


Air Quality
Clean, Smart and Sustainable Solutions

Measurements and Control Strategies

AIR EMISSIONS FROM CATTLE FEEDYARDS AND DAIRIES



Featuring a team of scientists and engineers from:



Funded in large part by Special Research Grants from:

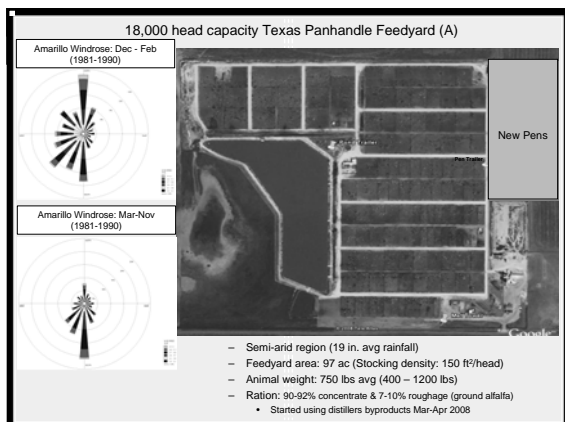


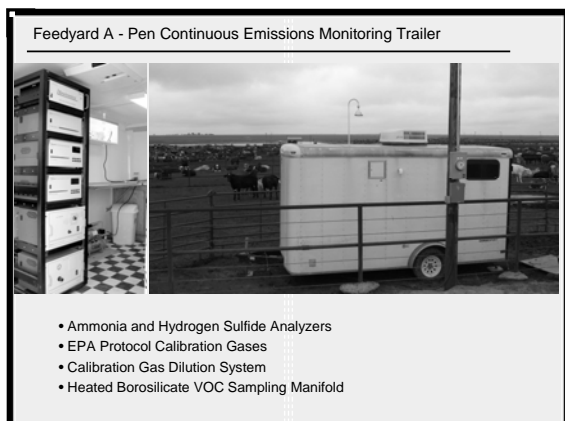
Hydrogen Sulfide (H₂S) Emissions

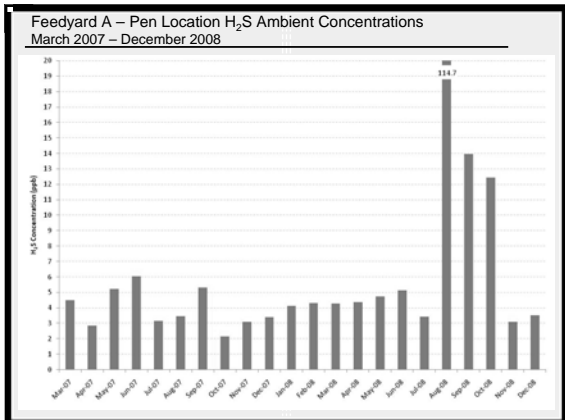
Ken Casey, Texas AgriLife Research

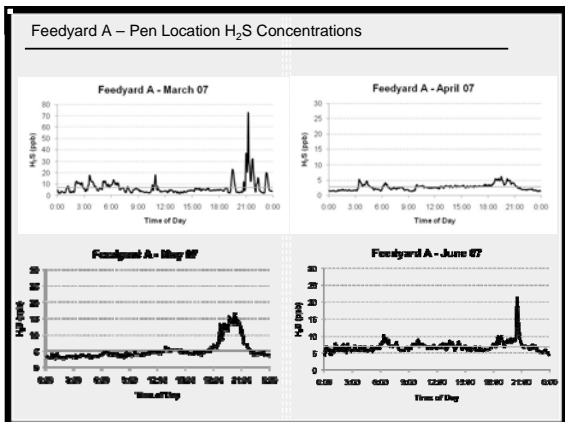
Why Hydrogen Sulfide?

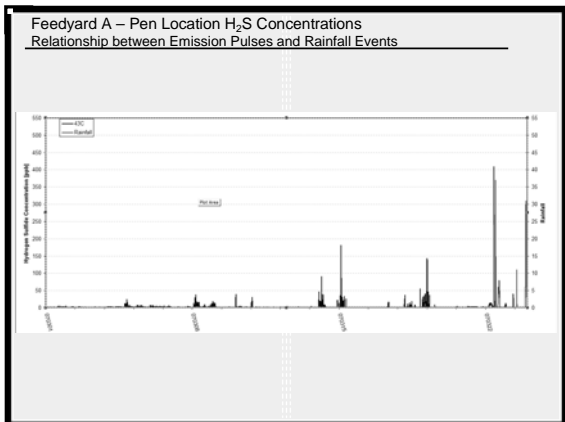
- Hydrogen sulfide (H_2S) is a naturally occurring, odorous compound produced by the decomposition of organic compounds.
- Results when bacteria breaks down organic matter in the absence of oxygen as occurs in a feedlot manure pack or feedlot runoff retention structure.
- Hydrogen sulfide is also emitted from waste storage and treatment facilities at other confined animal feeding operations (CAFOs).
- Concern that the downwind concentrations of H_2S may exceed published state regulatory values.
- EPCRA reporting threshold of 100 lbs/day

