Executive Committee
Board of Health
Land and Water Conservation Committee
Solid Waste Committee

July 20, 2022

Concentrated Animal Feeding Operation (CAFO)

- Livestock farm with 1,000 animal units or more

Animal Type		I. Mixed Animal Units			II. Non-mixed Animal Units		
		b. Equiv. factor	c. Current Number	d. No. of AUs	e. Equiv. factor	f. Current Number	g. No. of Aus
Example - Broilers (non-liquid manure):		*0.005 x*	*150,000*	*= 750*	*0.008 x*	*150,000*	*= 1200*
Dairy/Beef Calves (under 400 lbs)		0.20 x		=	*Fed numbers in this column comply with 40 CFR s. 122.23*		
Dairy Cattle	Milking & Dry Cows	1.40 x		=	1.43 x		=
	Heifers (800 lbs to 1200 lbs)	1.10 x		=			
	Heifers (400 lbs to 800 lbs)	0.60 x		=	1.00 x		=
Beef	Steers or Cows (400 lbs to market)	1.00 x		=			
	Bulls (each)	1.40 x		=	1.00 x		=
Veal Calves		0.50 x		=	1.00 x		=
Swine	Pigs (up to 55 lbs)	0.10 x		=	0.10 x		=
	Pigs (55 lbs to market)	0.40 x		=			
	Sows (each)	0.40 x		=			
	Boars (each)	0.50 x		=	0.40 x		=
Chickens	Layers (each) -non-liquid manure system	0.01 x		=	0.0123 x		=
	Broilers/Pullets (each) -non-liquid manure system	0.005 x		=	0.008 x		=
	Per Bird -liquid manure system	0.033 x		=	0.0333 x		=
Ducks	Ducks (each) -liquid manure system	0.2 x		=	0.2 x		=
	Ducks (each) -non-liquid manure system	0.01 x		=	0.0333 x		=
Turkeys (each)		0.018 x		=	0.018 x		=
Sheep (each)		0.1 x		=	0.1 x		=
Horses (each)		2 x		=	2 x		=
Total Animal Units:		**Total Mixed Animal Units =** (add all rows above)			**Total Non-Mixed Animal Units =** (Enter the single highest number from any row above; DO NOT add the totals)		

CAFOs in Jefferson County

- 5 Dairy operations: Katzman Farms, Kutz Dairy, Pond Hill Dairy, Rosy Lane Holsteins, Tag Lane Dairy Farm
- 3 Chicken (egg) operations: Cold Spring Egg Farm, Daybreak Foods, Dean's Eggs
- 1 Beef operation: Back Road Beef

- All have DNR permits and County permits
- DNR permits include more restrictive standards than non-CAFO farms must follow
- Statewide Overview: https://datcpgis.wi.gov/maps/?viewer=ls

Department of Natural Resources (DNR)

- DNR permit process
- LWCD – attends public hearings
- DNR farm inspections – LWCD often attends & explains County requirements for any proposed plans (increasing animal numbers, animal waste storage, etc.)

WPDES Permit Application Process

For Livestock/Poultry Operations

Operator's Application Process

Be sure to also apply for other necessary permits and approvals with the DNR and your town/county.

Applications must be submitted online through the Department's ePermitting System. Please refer to the Water Permits Water Portal page to begin the online application process: http://dnr.wi.gov/permits/water/ .

Submit **preliminary** application through the ePermitting System at least **12months** before you reach 1,000 animal units

- Form 3400-25 (Contact Information and Site Information),
- Form 3400-25A (Current and Projected AU Calculation Worksheets), and
- Site Maps.

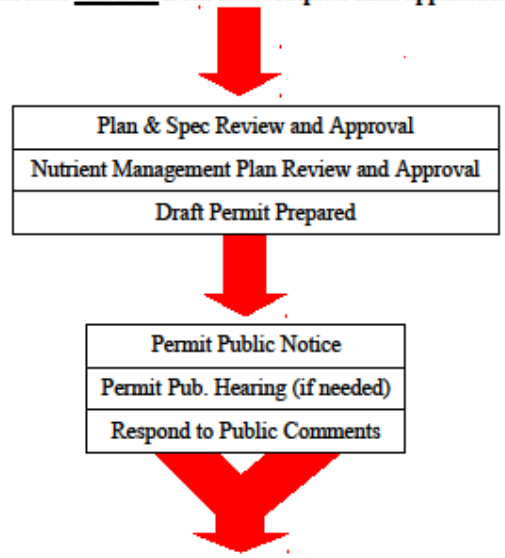
Regional DNR Staff schedules a site visit to go over final application materials.

Submit a complete **final** application at least 6 months before you reach 1,000 animal units

- EA Questionnaire,
- Final Nutrient Management Plan,
- Plans and Specifications for any Proposed Facilities or Systems,
- Evaluations of Previously Constructed Facilities or Systems, and
- 180-days Manure Storage Calculations.

DNR Internal Review And Processing

Process takes at least 6months from date complete final application is submitted.



Wisconsin Department of Natural Resources, PUB WT-713, 05/2017

Nutrient Management Plans

- Annual Plan - 2 Standards
  - All farms: NRCS 590 Standard
  - Farms ≥ 1,000 AUs: NRCS 590 + NR 243 (additional restrictions)
- Basic Elements of All Plans
  - Conservation plan including crop rotation and tillage
  - Soil tests – plans are phosphorus-based
  - UW recommendations on nutrient additions (manure, legume nitrogen, organic byproducts, commercial fertilizer)
  - Numerous restrictions related to distance from water and wells, frozen & snow-covered ground, sensitive soils (based on permeability, depth to bedrock and ground water table)

Livestock Facility Siting – County Process

- Adopted state law (Ch. 93, ATCP 51) in 2006
- CH 93, ATCP 51 regulations are implemented through County Zoning Ordinance (Conditional Use Permit)
- Criteria: farms proposing to expand to ≥ 150 AU
- Note: other counties have a 500 AU threshold
- Farms at 150-999 AU
  - 13 farms have Zoning Conditional Use Permits, pre-date ATCP 51, & will go through Siting if they propose changes (some currently don't have animals)
  - 15 farms with Zoning Conditional Use Permit via ATCP 51 process
- Farms ≥ 1,000 AU
  - 9 farms all have Zoning Conditional Use Permit via ATCP 51 process

Livestock Facility Siting – LWCD Process

- Farms submit the following for review by LWCD:
  - Application & permit fee
  - Maps
  - Plans: Employee Training Plan, Environmental Incident Response Plan, Nutrient Management Plan, Construction Plans
  - Worksheets: Animal Units, Odor Management, Waste & Nutrient Management, Waste Storage Facilities, Runoff Management
  - Supplemental information and supporting documents
- Farms must follow state laws & standards – many of which work to protect surface and groundwater
- When materials are final – LWCD forwards them to Zoning Department & Committee
- LWCD participates in Zoning meetings & public hearings

Livestock Facility Siting – Zoning Ordinance Process

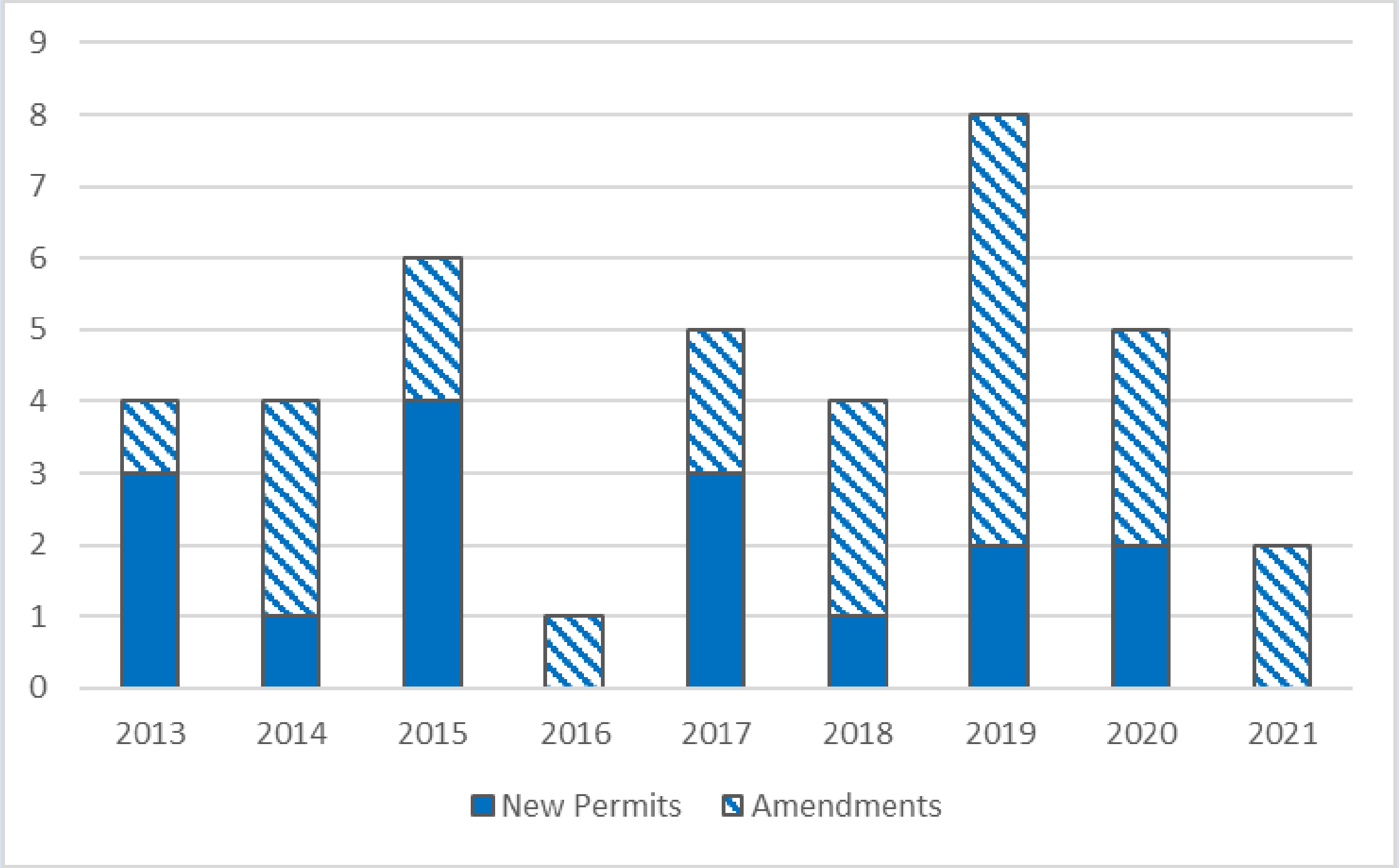
- Livestock Siting is implemented through County Zoning Ordinance and Conditional Use Permits
- Conditional Use Permit Process
  - Application is made with Zoning Department
  - LWCD reviews application, worksheets, plans, and all supplemental information and reports that all materials are final
  - Planning and Zoning Committee reviews LWCD recommendation and determines the application to be complete
  - Applicant attends Town meetings and Town recommends approval to Planning and Zoning Committee

Livestock Facility Siting – Zoning Ordinance Process

- Planning and Zoning Committee holds public hearing
  - Notice of hearing is sent to adjoining and neighboring landowners
- P/Z Committee holds decision meeting and takes action on the application
- Notice of approval/denial is provided to DATCP
- P/Z Department will monitor and follow up with farm as needed

Livestock Facility Siting – Amendments

- Farms already have a permit and are proposing to change any item covered by the rule
- No increase in animal numbers
- Farm submits livestock siting materials that have changed
- LWCD communicates to Zoning Department & Committee when materials are final
- LWCD participates in Zoning Meeting
- P/Z Committee reviews amendment and takes action on amendment
  - Public hearing is not required for an amendment, however, Committee action is required


9
8
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2013
2014
2015
2016
2017
2018
2019
2020
2021
New Permits
Amendments

Manure Complaints

- Potential issues include spills, spreading, manure stack placement
- Citizens contact DNR, LWCD or Zoning
- LWCD visits site(s)
- LWCD – coordinates with DNR if it is a CAFO or if water is impacted
- If there is a violation of standards/laws with a CAFO
  - DNR communicates with farm about necessary actions
- If there is a violation of standards/laws with a non-CAFO
  - Depending on situation: LWCD, Zoning, or DNR communicates with farm about necessary actions

Water Quality

- Surface Water Quality
  - DNR, volunteers, and County (for specific projects) collect water quality data that is entered into state-wide database
  - Data is collected to determine baseline conditions and trends
  - Data is not collected to specifically identify sources of pollutants – IF anomaly is found, it can be investigated
- Groundwater Quality
  - Health Department well testing provided for pregnant mothers & newborns
  - Landowners can get their well tested for a variety of parameters via labs (Madison, Stevens Point)
  - County staff – doing research on designing a groundwater quality study funded through ARPA money; implementation expected 2023-2024

Air Quality Regulations

- Air pollutants are regulated at the Federal level through the Clean Air Act
  - Animal feeding operations (AFO) are not exempt
- Federal regulations are incorporated into State regulations
  - Chs. NR 400, 403, 405, 406, 407, 408, 410, 415, 419-425, 429, 431, 438, 445, 455
  - Odors regulated under NR 429 and ATCP 51
  - AFOs are not exempt
- Wis. Stat. 285.28
  - Hazardous air contaminants associated with agricultural waste may not be regulated
  - Exemption does not apply to federal standards or regulations
- Information received from DNR Daybreak Air Quality Memo

Air Quality – Summary of DNR Question and Answer

- Q 15-17 – Air Permitting
  - CAFOs are required to receive permits if they meet the Federal Standards for permitting
    - Agricultural Waste is exempt from regulation
    - Equipment associated with CAFO may trigger need for permit (manure digesters, generators, manure drying/conversion to fertilizer, etc.)
- Q 18-21, 25-27, 31 – Jefferson County Air Quality
  - County is an attainment area and is improving based on DNR Annual Trends Report
  - Air Monitor installed near Jefferson Elementary School on Laatsch Lane
    - Monitors may cost $20,000 - $120,000 to install and $20,000 - $30,000 annually to maintain to meet federal monitoring requirements
  - DNR does not have funding to partner or install additional monitors

Air Quality – Summary of DNR Question and Answer

- Q 33 – Purple Air Sensor
  - Purple Air Sensor - can be used with a correction factor or monitor local air quality
    - Sensors are not designed to be used for regulatory purposes
    - Clean Air Act has requirements for monitors used for regulator purposes
- Q 22, 24 – County Regulations
  - DNR is not aware of other County's regulating air quality
  - State and Federal regulations do not preclude County from pursuing regulations following NR 403
    - Regulations must be approved by DNR and meet all requirements of NR 403.03

Legal Authority

General Rule – Local governments have limited authority to impose requirements on CAFOs per Wis. Stat. §93.90(3)(a).

