednesday, 4/27/22    See situation report for additional updates

**Where:** Canon City, Colorado; BLM prison contract facility

- all associated mortality to date has been in pens 40-43, “top” side of aerial image, these are the West Douglas horses in the NW corner of the facility
- horses with mild respiratory signs observed throughout the facility, I particularly observed these in some pens at the far “left, bottom” corner of the image, SW corner of the facility (horses previously scheduled to go to an adoption event this weekend)

**Diagnostic Plan:**

- to date approximately 15 necropsies have been conducted with associated tissues from these and several still living horses submitted for viral PCR testing, histopathology, bacterial culture and virus isolation
- pan herpes type PCR testing as well as for specific EHV subtypes and a broad panel of respiratory viruses including, influenza, rhinitis virus, strep species
- as of today 4/26/22 we will suspend sending additional carcasses off for necropsy to allow the laboratory testing to catch-up, may still necropsy some on site if indicated
- feed and water samples were collected Saturday and today additional feed samples along with stomach contents were collected and these are preserved for later testing if indicated

**Diagnostic/Laboratory Results:**

To date:            pneumonia as described above.  
                      initial EHV-1 PCR testing has been negative  
                      additional respiratory PCR testing - pending  
                      bacterial cultures - pending

**Other relevant findings/observations to date:**

- the West Douglas horses are either partially vaccinated or unvaccinated
- this problem appeared to start shortly (5-10 days) after an initial group of about 50 of these horses received their first vaccinations and appeared initially to start in and be most severe in this same group of horses
- the West Douglas horses were gathered and removed from the range after a large wildfire occurred in the area where they lived, this fire drove them into surrounding areas to escape the fire
- in the days prior to this outbreak wind storms throughout Colorado including at the facility produced severe dusty conditions with blowing dirt heavy enough in areas to block visibility for short intervals of time, temperatures were moderate throughout this time
- the most affected horses and other horses throughout the facility are almost; universally in good body condition (Henneke BCS  $\geq$  4); although every pen was not scored in detail, only two horses out of over 2500 observed today were noted to be thin with a BCS of 2.5-3

- the water source for all pens is potable well water either from an automatic waterer or a tank with a dedicated hydrant
- all horses are on a ration of alfalfa hay, purchased from a few brokers and confirmed to be sourced from Colorado
- some horses are fed 3x4 bales, some 4x4 bales but many pens are fed each type of bales
- no saddle horses have been moved on or off the premises recently
- initially a single loader was available for use on the facility, different heads were used and it was being sprayed with bleach as a disinfecting agent but it was being used to both load hay and dispose of carcasses
- some edema was noted in the area of the sheath in a few recently gelded horses, but no signs of facial edema or edema in other areas has been noted
- no severe foamy nasal discharge attributable to pulmonary edema has been seen in any of the sick horses

**Summary Assessment / Working Diagnosis:** Using the entire case definition and looking broadly at the pattern of the outbreak suggests this is a propagated contagious condition rather than a toxic ingestion or exposure. **We now believe this is primarily a respiratory condition characterized by pneumonia (with severe pulmonary edema and mild hemorrhage) with high mortality in the West Douglas group of horses as well as a more typical clinical manifestation among the other horses at the facility characterized by mild, viral respiratory signs more commonly seen in horses such as fever, nasal discharge and coughing.** It appears within the last few days that a respiratory condition with clinical signs of varying severity has already spread throughout the facility. This spread is most likely due to airborne droplet or aerosol transmission accelerated by recent high winds. Early clinical signs thought to be neurologic are now seen as most likely related to hypoxia and weakness due to severe pulmonary compromise. While we suspect an underlying viral cause, early tests for EHV-1 were negative.

Underlying reasons the West Douglas horses are so severely affected compared to other cohorts on the same premises are uncertain but could include previous exposure to smoke inhalation during the wildfire that prompted their capture and removal, unvaccinated or partially vaccinated status, exposure to extremely dusty conditions at the north edge of the facility, compromised immune system possibly due to a toxic plant or other exposure. No obvious weeds have been found in the alfalfa hay or growing in the pens to suggest a toxic principle may have predisposed these horses to a respiratory infection.

**Conclusion(s)/Current Recommendation(s):** Biosecurity measures including PPE guidelines and cleaning and disinfecting procedures have been put in place for trucks and equipment to help prevent or slow the spread of the illness throughout the facility. A second, dedicated loader will be used for loading carcasses. At this time we have agreed to suspend sending additional carcasses off site for necropsy to allow time for the laboratory testing to catch-up. On site necropsies may continue with some sample collection as indicated based on the observed clinical signs. We will look at the laboratory testing on samples collected to date for a consistent pattern of results that suggests or identifies an underlying cause for the pneumonia. If no significant results are obtained in the next 24-48 hours we will resume sample collection and testing as indicated by observed clinical signs and gross observations during necropsy.

# Number of Cases