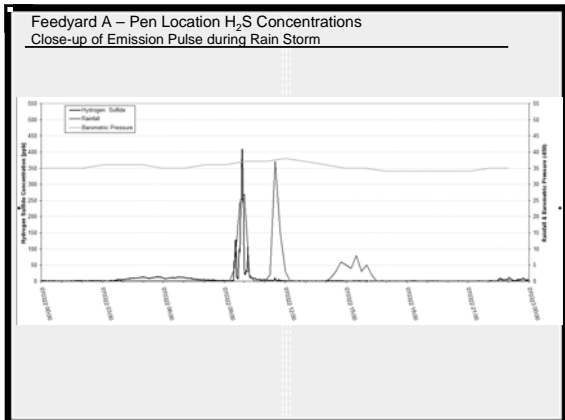


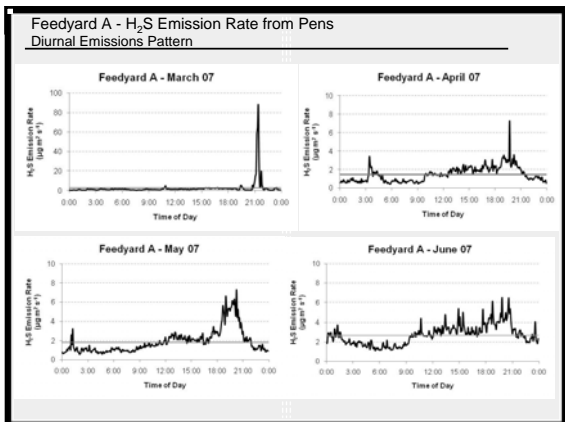








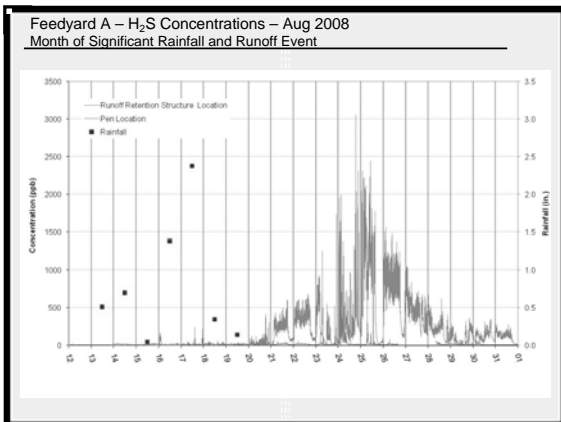
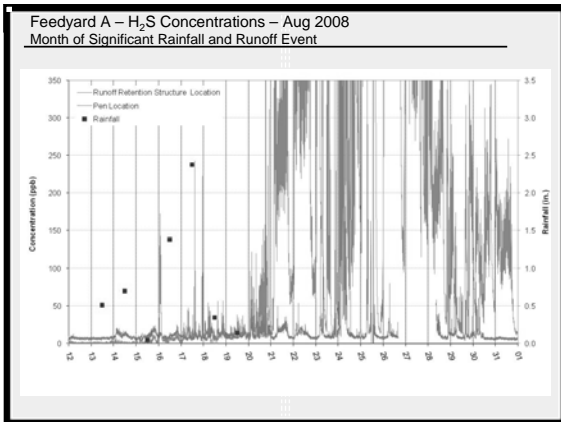
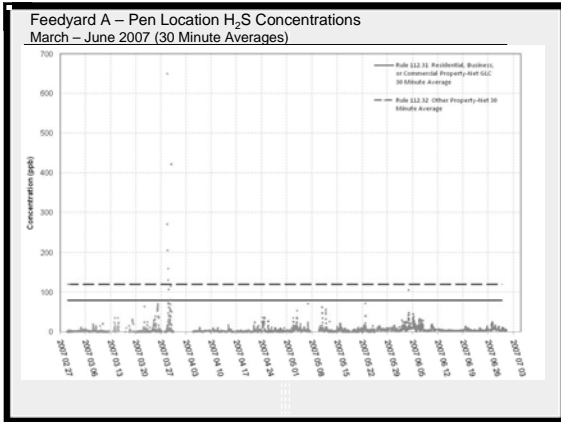




Feedyard A - H₂S Emission Rate
 Average Monthly Emissions

Period	Emissions (lb/day)	
	Pens	RRS
Mar 2007	170	
Apr 2007	100	
May 2007	124	
Jun 2007	184	
Jul 2007	73	
Aug 2007	81	
Sep 2007	132	
Oct 2007	54	
Nov 2007	102	3.3
Dec 2007	103	2.9
Jan 2008		10.1
Feb 2008		6.0
Mar 2008		7.3
Apr 2008		6.2
May 2008		13.9
Jun 2008		7.3
Average	112	7.3

Pen Area = 89 ac
 RRS Area = 18.5 ac



Summary

- Concentrations
 - generally low: 4.2 ppb avg (Mar 2007 – Jun 2008)
 - Occasional spikes to elevated levels of short duration
- Factors influencing Emission Rates
 - Rainfall Events
 - Manure pack moisture content (anaerobic conditions)
 - Runoff into runoff retention structure
- Emission Rate Estimates (NCBA Fact Sheet)

HYDROGEN SULFIDE (H₂S) EMISSIONS ESTIMATE
 The emissions estimates provided below are inclusive of hydrogen sulfide emissions from the feedyard pen surfaces and the runoff holding ponds. Hydrogen sulfide levels are fairly stable throughout the year, especially during dry weather conditions. Higher levels of hydrogen sulfide have been measured after rainfall/wet conditions.

Hydrogen Sulfide (H ₂ S) Emissions Estimate			
	Lowest Head Count	H ₂ S Emission Rate (pounds/head/day)	H ₂ S Lower Bound (pounds/day)
H ₂ S Lower Bound =	x	0.0047 ^a	=
		^a dry conditions emission rate from research data	
	Permitted Head Count	H ₂ S Emission Rate (pounds/head/day)	H ₂ S Upper Bound (pounds/day)
H ₂ S Upper Bound =	x	0.0047 ^a	=
		^a rainfall/wet conditions emission rate from research data	

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