Case Law & Administrative Code

- *Adams v. Wis. Livestock Facilities Siting Review Bd.,* 2012 WI 85 ¶ 50, and *Clean Wisconsin, Inc. v. Wisconsin Dep't of Nat. Res.*, 2021 WI 71, 398 Wis. 2d 386, 961 N.W.2d 346
- The legislature expressly withdrew, with limited exceptions, the power of political subdivisions to enforce livestock facility siting standards, to disapprove livestock facility siting permits, and to condition the grant of a livestock facility siting permit on any requirement other than the state standards.
- DNR has the statutory authority to regulate and impose conditions on CAFOs

What Authority Does the County Have?

- Regulate roads such as setting weight limits for vehicles travelling on roads and enacting ordinances penalizing individuals or organizations from leaving manure on the road.
- May enact more stringent local standards which must be based on reasonable and scientifically defensible findings of fact, adopted by the local jurisdiction, which clearly show that the standard is necessary to protect public health or safety
- Zoning ordinances/regulations - CAFOs can only be located in the proper zoning district (A1)
- Right to Farm limits county's authority to regulate certain violations.

Please share your views below about the impacts of CAFOs, Concentrated Animal Feeding Operations, using this brief questionnaire. It is important we share our stories with the people we have entrusted to make decisions for us.

Name: MARA D. BEKMANIS

Address (street, city, zip):

N9297 GREEN VALLEY RD. WATERTOWN, WI 53094

Email and/or cell phone:

ladymara2@gmail.com (920) 915-2735

Approximate distance from the CAFO: Within 1 mile.

How does the CAFO affect your family personally?

Large manure trucks frequently abstruct roads. Foul smell and spilled waste material on roads. Breathing problems lately durin large manure spreading on fields. Worried about my well water!

How do you feel the CAFO affects the larger community?

Property values suffer. Repairs to damged roads are not paid by CAFO, but our tax dollars. I ask that you include our worries in your future meetings. Show more concern for the local residents rather than the CAFO's prosperity!

Feel free to attach additional photos/thoughts if you need to!

July 15, 2022

Director Elizabeth Chilsen, RN
Jefferson County Health Department
1541 Annex Road
Jefferson, Wisconsin 53549

Dear Ms. Chilsen:

My name is Victor Karaliunas and I live in the Town of Ixonia. I live approximately 4.5 miles from a dairy CAFO. I personally have our well water tested yearly, as I am aware that the CAFO is situated directly over our recharge aquafier. I currently pay for the water testing which costs about $140/year. As you are aware, other parts of the state have experienced well water contamination already. I ask that Jefferson County provide free well water testing for all Jefferson County residents. It would be in the County's best interest, as well as mine, to stay ahead of this issue rather than wait for another Kewaunee Co. debacle.

Also, even though our residence is 4.5 miles away from the CAFO, the liquid manure smells are hard to bear. When the wind direction is from the northwest, we get the noxious smells despite the distance. Further, spreading of the liquid manure

TAKES PLACE LESS THAN A MILE FROM OUR RESIDENCE DURING CERTAIN TIMES OF THE YEAR AND THE ODORS ARE EVEN MORE INTENSE! THIS SPRING WAS ESPECIALLY BAD. MOST NOTABLY WAS ON MAY 10TH. I ASK THAT JEFFERSON COUNTY FIND WAYS TO MITIGATE THOSE ODORS AND THE VOCS THAT ARE FOUND IN THE AIR.

I HAVE MANY OTHER CONCERNS REGARDING THE MANY CAFOS IN JEFFERSON COUNTY, THEREFORE, I AM PLEADING WITH YOU TO DO ANYTHING POSSIBLE TO PROTECT THE HEALTH AND SAFETY OF ALL CITIZENS OF JEFFERSON COUNTY FROM DANGERS POSED BY THESE CAFOS!

PLEASE NOTE FOR THE RECORD MY COMMENTS AS I AM NOT ABLE TO ATTEND THE MEETING ON JULY 20TH EITHER VIRTUALLY OR IN-PERSON. THANK YOU FOR YOUR TIME AND ATTENTION TO THIS MOST IMPORTANT MATTER.

SINCERELY,

VICTOR KARALIUNAS
W. 262 HILLENDALE DR.
OCONOMOWOC, WI 53066 (TOWN OF IXONIA, JEFF. CO.)
NO E-MAIL ADDRESS
H: 262-567-4825 C: 262-443-6278

(2) ATTACHMENTS

January 17, 2022

Tyler Dix, CAFO Permit Coordinator
Wisconsin Department of Natural Resources
101 S. Webster Street P.O. Box 7921
Madison, WI 53707

Dear Mr. Dix:
Re: Kinnard Farms WI -0059536-04-2 Kewaunee County

Please be advised, I am strongly opposed to Kinnard Farm's WPDS permit being modified for inclusion of requirements to increase its animal units to a maximum of 21,450 animal units; however, I am strongly in favor of requirements to monitor groundwater at land application site(s) on a monthly basis and for the DNR to notify of any exceeds of a standard for any parameters. Further, I support the monitoring be exclusive of the increase in animal units during the permitting process. Monitoring should be, and should have always been, required.

Historically, due to a lack of monitoring the groundwater, the wells around the Kinnard Farms had become contaminated. Increasing the amount of liquid manure is definitely not the answer. Monitoring after an increase in animal units on karsts soils is only a matter of when, not if, there will be further contamination. The data to support my contentions is already available.

Please note for the record my comments as I am not able to attend the virtual hearing on January 20, 2022.

Thank you for your time and attention to this most important matter.

Sincerely,

Vic Karaliunas
W262 Hillendale Drive
Oconomowoc, WI 53066
H: 262-567-4825 C: 262-443-6278

FACT SHEET

AIR POLLUTION FROM FACTORY FARMS

- Most meat, milk, and eggs produced in the United States come from animals raised in industrial factory farms – facilities that confine hundreds, thousands, or even millions of animals.

- EPA estimates that there are approximately 20,000 of these facilities throughout the country, and many are geographically clustered in certain regions and communities.[i]

- Factory farms (also called concentrated animal feeding operations or CAFOs) produce more than 300 million tons of manure every year, which is more than three times the amount of waste produced by humans.[ii] The waste is often stored in enormous sewage pits or "lagoons" before being spread, effectively untreated, on crop land.

- Factory farms emit a large number of air pollutants, including hydrogen sulfide (which causes extreme odors for downwind residents, and contributes to acid rain and regional haze), ammonia (which causes respiratory problems in farmers and neighbors), particulate pollution (which can trigger asthma and heart attacks), volatile organic compounds (which can cause headaches, nausea, and increased risk of cancer), and greenhouse gases (which cause a warming of the climate often referred to as climate change). These dangerous air emissions emanate from various areas on the facility, with some of the greatest releases coming from the animal confinement areas and waste impoundments.

- Factory farm emissions of two greenhouse gases – methane and nitrous oxide – are a significant driver of climate change. Nitrous oxide has more than 300 times the global warming potential of carbon dioxide, and methane has more than 20 times the potential. In 2006, factory farms in the U.S. were responsible for emitting almost nine million tons of methane, or almost 185 million tons of carbon dioxide equivalent, according to EPA.[iii]

- Ammonia and nitrogen oxide gases from factory farms contribute to water pollution and "dead zones" in estuaries and lakes. Nitrogen from these gases binds to rain drops, where, upon precipitation, it is washed into waterways and feeds the growth of algae blooms, which die and rot, sucking oxygen out of the water.

- In addition to causing health and quality of life problems, air pollution from factory farms also drive down the real estate values of nearby residents. University of Missouri researchers found that every factory farm in that state depresses surrounding property values by $2.68 million.[iv]

- Despite clear scientific evidence that industrial animal operations contribute significantly to nationwide air pollution that negatively affects human health and welfare, EPA currently does not require factory farms to meet any testing, performance, or emission standards under the Clean Air Act, which was enacted nearly 45 years ago. However, as the petitions make clear, the Clean Air Act has two at least programs that EPA could use to regulate factory farm air pollution.

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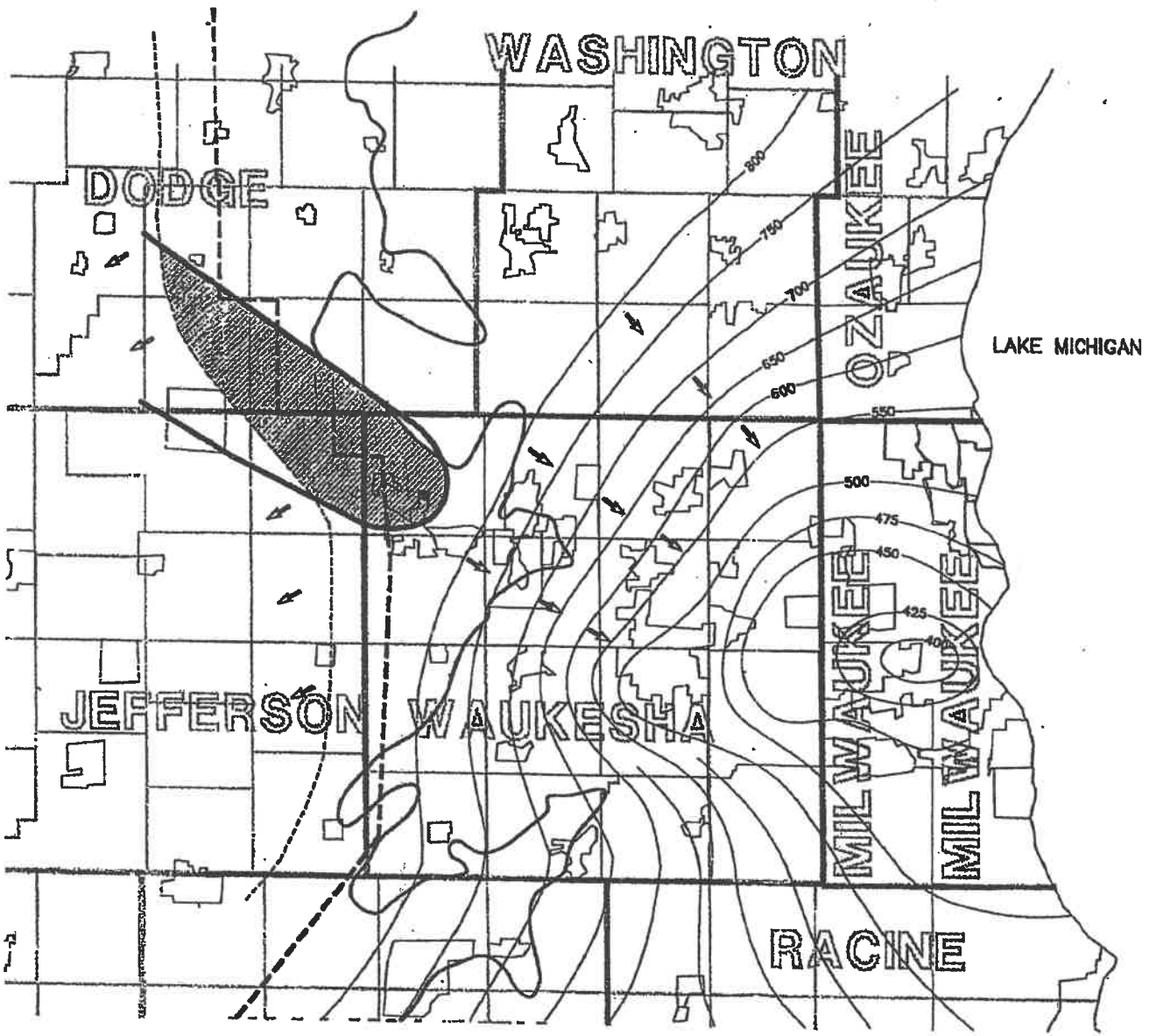
[i] EPA, NPDES CAFO Reporting Rule, 76 Fed. Reg. 65431, 65445 (Oct. 21, 2011).

[ii] Pew Commission on Industrial Farm Animal Production. "Putting meat on the table: industrial farm animal production in America." April 2008 at 23.

[iii] EPA, Overview of Greenhouse Gases, http://epa.gov/climatechange/ghgemissions/gases/ch4.html.

[iv] Mubarak, H., T.G. Johnson, and K.K. Miller. 1999. *The impacts of animal feeding operations on rural land values*. Report R-99-02. College of Agriculture, Food and Natural Resources, University of Missouri–Columbia.



EWRPC, WNHS

N

LEGEND

FLOW DIRECTION

POTENTIOMETRIC S
SANDSTONE AQUI

LIMITS OF MAQUO

POTENTIOMETRIC

POTENTIOMETRIC

RECHARGE AREA

CAPTURE ZONE

PROPOSED WELL

Ruekert | Mielke

FIGURE 2

PROPOSED WELL SI

CITY OF OCONO
WAUKESHA COUNTY,

SCALE 1"=30,000' | DATE JULY, 1994 | JOB NO. V

Resolution Requesting Water Quality Protection Measures from the WDNR for the Renewal of the Tag Lane Dairy, LLC WPDES Permit

WHEREAS, Tag Lane Dairy, LLC is a permitted Concentrated Animal Feeding Operation (CAFO) in the Town of Ixonia, Jefferson County; and

WHEREAS, they are proposing to expand the size of their dairy herd, which will increase the amount of animal waste product (manure) for spreading on farm lands, some of which are in the Oconomowoc River watershed; and

WHEREAS, land spreading of manure is one of the sources of phosphorous within the Oconomowoc River; and

WHEREAS, the City's Wastewater (WPDES) and Stormwater (MS4) permits require reductions in the amount of phosphorous discharged to Lac La Belle, Fowler Lake and the Oconomowoc River due to upstream nonpoint sources; and

WHEREAS, the increased land spreading of the manure generated from the operation, if not done properly, could negatively impact the water quality of the area lakes and rivers; and

WHEREAS, the aquifer recharge area for the City's drinking water is located near the dairy operation and fields being used to spread manure, which could also be impacted.

NOW THEREFORE, BE IT HEREBY RESOLVED the City of Oconomowoc is asking the Wisconsin Department of Natural Resources to take the appropriate steps necessary to protect the water quality of the area lakes and rivers when considering the renewal of the Tag Lane Dairy, LLC WPDES permit.

BE IT FURTHER RESOLVED appropriate protection of the recharge area of the aquifer be part of the permit renewal.

DATED: _____ CITY OF OCONOMOWOC

By: _____
David Nold, Mayor

ATTEST:

_____
Diane Coenen, Clerk

V:\Stormwater (new)\Adaptive Management\Tag Lane Dairy CAFO\Tag Lane Dairy CAFO.docx

Please share your views below about the impacts of CAFOs, Concentrated Animal Feeding Operations, using this brief questionnaire. It is important we share our stories with the people we have entrusted to make decisions for us.

Name: Sue Keeling

Address (street, city, zip):

N8570 River Valley Rd Ironia, WI 53036

Email and/or cell phone:

Keeling-sue@yahoo.com

Approximate distance from the CAFO: ½ mile

How does the CAFO affect your family personally?

I smell the odors from farm. Also have all the trucks + spreaders going past home.

How do you feel the CAFO affects the larger community?

I am concerned of the way the waste is not being disposed of properly as well as hazard in water shed in our community as well as where they are disposing.

Feel free to attach additional photos/thoughts if you need to!

Is there any water testing being done on the local level?

Please share your views below about the impacts of CAFOs, Concentrated Animal Feeding Operations, using this brief questionnaire. It is important we share our stories with the people we have entrusted to make decisions for us.

RECEIVED
JUL 18 2022
BY:

Name: Janet McConaughey

Address (street, city, zip):

N8154 LaSalle Circle Oconomowoc WI 53066

Email and/or cell phone:

greenherblady@yahoo.com

Approximate distance from the CAFO: 2.5 m.

How does the CAFO affect your family personally?

1) Smell when wind is in the right direction
2) Water quality - no recreation on the Rock River - impaired list.
3) Traffic - our roads are congested

How do you feel the CAFO affects the larger community?

1) Air quality & even esthetics re smell.
2) Higher cost to maintain roads.
3) Decreased tax base as property values decrease.

Feel free to attach additional photos/thoughts if you need to!

★ Input for Joint County Mtg on CAFO ~~issues~~ concerns

Please share your views below about the impacts of CAFOs, Concentrated Animal Feeding Operations, using this brief questionnaire. It is important we share our stories with the people we have entrusted to make decisions for us.

Name: Denise + Kevin O'Halloran

Address (street, city, zip):

N9246 Green Valley Rd., Fxonia
(mailing address is Watertown 53094)

Email and/or cell phone:

denise.ohalloran12@gmail.com / 893-1745 (262)

Approximate distance from the CAFO: less than 1 mile

How does the CAFO affect your family personally?

the CAFO has a constant negative effect on our home environment. When we purchased our 40 acre property in 1997 Tag Lane Farm was much smaller. (over →)

How do you feel the CAFO affects the larger community?

Unfortunately the TAG Lane CAFO has radically changed this beautiful rural community. This one property owner has been allowed to affect so many

Feel free to attach additional photos/thoughts if you need to! (over →)

CAFO affect personally continued

We have invested many hours of work and significant amounts of money into developing this land. The smell from the CAFO has been disgusting and stressful. The odor affects how we live. If the wind is coming from the south east any outside activity is unpleasant but also will be noticeable inside which is unacceptable. Also we are active runners and bicyclists. When the large, smelly manure haulers are distributing the roads are a severe hazard. Lastly, we are extremely concerned about the water table. We are dependent on our well and if that is contaminated our ~~weather~~ property is worthless.

CAFO community affects continued

other tax paying citizens. We are all worried about the Rock River, the water table, air quality and our property values.

★ Input for Joint County Mtg on CAFO Concerns

Please share your views below about the impacts of CAFOs, Concentrated Animal Feeding Operations, using this brief questionnaire. It is important we share our stories with the people we have entrusted to make decisions for us.

Name: Kevin O'Halloran

Address (street, city, zip):

N 9246 Green Valley Road Watertown WI 53094

Email and/or cell phone:

ohalbranmd@gmail.com 262-893-1744

Approximate distance from the CAFO: 0.8 mile

How does the CAFO affect your family personally?

Taglane CAFO on River Valley Rd Jxonia. The smell from their open sewage lagoon is disgusting & overwhelming if wind coming from South. Truck traffic is dangerous & destroys our roads.

How do you feel the CAFO affects the larger community?

Very negative on quality of life & Property Value. Tag lane has grown out of control since we moved here.

Feel free to attach additional photos/thoughts if you need to!

Please share your views below about the impacts of CAFOs, Concentrated Animal Feeding Operations, using this brief questionnaire. It is important we share our stories with the people we have entrusted to make decisions for us.

Name: Ed Cohen

Address (street, city, zip):

1018 N. Breens Bay Rd. Oconomowoc, WI 53066

Email and/or cell phone:

notheddie@gmail.com

Approximate distance from the CAFO: 20 miles

How does the CAFO affect your family personally?

- Taylane Farm sits on top of a critical recharge aquifer that feeds our well & lake.
- We are deeply concerned about its effect of the health & well being of our friends living adjacent to the CAFO.

How do you feel the CAFO affects the larger community?

It effects the health, wellbeing & quality of life of residents of Jefferson County & the surrounding areas. The CAFO leaches into a tributary of the Rock River

Feel free to attach additional photos/thoughts if you need to!

Cancer clusters have been identified among the residents in the area of Taylane Farm. Other CAFOs in the county have similar impacts on residents.

Please share your views below about the impacts of CAFOs, Concentrated Animal Feeding Operations, using this brief questionnaire. It is important we share our stories with the people we have entrusted to make decisions for us.

Name: Steve and Dyan Pasono

Address (street, city, zip):

N9071 Ridge Lane, Watertown, 53094

Email and/or cell phone:

sdpasono@gmail.com

Approximate distance from the CAFO: 3/4 mile

How does the CAFO affect your family personally?

See attached letter.

How do you feel the CAFO affects the larger community?

I request Jefferson County provide free water testing 2-3 x's per year for property owners living within 3 miles of CAFO manure land application sites.

Feel free to attach additional photos/thoughts if you need to!

I request Jefferson County develop air quality assessment programs to evaluate air quality near CAFO's.

To: Director Elizabeth Chilsen, RN
Jefferson County Health Department

Date: July 20, 2022

My husband and I live ¾ mile west of Tag Lane Farm (CAFO/Factory Farm) located in Ixonia and suffer the negative impacts of this industrial factory on a daily basis.

My husband and I purchased our 28 acre property over 25 years ago. We made improvements to the land and ultimately built our retirement home here 13 years ago. When we first purchased our rural property and built our home, Tag Lane Farms was a small family farm situated in Ixonia. Approximately 11 years ago this farm grew exponentially into what is now an industrial sized factory farm with approximately 3000 cows, producing millions of gallons of manure a year, all situated on a mere 33 acre parcel of land that sits atop a critical aquifer recharge zone with ground water that serves Waukesha County. Additionally, this same farm is located within a half mile of the already compromised Rock River.

In 2015 the Wisconsin Department of Health Services issued a report titled "Concentrated Animal Feeding Operations and Public Health". In this report the Department states that "If not properly managed, located and monitored, CAFOs can cause problems both locally and for the surrounding community. Some concerns raised about the potential impacts of CAFOs include: changes in air quality; increased odor and noise complaints; changes in land use; groundwater and surface water quality changes; damage to local roads from increased heavy truck traffic; and impacts on quantity and quality of nearby drinking water wells."

It's as though the Department lived in my home. We are forced to test our water regularly to ensure we are not being poisoned by run off from this farm, we are forced to have multiple water filtration systems installed in our home to protect us from potential poisoning from well contamination associated with this industrial factory farm, we are forced to live indoors and use our air conditioner throughout the spring, summer and autumn days due to the horrendous and toxic odors and particulate matter drifting from the 2 monstrous OPEN/UNCOVERED manure holding tanks, and the amount of flies in our back yard disturb any consideration to eat on our patio in the nice weather. This industrial factory farm affects us 365 days a year, 24 hours a day. On the 5-10 days a year we MIGHT be able to actually open our windows because the breeze just happens to be from the right direction, my sleep is disturbed because suddenly the breeze stops or switches directions and our entire home is consumed by the ammonia laden stench from the open manure pits. The costs and impacts of this factory farm affect people well beyond a mile radius. The quality of our lives have been forever changed because of one farmers desire to make more money....greed.

The Wisconsin Department of Health Services report from 2015 lays out the roles of various agencies regarding CAFOs and it states the Department of Health Services' role is to ensure protection of human health from harmful agents and to investigate health impacts from CAFOs.

I ask that you take my concerns seriously and investigate the health and quality of life impacts CAFOs such as TAG Lane Farm have on people who live within 2 miles of factory farms in Jefferson County. I ask that County departments work together to protect our health and well-being by establishing local zoning ordinanes/laws, set and enforce local nuisance ordinances/laws allowed within the "right to

farm" protections, develop and administer programs to protect public health and manage the soil to prevent over application of manure to protect local wells, the ground water, as well as the Rock River.

Thank you,

Dyan Pasono

N9071 Ridge Lane

Watertown, WI 53094

Understanding Concentrated Animal Feeding Operations and Their Impact on Communities

Author
Carrie Hribar, MA
Project Coordinator – Education and Training
National Association of Local Boards of Health

Editor
Mark Schultz, MEd
Grants Administrator/Technical Writer
National Association of Local Boards of Health

1840 East Gypsy Lane Road
Bowling Green, Ohio 43402
www.nalboh.org

Foreword

The National Association of Local Boards of Health (NALBOH) is pleased to provide *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities* to assist local boards of health who have concerns about concentrated animal feeding operations (CAFOs) or large industrial animal farms in their communities. The Environmental Health Services Branch of the Centers for Disease Control and Prevention (CDC), National Center for Environmental Health (NCEH) encouraged the development of this product and provided technical oversight and financial support. This publication was supported by Cooperative Agreement Number 5U38HM000512. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.

The mission of NALBOH is to strengthen boards of health, enabling them to promote and protect the health of their communities, through education, technical assistance, and advocacy. Boards of health are responsible for fulfilling three public health core functions: assessment, policy development, and assurance. For a health agency, this includes overseeing and ensuring that there are sufficient resources, effective policies and procedures, partnerships with other organizations and agencies, and regular evaluation of an agency's services.

NALBOH is confident that *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities* will help local board of health members understand their role in developing ways to mitigate potential problems associated with CAFOs. We trust that the information provided in this guide will enable board of health members to develop and sustain monitoring programs, investigate developing policy related to CAFOs, and create partnerships with other local and state agencies and officials to improve the health and well-being of communities everywhere.

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Introduction

Livestock farming has undergone a significant transformation in the past few decades. Production has shifted from smaller, family-owned farms to large farms that often have corporate contracts. Most meat and dairy products now are produced on large farms with single species buildings or open-air pens (MacDonald & McBride, 2009). Modern farms have also become much more efficient. Since 1960, milk production has doubled, meat production has tripled, and egg production has quadrupled (Pew Commission on Industrial Animal Farm Production, 2009). Improvements to animal breeding, mechanical innovations, and the introduction of specially formulated feeds and animal pharmaceuticals have all increased the efficiency and productivity of animal agriculture. It also takes much less time to raise a fully grown animal. For example, in 1920, a chicken took approximately 16 weeks to reach 2.2 lbs., whereas now they can reach 5 lbs. in 7 weeks (Pew, 2009).

New technologies have allowed farmers to reduce costs, which mean bigger profits on less land and capital. The current agricultural system rewards larger farms with lower costs, which results in greater profit and more incentive to increase farm size.

AFO vs. CAFO

A CAFO is a specific type of large-scale industrial agricultural facility that raises animals, usually at high-density, for the consumption of meat, eggs, or milk. To be considered a CAFO, a farm must first be categorized as an animal feeding operation (AFO). An AFO is a lot or facility where animals are kept confined and fed or maintained for 45 or more days per year, and crops, vegetation, or forage growth are not sustained over a normal growing period (Environmental Protection Agency [EPA], 2009). CAFOs are classified by the type and number of animals they contain, and the way they discharge waste into the water supply. CAFOs are AFOs that contain at least a certain number of animals, or have a number of animals that fall within a range and have waste materials that come into contact with the water supply. This contact can either be through a pipe that carries manure or wastewater to surface water, or by animal contact with surface water that runs through their confined area. (See Appendix A)

History

AFOs were first identified as potential pollutants in the 1972 Clean Water Act. Section 502 identified "feedlots" as "point sources" for pollution along with other industries, such as fertilizer manufacturing. Consequently, a permit program entitled the National Pollutant Discharge Elimination System (NPDES) was created which set effluent limitation guidelines and standards (ELGs) for CAFOs. CAFOs have since been regulated by NPDES or a state equivalent since the mid-1970s. The definitions of what was considered an AFO or CAFO were created by the EPA for the NPDES process in 1976. These regulations remained in effect for more than 25 years, but increases and changes to farm size and production methods required an update to the permit system.

The regulations guiding CAFO permits and operations were revised in 2003. New inclusions in the 2003 regulations were that all CAFOs had to apply for a NPDES permit even if they only discharged in the event of a large storm. Large poultry operations were included in the regulations, regardless of their waste disposal system, and all CAFOs that held a NPDES permit were required to develop and implement a nutrient management plan. These plans had CAFOs identify ways to treat or process waste in a way that maintained nutrient levels at the appropriate amount.

The 2003 CAFO rule was subsequently challenged in court. A Second Circuit Court of Appeals decision required alteration to the CAFO permitting system. In *Water Keeper et al. vs. the EPA*, the court directed the EPA to remove the requirement for all CAFOs to apply for NPDES. Instead, the court required that nutrient management plans be submitted with the permit application, reviewed by officials and the public, and the terms of the plan be incorporated into the permit.

As a result of this court decision, the CAFO rule was again updated. The current final CAFO rule, which was revised in 2008, requires that only CAFOs which discharge or propose to discharge waste apply for permits. The EPA has also provided clarification in the discussion surrounding the rule on how CAFOs should assess whether they discharge or propose to discharge. There is also the opportunity to receive a no discharge certification for CAFOs that do not discharge or propose to discharge. This certification demonstrates that the CAFO is not required to acquire a permit. And while CAFOs were required to create nutrient management plans under the 2003 rule, these plans were now included with permit applications, and had a built-in time period for public review and comment.

Benefits of CAFOs

When properly managed, located, and monitored, CAFOs can provide a low-cost source of meat, milk, and eggs, due to efficient feeding and housing of animals, increased facility size, and animal specialization. When CAFOs are proposed in a local area, it is usually argued that they will enhance the local economy and increase employment. The effects of using local materials, feed, and livestock are argued to ripple throughout the economy, and increased tax expenditures will lead to increase funds for schools and infrastructure.

Environmental Health Effects

The most pressing public health issue associated with CAFOs stems from the amount of manure they produce. CAFO manure contains a variety of potential contaminants. It can contain plant nutrients such as nitrogen and phosphorus, pathogens such as *E. coli*, growth hormones, antibiotics, chemicals used as additives to the manure or to clean equipment, animal blood, silage leachate from corn feed, or copper sulfate used in footbaths for cows.

Depending on the type and number of animals in the farm, manure production can range between 2,800 tons and 1.6 million tons a year (Government Accountability Office [GAO], 2008). Large farms can produce more waste than some U.S. cities—a feeding operation with 800,000 pigs could produce over 1.6 million tons of waste a year. That amount is one and a half times more than the annual sanitary waste produced by the city of Philadelphia, Pennsylvania (GAO, 2008). Annually, it is estimated that livestock animals in the U.S. produce each year somewhere between 3 and 20 times more manure than people in the U.S. produce, or as much as 1.2–1.37 billion tons of waste (EPA, 2005). Though sewage treatment plants are required for human waste, no such treatment facility exists for livestock waste.

While manure is valuable to the farming industry, in quantities this large it becomes problematic. Many farms no longer grow their own feed, so they cannot use all the manure they produce as fertilizer. CAFOs must find a way to manage the amount of manure produced by their animals. Ground application of untreated manure is one of the most common disposal methods due to its low cost. It has limitations, however, such as the inability to apply manure while the ground is frozen. There are also limits as to how many nutrients from manure a land area can handle. Over application of livestock wastes can overload

soil with macronutrients like nitrogen and phosphorous and micronutrients that have been added to animal feed like heavy metals (Burkholder et al., 2007). Other manure management strategies include pumping liquefied manure onto spray fields, trucking it off-site, or storing it until it can be used or treated. Manure can be stored in deep pits under the buildings that hold animals, in clay or concrete pits, treatment lagoons, or holding ponds.

Animal feeding operations are developing in close proximity in some states, and fields where manure is applied have become clustered. When manure is applied too frequently or in too large a quantity to an area, nutrients overwhelm the absorptive capacity of the soil, and either run off or are leached into the groundwater. Storage units can break or become faulty, or rainwater can cause holding lagoons to overflow. While CAFOs are required to have permits that limit the levels of manure discharge, handling the large amounts of manure inevitably causes accidental releases which have the ability to potentially impact humans.

The increased clustering and growth of CAFOs has led to growing environmental problems in many communities. The excess production of manure and problems with storage or manure management can affect ground and surface water quality. Emissions from degrading manure and livestock digestive processes produce air pollutants that often affect ambient air quality in communities surrounding CAFOs. CAFOs can also be the source of greenhouse gases, which contribute to global climate change.

All of the environmental problems with CAFOs have direct impact on human health and welfare for communities that contain large industrial farms. As the following sections demonstrate, human health can suffer because of contaminated air and degraded water quality, or from diseases spread from farms. Quality of life can suffer because of odors or insect vectors surrounding farms, and property values can drop, affecting the financial stability of a community. One study found that 82.8% of those living near and 89.5% of those living far from CAFOs believed that their property values decreased, and 92.2% of those living near and 78.9% of those living far from CAFOs believed the odor from manure was a problem. The study found that real estate values had not dropped and odor infestations were not validated by local governmental staff in the areas. However, the concerns show that CAFOs remain contentious in communities (Schmalzried and Fallon, 2007). CAFOs are an excellent example of how environmental problems can directly impact human and community well-being.

Groundwater

Groundwater can be contaminated by CAFOs through runoff from land application of manure, leaching from manure that has been improperly spread on land, or through leaks or breaks in storage or containment units. The EPA's 2000 National Water Quality Inventory found that 29 states specifically identified animal feeding operations, not just concentrated animal feeding operations, as contributing to water quality impairment (Congressional Research Service, 2008). A study of private water wells in Idaho detected levels of veterinary antibiotics, as well as elevated levels of nitrates (Batt, Snow, & Alga, 2006). Groundwater is a major source of drinking water in the United States. The EPA estimates that 53% of the population relies on groundwater for drinking water, often at much higher rates in rural areas (EPA, 2004). Unlike surface water, groundwater contamination sources are more difficult to monitor. The extent and source of contamination are often harder to pinpoint in groundwater than surface water contamination. Regular testing of household water wells for total and fecal coliform bacteria is a crucial element in monitoring groundwater quality, and can be the first step in discovering contamination issues related to CAFO discharge. Groundwater contamination can also affect surface water (Spellman &

Whiting, 2007). Contaminated groundwater can move laterally and eventually enter surface water, such as rivers or streams.

When groundwater is contaminated by pathogenic organisms, a serious threat to drinking water can occur. Pathogens survive longer in groundwater than surface water due to lower temperatures and protection from the sun. Even if the contamination appears to be a single episode, viruses could become attached to sediment near groundwater and continue to leach slowly into groundwater. One pollution event by a CAFO could become a lingering source of viral contamination for groundwater (EPA, 2005).

Groundwater can still be at risk for contamination after a CAFO has closed and its lagoons are empty. When given increased air exposure, ammonia in soil transforms into nitrates. Nitrates are highly mobile in soil, and will reach groundwater quicker than ammonia. It can be dangerous to ignore contaminated soil. The amount of pollution found in groundwater after contamination depends on the proximity of the aquifer to the CAFO, the size of the CAFO, whether storage units or pits are lined, the type of subsoil, and the depth of the groundwater.

If a CAFO has contaminated a water system, community members should be concerned about nitrates and nitrate poisoning. Elevated nitrates in drinking water can be especially harmful to infants, leading to blue baby syndrome and possible death. Nitrates oxidize iron in hemoglobin in red blood cells to methemoglobin. Most people convert methemoglobin back to hemoglobin fairly quickly, but infants do not convert back as fast. This hinders the ability of the infant's blood to carry oxygen, leading to a blue or purple appearance in affected infants. However, infants are not the only ones who can be affected by excess nitrates in water. Low blood oxygen in adults can lead to birth defects, miscarriages, and poor general health. Nitrates have also been speculated to be linked to higher rates of stomach and esophageal cancer (Bowman, Mueller, & Smith, 2000). In general, private water wells are at higher risk of nitrate contamination than public water supplies.

Surface Water

The agriculture sector, including CAFOs, is the leading contributor of pollutants to lakes, rivers, and reservoirs. It has been found that states with high concentrations of CAFOs experience on average 20 to 30 serious water quality problems per year as a result of manure management problems (EPA, 2001). This pollution can be caused by surface discharges or other types of discharges. Surface discharges can be caused by heavy storms or floods that cause storage lagoons to overfill, running off into nearby bodies of water. Pollutants can also travel over land or through surface drainage systems to nearby bodies of water, be discharged through manmade ditches or flushing systems found in CAFOs, or come into contact with surface water that passes directly through the farming area. Soil erosion can contribute to water pollution, as some pollutants can bond to eroded soil and travel to watersheds (EPA, 2001). Other types of discharges occur when pollutants travel to surface water through other mediums, such as groundwater or air.

Contamination in surface water can cause nitrates and other nutrients to build up. Ammonia is often found in surface waters surrounding CAFOs. Ammonia causes oxygen depletion from water, which itself can kill aquatic life. Ammonia also converts into nitrates, which can cause nutrient overloads in surface waters (EPA, 1998). Excessive nutrient concentrations, such as nitrogen or phosphorus, can lead to eutrophication and make water inhabitable to fish or indigenous aquatic life (Sierra Club Michigan Chapter, n.d.). Nutrient over-enrichment causes algal blooms, or a rapid increase of algae growth in an aquatic environment (Science Daily, n.d.). Algal blooms can cause a spiral of environmental problems to an aquatic system. Large groups of algae can block sunlight from underwater plant life, which are

habitats for much aquatic life. When algae growth increases in surface water, it can also dominate other resources and cause plants to die. The dead plants provide fuel for bacteria to grow and increased bacteria use more of the water's oxygen supply. Oxygen depletion once again causes indigenous aquatic life to die. Some algal blooms can contain toxic algae and other microorganisms, including *Pfiesteria*, which has caused large fish kills in North Carolina, Maryland, and the Chesapeake Bay area (Spellman & Whiting, 2007). Eutrophication can cause serious problems in surface waters and disrupt the ecological balance.

Water tests have also uncovered hormones in surface waters around CAFOs (Burkholder et al., 2007). Studies show that these hormones alter the reproductive habits of aquatic species living in these waters, including a significant decrease in the fertility of female fish. CAFO runoff can also lead to the presence of fecal bacteria or pathogens in surface water. One study showed that protozoa such as *Cryptosporidium parvum* and *Giardia* were found in over 80% of surface water sites tested (Spellman & Whiting, 2007). Fecal bacteria pollution in water from manure land application is also responsible for many beach closures and shellfish restrictions.

Air Quality

In addition to polluting ground and surface water, CAFOs also contribute to the reduction of air quality in areas surrounding industrial farms. Animal feeding operations produce several types of air emissions, including gaseous and particulate substances, and CAFOs produce even more emissions due to their size. The primary cause of gaseous emissions is the decomposition of animal manure, while particulate substances are caused by the movement of animals. The type, amount, and rate of emissions created depends on what state the manure is in (solid, slurry, or liquid), and how it is treated or contained after it is excreted. Sometimes manure is "stabilized" in anaerobic lagoons, which reduces volatile solids and controls odor before land application.

The most typical pollutants found in air surrounding CAFOs are ammonia, hydrogen sulfide, methane, and particulate matter, all of which have varying human health risks. Table 1 on page 6 provides information on these pollutants.

Most manure produced by CAFOs is applied to land eventually and this land application can result in air emissions (Merkel, 2002). The primary cause of emission through land application is the volatilization of ammonia when the manure is applied to land. However, nitrous oxide is also created when nitrogen that has been applied to land undergoes nitrification and denitrification. Emissions caused by land application occur in two phases: one immediately following land application and one that occurs later and over a longer period as substances in the soil break down. Land application is not the only way CAFOs can emit harmful air emissions—ventilation systems in CAFO buildings can also release dangerous contaminants. A study by Iowa State University, which was a result of a lawsuit settlement between the Sierra Club and Tyson Chicken, found that two chicken houses in western Kentucky emitted over 10 tons of ammonia in the year they were monitored (Burns et al., 2007).

Most studies that examine the health effects of CAFO air emissions focus on farm workers, however some have studied the effect on area schools and children. While all community members are at risk from lowered air quality, children take in 20-50% more air than adults, making them more susceptible to lung disease and health effects (Kleinman, 2000). Researchers in North Carolina found that the closer children live to a CAFO, the greater the risk of asthma symptoms (Barrett, 2006). Of the 226 schools that were included in the study, 26% stated that there were noticeable odors from CAFOs outdoors, while 8% stated

Table 1 Typical pollutants found in air surrounding CAFOs.

CAFO Emissions	Source	Traits	Health Risks
Ammonia	Formed when microbes decompose undigested organic nitrogen compounds in manure	Colorless, sharp pungent odor	Respiratory irritant, chemical burns to the respiratory tract, skin, and eyes, severe cough, chronic lung disease
Hydrogen Sulfide	Anaerobic bacterial decomposition of protein and other sulfur containing organic matter	Odor of rotten eggs	Inflammation of the moist membranes of eye and respiratory tract, olfactory neuron loss, death
Methane	Microbial degradation of organic matter under anaerobic conditions	Colorless, odorless, highly flammable	No health risks. Is a greenhouse gas and contributes to climate change.
Particulate Matter	Feed, bedding materials, dry manure, unpaved soil surfaces, animal dander, poultry feathers	Comprised of fecal matter, feed materials, pollen, bacteria, fungi, skin cells, silicates	Chronic bronchitis, chronic respiratory symptoms, declines in lung function, organic dust toxic syndrome

they experience odors from CAFOs inside the schools. Schools that were closer to CAFOs were often attended by students of lower socioeconomic status (Mirabelli, Wing, Marshall, & Wilcosky, 2006).

There is consistent evidence suggesting that factory farms increase asthma in neighboring communities, as indicated by children having higher rates of asthma (Sigurdarson & Kline, 2006; Mirabelli et al., 2006). CAFOs emit particulate matter and suspended dust, which is linked to asthma and bronchitis. Smaller particles can actually be absorbed by the body and can have systemic effects, including cardiac arrest. If people are exposed to particulate matter over a long time, it can lead to decreased lung function (Michigan Department of Environmental Quality [MDEQ] Toxics Steering Group [TSG], 2006). CAFOs also emit ammonia, which is rapidly absorbed by the upper airways in the body. This can cause severe coughing and mucous build-up, and if severe enough, scarring of the airways. Particulate matter may lead to more severe health consequences for those exposed by their occupation. Farm workers can develop acute and chronic bronchitis, chronic obstructive airways disease, and interstitial lung disease. Repeated exposure to CAFO emissions can increase the likelihood of respiratory diseases. Occupational asthma, acute and chronic bronchitis, and organic dust toxic syndrome can be as high as 30% in factory farm workers

(Horrigan, Lawrence, & Walker, 2002). Other health effects of CAFO air emissions can be headaches, respiratory problems, eye irritation, nausea, weakness, and chest tightness.

There is evidence that CAFOs affect the ambient air quality of a community. There are three laws that potentially govern CAFO air emissions—the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as the Superfund Act), the Emergency Planning & Community Right to Know Act (EPCRA), and the Clean Air Act (CAA). However, the EPA passed a rule that exempts all CAFOs from reporting emissions under CERCLA. Only CAFOs that are classified as large are required to report any emission event of 100 pounds of ammonia or hydrogen sulfide or more during a 24-hour period locally or to the state under EPCRA (Michigan State University Extension, n.d.). The EPA has also instituted a voluntary Air Quality Compliance Agreement in which they will monitor some CAFO air emissions, and will not sue offenders but instead charge a small civil penalty. These changes have attracted criticism from environmental and community leaders who state that the EPA has yielded to influence from the livestock industry. The changes also leave ambiguity as to whether emission standards and air quality near CAFOs are being monitored.

Greenhouse Gas and Climate Change

Aside from the possibility of lowering air quality in the areas around them, CAFOs also emit greenhouse gases, and therefore contribute to climate change. Globally, livestock operations are responsible for approximately 18% of greenhouse gas production and over 7% of U.S. greenhouse gas emissions (Massey & Ulmer, 2008). While carbon dioxide is often considered the primary greenhouse gas of concern, manure emits methane and nitrous oxide which are 23 and 300 times more potent as greenhouse gases than carbon dioxide, respectively. The EPA attributes manure management as the fourth leading source of nitrous oxide emissions and the fifth leading source of methane emissions (EPA, 2009).

The type of manure storage system used contributes to the production of greenhouse gases. Many CAFOs store their excess manure in lagoons or pits, where they break down anaerobically (in the absence of oxygen), which exacerbates methane production. Manure that is applied to land or soil has more exposure to oxygen and therefore does not produce as much methane. Ruminant livestock, such as cows, sheep, or goats, also contribute to methane production through their digestive processes. These livestock have a special stomach called a rumen that allows them to digest tough grains or plants that would otherwise be unusable. It is during this process, called enteric fermentation, that methane is produced. The U.S. cattle industry is one of the primary methane producers. Livestock production and meat and dairy consumption has been increasing in the United States, so it can only be assumed that these greenhouse gas emissions will also rise and continue to contribute to climate change.

Odors

One of the most common complaints associated with CAFOs are the odors produced. The odors that CAFOs emit are a complex mixture of ammonia, hydrogen sulfide, and carbon dioxide, as well as volatile and semi-volatile organic compounds (Heederik et al., 2007). These odors are worse than smells formerly associated with smaller livestock farms. The anaerobic reaction that occurs when manure is stored in pits or lagoons for long amounts of time is the primary cause of the smells. Odors from waste are carried away from farm areas on dust and other air particles. Depending on things like weather conditions and farming techniques, CAFO odors can be smelled from as much as 5 or 6 miles away, although 3 miles is a more common distance (State Environmental Resource Center, 2004).

Because CAFOs typically produce malodors, many communities want to monitor emissions and odors. Quantifying odor from industrial farming can be challenging because it is a mixture of free and particle-bound compounds, which can make it hard to identify what specifically is causing the odor. Collecting data on specific gases, such as hydrogen sulfide, can be used as a proxy for odor levels.

CAFO odors can cause severe lifestyle changes for individuals in the surrounding communities and can alter many daily activities. When odors are severe, people may choose to keep their windows closed, even in high temperatures when there is no air conditioning. People also may choose to not let their children play outside and may even keep them home from school. Mental health deterioration and an increased sensitization to smells can also result from living in close proximity to odors from CAFOs. Odor can cause negative mood states, such as tension, depression, or anger, and possibly neurophysciatric abnormalities, such as impaired balance or memory. People who live close to factory farms can develop CAFO-related post traumatic stress disorder, including anxiety about declining quality of life (Donham et al., 2007).

Ten states use direct regulations to control odors emitted by CAFOs. They prohibit odor emissions greater than a set standard. States with direct regulations use scentometers, which measure how many times an odor has to be doused with clean air before the smell is undetectable. An additional 34 states have indirect methods to reduce CAFO odors. These include: setbacks, which specify how far CAFO structures have to be from other buildings; permits, which are the most typical way of regulating CAFOs; public comment or involvement periods; and operator or manure placement training.

Insect Vectors

CAFOs and their waste can be breeding grounds for insect vectors. Houseflies, stable flies, and mosquitoes are the most common insects associated with CAFOs. Houseflies breed in manure, while stable and other flies breed in decaying organic material, such as livestock bedding. Mosquitoes breed in standing water, and water on the edges of manure lagoons can cause mosquito infestations to rise. Flies can change from eggs to adults in only 10 days, which means that substances in which flies breed need to be cleaned up regularly.

Flies are typically considered only nuisances, although insects can agitate livestock and decrease animal health. The John Hopkins Bloomberg School of Public Health found evidence that houseflies near poultry operations may contribute to the dispersion of drug-resistant bacteria (Center for Livable Future, 2009). Since flies are attracted to and eat human food, there is a potential for spreading bacteria or pathogens to humans, including microbes that can cause dysentery and diarrhea (Bowman et al., 2000). Mosquitoes spread zoonotic diseases, such as West Nile virus, St. Louis encephalitis, and equine encephalitis.

Residences closest to the feeding operations experience a much higher fly population than average homes. To lower the rates of insects and any accompanying disease threats, standing water should we cleaned or emptied weekly, and manure or decaying organic matter should be removed twice weekly (Purdue Extension, 2007). For more specific insect vector information, please refer to NALBOH's vector guide (*Vector Control Strategies for Local Boards of Health*).

Pathogens

Pathogens are parasites, bacterium, or viruses that are capable of causing disease or infection in animals or humans. The major source of pathogens from CAFOs is in animal manure. There are over 150 pathogens in manure that could impact human health. Many of these pathogens are concerning because

they can cause severe diarrhea. Healthy people who are exposed to pathogens can generally recover quickly, but those who have weakened immune systems are at increased risk for severe illness or death. Those at higher risk include infants or young children, pregnant women, the elderly, and those who are immunosuppressed, HIV positive, or have had chemotherapy. This risk group now roughly compromises 20% of the U.S. population.

Table 2 Select pathogens found in animal manure.

Pathogen	Disease	Symptoms
Bacillus anthracis	Anthrax	Skin sores, headache, fever, chills, nausea, vomiting
Escherichia coli	Colibacilosis, Coliform mastitis-metris	Diarrhea, abdominal gas
Leptospira pomona	Leptospirosis	Abdominal pain, muscle pain, vomiting, fever
Listeria monocytogenes	Listerosis	Fever, fatigue, nausea, vomiting, diarrhea
Salmonella species	Salmonellosis	Abdominal pain, diarrhea, nausea, chills, fever, headache
Clostirdum tetani	Tetanus	Violent muscle spasms, lockjaw, difficulty breathing
Histoplasma capsulatum	Histoplasmosis	Fever, chills, muscle ache, cough rash, joint pain and stiffness
Microsporum and *Trichophyton*	Ringworm	Itching, rash
Giardia lamblia	Giardiasis	Diarrhea, abdominal pain, abdominal gas, nausea, vomiting, fever
Cryptosporidium species	Cryptosporidosis	Diarrhea, dehydration, weakness, abdominal cramping

Sources of infection from pathogens include fecal-oral transmission, inhalation, drinking water, or incidental water consumption during recreational water activities. The potential for transfer of pathogens among animals is higher in confinement, as there are more animals in a smaller amount of space. Healthy or asymptomatic animals may carry microbial agents that can infect humans, who can then spread that infection throughout a community, before the infection is discovered among animals.

When water is contaminated by pathogens, it can lead to widespread outbreaks of illness. Salmonellosis, cryptosporidiosis, and giardiasis can cause nausea, vomiting, fever, diarrhea, muscle pain, and death, among other symptoms. *E.coli* is another serious pathogen, and can be life-threatening for the young, elderly, and immunocompromised. It can cause bloody diarrhea and kidney failure. Since many CAFO use sub-therapeutic antibiotics with their animals, there is also the possibility that disease-resistant bacteria can emerge in areas surrounding CAFOs. Bacteria that cannot be treated by antibiotics can have very serious effects on human health, potentially even causing death (Pew Charitable Trusts, n.d.).

There is also the possibility of novel (or new) viruses developing. These viruses generate through mutation or recombinant events that can result in more efficient human-to-human transmission. There has been some speculation that the novel H1N1 virus outbreak in 2009 originated in swine CAFOs in Mexico. However, that claim has never been substantiated. CAFOs are not required to test for novel viruses, since they are not on the list of mandatory reportable illness to the World Organization for Animal Health.

Antibiotics

Antibiotics are commonly administered in animal feed in the United States. Antibiotics are included at low levels in animal feed to reduce the chance for infection and to eliminate the need for animals to expend energy fighting off bacteria, with the assumption that saved energy will be translated into growth. The main purposes of using non-therapeutic doses of antimicrobials in animal feed is so that animals will grow faster, produce more meat, and avoid illnesses. Supporters of antibiotic use say that it allows animals to digest their food more efficiently, get the most benefit from it, and grow into strong and healthy animals.

The trend of using antibiotics in feed has increased with the greater numbers of animals held in confinement. The more animals that are kept in close quarters, the more likely it is that infection or bacteria can spread among the animals. Seventy percent of all antibiotics and related drugs used in the U.S. each year are given to beef cattle, hogs, and chickens as feed additives. Nearly half of the antibiotics used are nearly identical to ones given to humans (Kaufman, 2000).

There is strong evidence that the use of antibiotics in animal feed is contributing to an increase in antibiotic-resistant microbes and causing antibiotics to be less effective for humans (Kaufman, 2000). Resistant strains of pathogenic bacteria in animals, which can be transferred to humans thought the handling or eating of meat, have increased recently. This is a serious threat to human health because fewer options exist to help people overcome disease when infected with antibiotic-resistant pathogens. The antibiotics often are not fully metabolized by animals, and can be present in their manure. If manure pollutes a water supply, antibiotics can also leech into groundwater or surface water.

Because of this concern for human health, there is a growing movement to eliminate the non-therapeutic use of antibiotics with animals. In 2001, the American Medical Association approved a resolution to ban all low-level use of antibiotics. The USDA has developed guidelines to limit low-level use, and some major meat buyers (such as McDonald's) have stopped using meat that was given antibiotics that are also used for humans. The World Health Organization is also widely opposed to the use of antibiotics, calling for a cease of their low-level use in 2003. Some U.S. legislators are seeking to ban the routine use of antibiotics with livestock, and there has been legislation proposed to solidify a ban. The Preservation of Antibiotics for Medical Treatment Act (PAMTA), which was introduced in 2009, has the support of over 350 health,

consumer, and environmental groups (H.R. 1549/S. 619). The act, if passed, would ban seven classes of antibiotics important to human health from being used in animals, and would restrict other antibiotics to therapeutic and some preventive uses.

Other Effects – Property Values

Most landowners fear that when CAFOs move into their community their property values will drop significantly. There is evidence that CAFOs do affect property values. The reasons for this are many: the fear of loss of amenities, the risk of air or water pollution, and the increased possibility of nuisances related to odors or insects. CAFOs are typically viewed as a negative externality that can't be solved or cured. There may be stigma that is attached to living by a CAFO.

The most certain fact regarding CAFOs and property values are that the closer a property is to a CAFO, the more likely it will be that the value of the property will drop. The exact impact of CAFOs fluctuates depending on location and local specifics. Studies have found differing results of rates of property value decrease. One study shows that property value declines can range from a decrease of 6.6% within a 3-mile radius of a CAFO to an 88% decrease within 1/10 of a mile from a CAFO (Dakota Rural Action, 2006). Another study found that property value decreases are negligible beyond 2 miles away from a CAFO (Purdue Extension, 2008). A third study found that negative effects are largest for properties that are downwind and closest to livestock (Herriges, Secchi, & Babcock, 2005). The size and type of the feeding operation can affect property value as well. Decreases in property values can also cause property tax rates to drop, which can place stress on local government budgets.

Considerations for Boards of Health

Right-to-Farm Laws

With all of the potential environmental and public health effects from CAFOs, community members and health officials often resort to taking legal action against these industrial animal farms. However, there are some protections for farms in place that can make lawsuits hard to navigate. Right-to-farm laws were created to address conflicts between farmers and non-farming neighbors. They seek to override common laws of nuisance, which forbid people to use their property in ways that are harmful to others, and protect farmers from unreasonable controls on farming.

All 50 states have some form of right-to-farm laws, but most only offer legal protections to farms if they meet certain specifications. Generally, they must be in compliance with all environmental regulations, be properly run, and be present in a region first before suburban developments, often a year before the plaintiff moves to that area. These right-to-farm laws were originally created in the late 1970s and early 1980s to protect family farms from suburban sprawl, at a time when large industrial farms were not the norm. As industrial farms grew in size and number, the agribusiness industry lobbied for and achieved the passage of stricter laws in the 1990s, many of which are now being challenged in court by homeowners and small family farmers. Opponents to these laws argue that they deprive them of their use of property and therefore violate the Fifth Amendment to the Constitution.

Some state courts have overturned their strict right-to-farm laws, such as Iowa, Michigan, Minnesota, and Kansas. Others such as Vermont have rewritten their laws. Vermont's updated right-to-farm bill

protects established farm practices as long as there is not a substantial adverse effect on health, safety, or welfare.

Boards of health need to be aware of what legal protection their state offers farms. Right-to-farm laws can hinder nuisance complaints brought about by community members. State laws can prevent local government or health officials from regulating industrial farms.

Board of Health Involvement with CAFOs

Boards of health are responsible for fulfilling the three public health core functions: assessment, policy development, and assurance. Boards of health can fulfill these functions through addressing problems stemming from CAFOs in their communities. Specific public health services that can tackled regarding CAFOs include monitoring health status, investigating health problems, developing policies, enforcing regulations, informing and educating people about CAFOs, and mobilizing community partnerships to spread awareness about environmental health issues related to CAFOs.

Assessment: Board of health members should ensure that there is an effective method in place for collecting and tracking public complaints about CAFOs and large animal farms. Since environmental health specialists at local health departments are often responsible for investigating complaints, the board of health must take measures to ensure that they are properly trained and educated about CAFOs. It is possible that the board of health may be responsible or choose to do some investigations itself. Schmalzried and Fallon (2008) advocate that local health districts adopt a proactive approach for addressing public concerns about CAFOs, stating that health districts can offer some services that may help ease public frustration with CAFOs. A fly trapping program can establish a baseline for the average number of flies present prior to the start-up of CAFOs or large animal farms, which can then establish if a fly nuisance exists in the area. Testing for water quality and quantity can provide evidence if CAFOs are suspected of affecting private water supplies. Boards of health can also monitor exposure incidences that occur in emergency rooms to determine if migrant or farm workers are developing any adverse health conditions as a result of their work environments. Establishing these programs benefit both members of the community and provide information to future animal farm operators, and local boards of health should recommend them if they've been receiving complaints about CAFOs.

Policy Development: Boards of health in many states can adopt health-based regulations about CAFOs, however, they may be met with some resistance. Humbolt County, Iowa, adopted four health-based ordinances concerning CAFOs that became models for regulations in other states, but the Iowa Supreme Court ruled the ordinances were irreconcilable with state laws. Boards of health that choose to regulate CAFOs can also be subject to pressure from outside forces, including possible lawsuits or withdrawal of funding. Boards of health should also consider working with other local officials to institute regulations on CAFOs, such as zoning ordinances.

Assurance: Boards of health can execute the assurance function by advocating for or educating about better environmental practices with CAFOs. Board members may receive complaints from the public about CAFOs, and boards can hold public meetings to receive complaints and hear public testimony about farms. If boards of health are not capable of regulating industrial farms in their communities, they can still try to collaborate with other local agencies that have jurisdiction. Board of health members can educate other local agencies and public officials about CAFOs and spread awareness about the environmental and health hazards. They can request a public hearing with the permitting agency of the

CAFO to express their concerns about the potential health effects. They can also work with agricultural and farm representatives to teach better environmental practices and pollution reduction techniques.

In many states, boards of health are empowered to adopt more stringent rules than the state law if it is necessary to protect public health. Board of health members should examine their state laws before they take any action regarding CAFOs to determine the most appropriate course of action. Any process should include an investigative period to gather evidence, public hearings, and a time for public review of draft policies.

Board of Health Case Studies

Tewksbury Board of Health, Massachusetts

Locals have complained about Krochmal Farms, a pig farm, for many years, but complaints have increased recently. The addition of a hog finishing facility to the farm coincided with the time that community member complaints grew. Most complaints are centered on the odor coming from the farm. The complaints were originally just logged when phone calls were received; however, the health department added a data tracking system as the number of complaints increased. After a complaint is received, the sanitarian or health director does a site visit to investigate.

The health director in Tewksbury filed an order of prohibition against the farm, which is allowed under Massachusetts law 111, section 143, for anything that threatens public health. The order of prohibition was appealed and the matter was taken to the board of health for a grievance hearing. The board of health hearing included months of testimony about the pig farm. The board of health is also doing a site assignment, which determines if a location is appropriate for treating, storing, or disposing of waste, including agricultural waste. The site assignment process includes both the Department of Environmental Protection (DEP) and the local board of health. The board of health holds a public hearing process, while the DEP reviews the site assignment application. The board of health grants the site assignment only if it is concurrently approved by the DEP.

The health director in Tewksbury points out that the only laws the board of health is able to regulate the farm under are nuisance laws. There have been efforts by the community to do a home rule petition to address the air quality and pest management complaints. The home rule petition is currently working its way through the Massachusetts state house. The status of the petition is unknown.

The board of health has tried to work directly with the pig farm to manage complaints. The farm contains manure composting facilities and the health district has requested advance notice to warn the community before manure is treated or applied to the soil. The farm has adopted a new manure management system. This system uses Rapp technology to control odors and reduce ammonia and hydrogen sulfide levels. However, questions still remain as to whether this addition will fully solve the odor issue. Typically, systems using Rapp technology include an oil cap that floats on manure holding pools and helps seal odors inside. These techniques have been researched and proven to reduce odors. However, the Tewksbury farm did not install the oil cap, and it is unknown whether the exclusion of the cap will hinder the technology's ability to reduce odors.

The complaints about the farm primarily concern the odor that emanates from the farm. The complaints do include mention of health side effects, including nausea and burning eyes. The health director has also heard concerns about potential environmental effects from the pig manure. Community members are

Conclusion

Concentrated animal feeding operations or large industrial animal farms can cause a myriad of environmental and public health problems. While they can be maintained and operated properly, it is important to ensure that they are routinely monitored to avoid harm to the surrounding community. While states have differing abilities to regulate CAFOs, there are still actions that boards of health can and should take. These actions can be as complex as passing ordinances or regulations directed at CAFOs or can be simply increasing water and air quality testing in the areas surrounding CAFOs. Since CAFOs have such an impact locally, boards of health are an appropriate means for action. Boards of health should take an active role with CAFOs, including collaboration with other state and local agencies, to mitigate the impact that CAFOs or large industrial farms have on the public health of their communities.

Appendix A: Regulatory Definitions of Large CAFOs, Medium CAFOs, and Small CAFOs

Animal Sector	Size Thresholds (number of animals)		
	Large CAFOs	Medium CAFOs[1]	Small CAFOs[2]
Cattle or cow/calf pairs	1,000 or more	300-999	Less than 300
Mature dairy cattle	700 or more	200-699	Less than 200
Veal calves	1,000 or more	300-999	Less than 300
Swine (over 55 pounds)	2,500 or more	750-2,500	Less than 750
Swine (under 55 pounds)	10,000 or more	3,000-9,999	Less than 3,000
Horses	500 or more	150-499	Less than 150
Sheep or lambs	10,000 or more	3,000-9,999	Less than 3,000
Turkeys	55,000 or more	16,500-54,999	Less than 16,500
Laying hens or broilers[3]	30,000 or more	9,000-29,999	Less than 9,000
Chickens other than laying hens[4]	125,000 or more	37.500-124,999	Less than 37,500
Laying hens[4]	82,000 or more	25,000-81,999	Less than 25,000
Ducks[4]	30,000 or more	10,000-29,999	Less than 10,000
Ducks[3]	5,000 or more	1,500-4,999	Less than 1,500

Data: Environmental Protection Agency

1 Must also meet one of two "method of discharge" criteria to be defined as a CAFO or must be designated.

2 Never a CAFO by regulatory definition, but may be designated as a CAFO on a case-by-case basis.

3 Liquid manure handling system

4 Other than a liquid manure handling system

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Please share your views below about the impacts of CAFOs, Concentrated Animal Feeding Operations, using this brief questionnaire. It is important we share our stories with the people we have entrusted to make decisions for us.

Name: Robert & Sherry Schettler

Address (street, city, zip):

N9159 Gopher Hill Road Ixonia WI 53036

Email and/or cell phone:

RNSchettler@yahoo.com

Approximate distance from the CAFO: Walking distance less than a mile

How does the CAFO affect your family personally?

Just this Past Sunday Kevin himself was driving a Piece of LARGE farm EQUIPMENT down the Center of Gopher Hill Road at EXCESSIVE Speeds Necessitating us to Pull over until he Passed by. Is he Permitted to Self Police Our Safety on the Roads As well? Today they have been dumping MASS QUANTITIES of the NOXIOUS Smelling "Slurry", with upwards of 4 trucks at a time dumping this onto a field Right next to our home. How Safe is this for my Family. It will be in my yard if it Rains !! What About Our ground water? Who is Protecting us, who is going to cover the Cost for the OBVIOUS testing that Should become Routine. As I write this I can hear Semi After Semi Out there dumping making it dangerous to be Out of doors. Can't even take the dog for a walk !! She is Currently barking incessantly due to the fact She thinks Our Property is being Passed on. How Right she is!

How do you feel the CAFO affects the larger community?

Feel free to attach additional photos/thoughts if you need to!

I did observe Some one Filming todays dumping with a Cell Phone. It was Quite a display. Think tug Boats in the Ocean Spraying it NOT Inspecting it.

Please share your views below about the impacts of CAFOs, Concentrated Animal Feeding Operations, using this brief questionnaire. It is important we share our stories with the people we have entrusted to make decisions for us.

Name: Ryan and Meaghan Kingsley

Address (street, city, zip):

N8990 Ridge Ln, Watertown, WI 53094

Email and/or cell phone:

262-894-8904 tiger53_@hotmail.com

Approximate distance from the CAFO: 600 yards

How does the CAFO affect your family personally?

- contaminate water/well. (arsenic)
- Unable to keep windows open - methane smell too bad
- Hard to breathe outside on certain days
- Our cars get full of poop from the roads when they are hauling poop - gets into our garage & makes it smell.
- ~~Can't take walks outside or even be outside when the smell is too bad.~~
- Lower property value

How do you feel the CAFO affects the larger community?

Hard on the roads

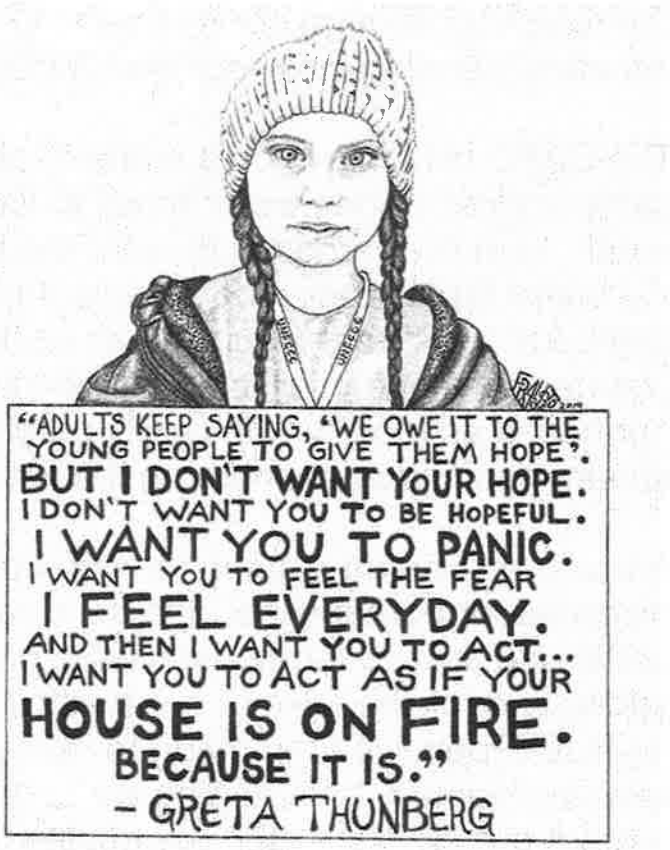
Lower propeirty value

possible water contamination

Feel free to attach additional photos/thoughts if you need to!

Monday, July 18, 2022

My message to the county regarding CAFOs follows. Thank you for making this conversation happen. As you know, this topic has been brought up for many years in various county committee meetings. It is good that we are addressing this together. We, as taxpayers, all sharing this corner of the earth together, need you to hear our voices. Please put my comments on public record and do share the video link with me so I can view the meeting when I am able to!



Janet Foust, MEd, wife, mom, educator trying to make a difference in the world for our daughter, our grandkids, future generations.
W993 Gopher Hill Road
Watertown, Wisconsin. 53094
teach4591@gmail.com

I will explain our experience living in Ixonia with a CAFO across the field from our house. However, my concerns are not germane to this particular CAFO. The ten CAFOs in Jefferson County impact all of us in similar ways.

The CAFO across the field from our house sits on 33 acres. Imagine having excrement for approximately 41, 000 people on 33 acres with

no sanitary district. We have lived through days when we open our backdoor and it is like breathing liquid diarrhea. We have witnessed days when 39 manure semis have flown past the house in an hour from before 7a.m. and many times after 11p.m. for a week or more, stopping quickly at the stop sign to the west and leaving spills along the road, big enough spills to stick to the tires of our vehicles and eventually ending up in our own garage.

The CAFO in Ixonia is on a rechargeable aquifer, using water from the same aquifer whose water flows to Oconomowoc, Delafield, and on south. I am concerned with what the high capacity wells are doing to the water table, about the arsenic that is prevalent in this area and can be brought to the surface when these wells are being used. I wonder how long it will be until we have contaminated well water at our house especially with newly purchased land being used for the spreading of liquid manure on the fields adjacent to our property.

Are we, as a county, going to wait until more people contract diseases, or perhaps die, due to current factory farming practices before we acknowledge we have a problem that needs to be addressed for the sake of our health? Prevention is always easier and far less expensive than trying to heal someone or something that is already infected. I am hoping we can work together to find ways to protect our air, our water, our quality of life for all citizens of Jefferson County.

Here are some action steps that the county could implement:

*Provide annual water testing for residents of the county, all residents. In the past, there have been farm technology days, county fairs where they have provided a station for water testing. We could do that!

*Engage the water resource specialist in testing run-off water after it leaves the CAFO on its way to the impaired Rock River, other waterways in the county. The specialist could work with trained citizens to test the water.

*Monitor the content of the manure lagoons. 10% of the lagoon contents are classified as "other". That includes copper foot bath wash which has been causing copper toxicity on the land, ultimately ending up in animal feed. Manure lagoons can accept barn cleaners, barn waste, PFAS from biosolids, the forever chemicals.

*Use unannounced visits when going to these CAFOs, and have less reliance on the honor system of self reporting.

*Set up monitoring of high capacity wells to protect our water supply for current as well as future generations.

*Use ARPA funds, or similar county funding sources, under the Clean Water Act for covering the manure lagoons and mitigating the VOCs (Volatile Organic Compounds found in particulates in the air which do end up in our waterways), for water testing, both ground and well water, for manure lagoon composition testing, for as many ways as you find to protect our right to clean water.

*Finally, remember that you can always find a way to do something to protect the health and welfare of citizens. You can start by learning the rules and regulations that are in place, like ATCP 51, yes, but then you need to think outside the box and create action items, looking for what can be done. We, as citizens, can help you do that. Since 2008 when the family farm in Ixonia decided to grow and become a CAFO, we have been educating ourselves on all things CAFOs. Use us, hear us, work with us to create a better county for all of us!

Director Chilsen,
Please make sure this is included in the record of the July 20 joint meeting on CAFO's. Thank you. - AR.

Please share your views below about the impacts of CAFOs, Concentrated Animal Feeding Operations, using this brief questionnaire. It is important we share our stories with the people we have entrusted to make decisions for us.

Name: Amy Rinard

Address (street, city, zip):

N8960 Ridge La., Watertown WI 53094

Email and/or cell phone:

amyrinard@gmail.com

Approximate distance from the CAFO: 1/4 mile

How does the CAFO affect your family personally?

1.) odor: at times it is unbearable. This diminishes our enjoyment of our property. 2.) water quality: many years of manure spreading in fields surrounding our home has us concerned for our well water. We are testing at our expense. 3.) noise: 18-wheel manure tankers from dawn until late at night.

How do you feel the CAFO affects the larger community?

As public awareness of water quality grows, fewer people will want to live in Dodge county where water is suspect. This will reduce property values & town tax ~~revenue~~ base, thus increasing tax rates. Quality of life negatively affected by manure truck traffic, pervasive odor of manure. At times entire town seems saturated in manure. The county should offer free well testing & create county-wide water quality database

~~Feel free to attach additional photos/thoughts if you need to!~~

July 20th, 2022

To the Jefferson County Board, Board of Health, Executive Committee, Land & Water Conservation Committee, Planning & Zoning Committee and the Solid Waste Committee:

As a resident of the town of Palmyra, I am very concerned with the number of CAFOS that are being allowed in Jefferson County. I realize that the state took away local control of these, but we need to do something to protect our land, water and other natural resources out here in Jefferson County against their negative impact on all of us .

We all witnessed firsthand this spring and summer the hazards of CAFOS with the avian flu hitting the Cold Spring Egg farm. Anytime you have this many animals concentrated in one area you're bound to have troubles.

We all need to eat, but we must have safety measures in place and follow them to prevent anything like this happening again! To my knowledge there's no safety plan in place with the Egg Farm, and while the federal agencies took over the operation of removing and composting the chickens, I believe they didn't even follow their own protocol for a situation like this.

I live about two miles from the site they used to compost all the chickens and depending on which way the wind is coming from, there are many times I've had to close my windows and can't even be outside to enjoy my own property because of the awful stench!! For those of you who don't believe CAFOS pose a problem, I'm sure any of the residents who live closer to the site would welcome you to come live in their shoes for a day or two to see the detrimental impact this situation has had on their lives and livelihood.

I understand people don't want higher prices at the grocery store, but while the price of eggs at the store may be $3.00 a dozen, we are paying a much higher price in the end for the cleanup of this mess.

Respectfully submitted,

Leslie Ott
N1942 County Road E
Palmyra, WI 53156

Public Comment Sign-In Sheet

Committee/Board Name: Joint Meeting	Date of Meeting: 7-20-22

The Chair may limit the number of persons addressing the Board under Section 3.01(5)(h) to a number determined by the Chair to reasonably represent the views of large groups of persons wishing to address the Board, to prevent repetition. The length of time allocated to any person addressing the Board under Section 3.01(5)(h) shall not exceed 3 minutes unless unique circumstances support the Chair allowing a longer period which may be shortened at the discretion of the Chair, with all public comment confined to a maximum of 30 minutes. The County Board may extend public comment beyond 30 minutes by two thirds majority vote of the County Board members present.

Name (Please Print Clearly)	City or Township	Person or Organization Representing (if applicable)	Agenda Item # or General Comment	Support	Oppose	Do you wish to participate in Public Comment? Yes	No
✓ Weenonah Brattset	Palmyra	Self	CAFO's (Protocol) composting			X	
✓ Marianne Schulz	Palmyra	self	Coldspring Composting			X	
✓ Dave S. Hill	Palmyra	Str/CS Eggs				X	
✓ Kay Braaten	Palmyra	self	Coldspring			X	
✓ Lyle Braaten	Palmyra	self	Coldspring			X	
✓ Ed Cohen	Oconomowoc	Self	CAFO			✓	
✓ Kimberly Wortman	Sullivan	self	Coldspring			X	
✓ Dylan Pasono	Ixonia	self	CAFOs			X	
✓ Tom Steinbach	Germantown	Self + Other	CAFOs + Lo Farm Ofs			X	
✓ Leslie Ott	Palmyra	Self	CAFO			X	
✓ Lisa Casto	On-line					X	

Concentrated Animal Feeding Operations and Human Health in Wisconsin

Curtis Hedman, PhD
Toxicologist

July 20, 2022

Wisconsin Department of Health Services

Aesthetic Challenges of CAFOs

- Various Periodic Nuisances
  - Odors
  - Noise
  - Dust
- Enjoyment/use of neighboring properties
- Changing rural character

Concentrated Animal Manure

- Manure hauling and spreading can cause
  - Public road traffic & damage
  - Nutrient management issues
  - Groundwater & recreational waters impacts
- The amount of land available for manure spreading is a major limiting factor for operation size

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Potential Human Health Concerns

- Manure application can cause pathogens or chemicals within the manure to become airborne and be transported to neighboring yards
- The risk of developing symptoms depends on
  - (1) the presence of harmful constituents in the manure
  - (2) the concentration of the manure in the bioaerosols, and
  - (3) the frequency and duration of exposure

Characteristics of Livestock Manure

- Chemical and microbial composition
  - Varies with livestock source
  - Key microbes in manure management operations: *Campylobacter spp., E.coli, non-typhoid Salmonella, Cryptosporidium, Giardia*
- Storage, handling, and processing affect manure characteristics
- Dominant hazardous air pollutants are hydrogen sulfide and ammonia
  - Many minor chemicals contribute to odor

Chemicals Found in Manure

- Hydrogen Sulfide (H_2S)
- Methane
- Nitrogen Heterocycles
- Mercaptans
  - eg.- Methyl-, Ethyl-, Propyl-
- Volatile Fatty Acids, Alcohols, Indoles, Aldehydes, & Ketones
- Organic acids
  - eg.- Proprionic, Butyric, Isovaleric, Isobutyric
- Metabolites
  - eg.- Hormones, Pharmaceuticals, Supplements
- Ammonia (NH_3)
- Amines (NH_2-R)
  - R = Methyl-, Ethyl-, Dimethyl-
- Nitrate (NO_3)
- Nitrous oxide (N_2O)
- Phosphates (-PO_4)
- Carbon dioxide (CO_2)
- Phenolics
- Sulfides (R-S-R)
  - R = Dimethyl-, Diethyl-

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Hydrogen sulfide (H_2S)


CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™
Search
Advanced S
Morbidity and Mortality Weekly Report (*MMWR*)
CDC
Notes from the Field: Death of a Farm Worker After Exposure to Manure Gas in an Open Air Environment — Wisconsin, August 2016
Weekly / August 18, 2017 / 66(32);861–862

- H_2S cause of lethal accidents in confined spaces containing wastewater
- Stagnant, anaerobic sewage may contain 6000 ppm H_2S
  - Max solubility in water 4000 ppm
- When wastewater is agitated, H_2S may increase production and erupt from solution with pressure to fill confined space

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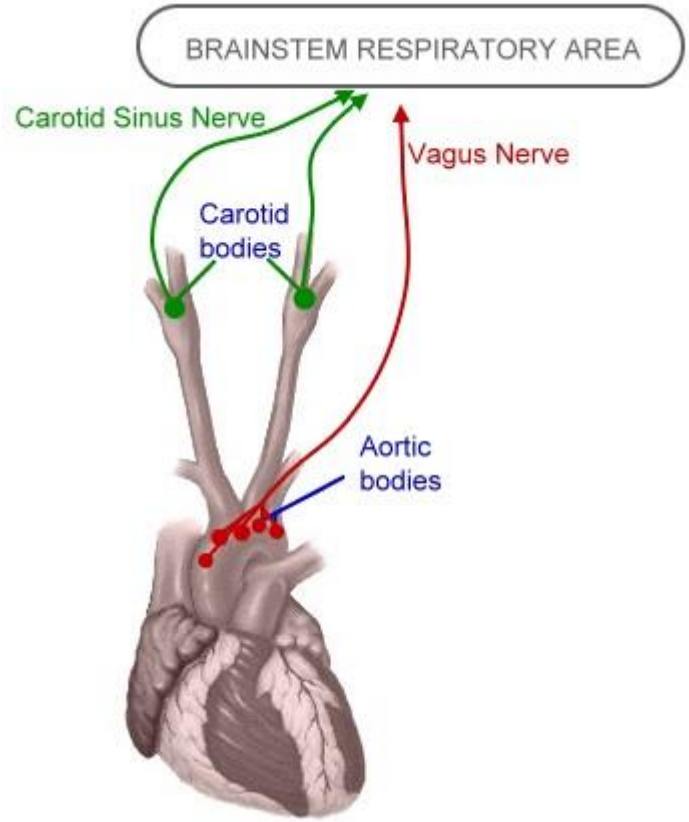
Mechanism of H_2S Toxicity

- **Extremely fast central nervous system and respiratory depression**
- **Halts breathing center of the brain**



-Casarett & Doull's Toxicology

-Irwin and Kirchner Am Fam Physician. 2001 Oct 15;64(8):1379-1387.

-elrinajoubert-huebner.online

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H_2S Toxicity Progression

- Acute, very high concentrations
  - Actual conc. in accidents usually unknown
  - >600-1000 ppm ?: Lung paralysis, collapse, death
- Acute, high concentrations >500 ppm, <1 hr
  - CNS depression, loss of consciousness
  - Recovery; neurological problems may persist
- Acute, lower concentrations
  - 2 ppm: asthmatics affected
  - 150 ppm: olfactory paralysis
- Chronic exposure
  - 0.0002 ppm typical background level
  - 0.3 ppm offensive odor, headache
  - 3-5 ppm very offensive
  - 0.001-0.008 ppb odor threshold (AI HA 1989)

ATSDR Tox Profile http://www.atsdr.cdc.gov/toxprofiles/phs114.html

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Community H_2S Monitoring

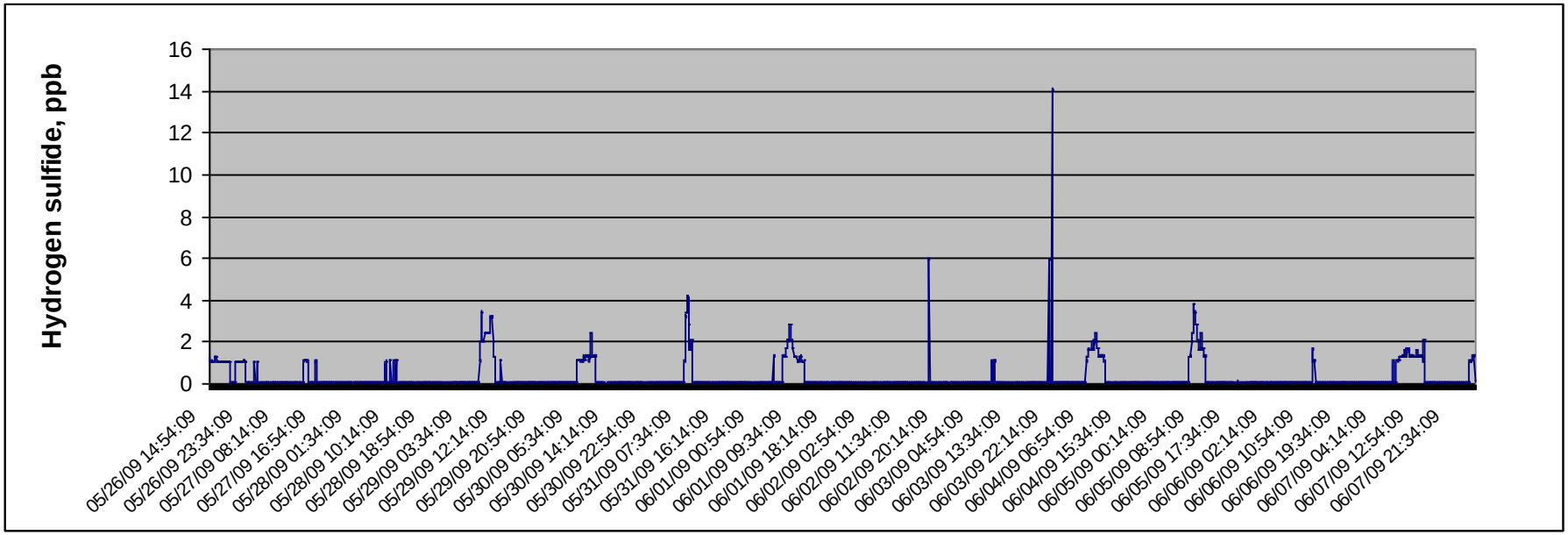

Figure 2. Hydrogen sulfide concentration in air 1950 feet downwind of the AV Roth Feeder Pig farm versus date and time, measured over two monitoring intervals. A: First monitoring period = May 26-June 9 2009; B: Second monitoring period = June 18-July 1, 2009. ppb: parts per billion.

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Ammonia (NH_3) Health Effects

- Ammonia
  - Strong respiratory irritant that can cause chemical irritation to the respiratory tract, skin, and eyes
  - People who are hyper reactive to other respiratory irritants or are asthmatic are more susceptible to respiratory effects of ammonia

Ammonia Effects	mg/m^3	ppm
Detectable odor	0.028 to 37	0.04 to 53
Eye, nasal and respiratory irritation	35 to 70	50 to 100
Severe cough	35 to 105	50 to 150
Reactive airway dysfunction	105	150
Lethal in 30 minutes	1,750 to 3,150	2,500 to 4,500
Immediately lethal	3,500 to 7,000	5,000 to 10,000

Conversion Factor: 1 ppm = 0.7 mg/m^3

mg/m^3 = milligrams per cubic meter of air

Manure Contamination of Residential Wells

- Manure contaminated surface water may travel and mix with groundwater that your well uses or enter the well itself
- All private residential wells tested once a year or more for bacteria (total coliform and *E. Coli*)
  - Test more often if well is at risk of contamination from manure runoff

Health Effects of Microbes in Wells

- Short-term health risk = illness causing bacteria (*E. coli*) and other organisms (*Cryptosporidium, Giardia, viruses*) can be in the water
- flu-like illnesses, leading to diarrhea, nausea, vomiting, cramps, or fever
- Young children, the elderly, and people with weakened immune systems are more likely to be impacted than others

Actions to take if your well has bacteria

- Do not drink the water
- Take a confirmation sample
- If confirmed, disinfect your well
- Take care when cooking and washing dishes
- Monitor your well

Nitrates in well water

- Concern for newborns (blue baby syndrome) or methemoglobinemia
  - Test drinking water annually or if pregnant
  - If nitrate > 10 mg/L, use alternate source, or install a water treatment system
    - Retest to confirm treatment system is effective
- Nutrient management plan should consider aquifer susceptibility

Particulate Matter

- Consists of fecal matter, feed material, skin cells, and products of microbial degradation of feces and urine along with soil particulate
- Bioaerosols, which consist of particles of biological origin that are suspended in the air, are a major component
- Endotoxin, from gram-negative bacteria, is also a component

Particulate Matter Health Effects

- PM2.5 – increased exposure over time can cause premature mortality, exacerbation of asthma and other chronic respiratory conditions, and adverse cardiovascular outcomes
- Organic dust toxic syndrome (ODTS) in agricultural workers causes flu-like symptoms

Particulate Matter Health Effects

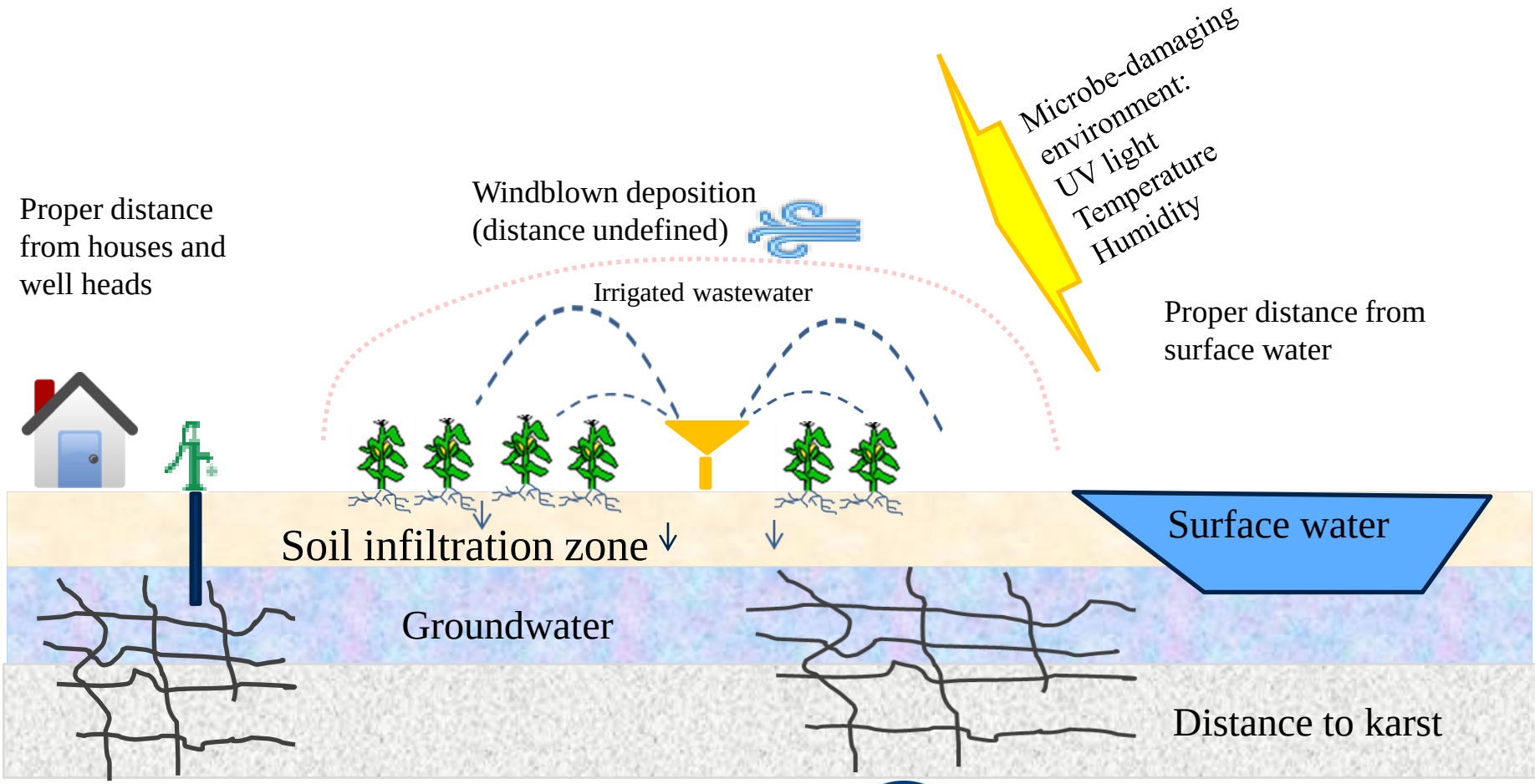
- Asthmatics can be sensitized to allergens in grain dust, dust mites, animal dander, pollen, and others
- EPA PM NAAQs (24-hour averages)
  - PM2.5 = 0.035 mg/m3
  - PM10 = 0.150 mg/m3

Particulate Effects	Ambient Concentration
CAFO Related	
Decreased lung function in poultry workers	2.4 mg/m^3 total dust[a]
Decreased lung function in poultry workers	0.16 mg/m^3 respirable dust[a]
Non CAFO Related	
2.5 to 5% increased mortality*	0.05 mg/m^3 PM10 increase[b]
3% increased mortality*	0.025 mg/m^3 PM2.5 increase[b]
Reversible blood and immune system effects	0.023 to 0.311 mg/m^3[c]

(Donham et al. 2000[a], EPA 2003b[b], Ghio et al. 2000[c])

* For cardiovascular effects, there may be no threshold.

Understanding fate and transport is key to risk assessment



Thiboldeaux 2015

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Best Management Practices (BMPs)

- Nutrient Management Plans
  - Amount of manure spread
  - Timing
- Setbacks from inhabited dwellings
- Pre-treatment of materials to reduce microbial pathogen and chemical load
- Spray droplets greater than 200µm diameter
- Operational weather considerations
- Reduction of nuisance odor and hazardous air pollutant emissions

Public Health Considerations

- Review of local nuisance ordinances
- Mechanism for tracking and responding to public health complaints
  - Odor log
  - Particulate and chemical monitoring
  - Availability of water testing resources
  - Manure spill response plans

In Summary

- CAFOs are regulated under many statues by various agencies
- CAFOs may pose environmental and human health challenges if mismanaged
  - Occupational health considerations
  - Community effects
- BMPs have been shown to reduce human health and nuisance issues

Contact Information

curtis.hedman@wi.gov

(608) 266-6677

Wisconsin Department of Health Services