WISCONSIN
DEPT. OF NATURAL RESOURCES

E/A TABLE

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Concerns for ~~one~~ the wildlife population - birds deer, turkey, etc - where do they go??? We enjoy them all, no matter what it may be. I'd Rather have Skunks than a Smelly, CAFO that is polluting our air & water, soil - Also, what about the Recreation part of it? ~~Does~~ People that live by the lakes (Rome) + Streams won't have the quality they had before - Suppose the people on the lakes that spent their Retirement $ for a peaceful place, will move to Minnesota once their water is shot - (If they can sell it) It will turn into another 3-mile island area! Those →

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: _____

Contact Information: _____

ER

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

The Karner Blue Butterfly has been well documented to be in Wood Co. + the town of Saratoga. If this Dairy project move forward, it is going to affect the habitat for the Butterfly. What can be done to move wd do not lose the endangered species in this area?

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Name: _____

Contact Information: _____

Copy 6 508

Endangered Resources

Central Wisconsin Nature Foundation

August 23, 2012

The Central Wisconsin Nature Foundation humbly requests that the DNR do a complete Endangered Species Inventory for the entire area of the proposed project. The forest is home to a plethora of wildlife, and may contain nests of endangered species.

We have submitted the plot numbers and GIS coordinates of every piece of property for the proposed CAFO and surrounding agricultural fields, to the National Heritage Foundation.

Using the knowledge we have of endangered species in Adams County, along with their information, we are concerned there may be nesting areas for:

Karner Blue Butterfly	Barn Owl
Slender Glass Lizard	Greater Prairie Chicken
Kirkland's Warbler	Persius Dusky Wing Butterfly
Regal Fritillary butterfly	Dusted Skipper Butterfly
Red shouldered hawk	Sand Snaketail Dragonfly
Blandings turtle	Wood Turtle
Bald Eagle	

And many other protected wildlife. It would be a travesty if this project were to go ahead without making sure we do not disturb the endangered species living within.

Regards,

Paul Pisellini

Chairman

WISCONSIN
DEPT. OF NATURAL RESOURCES

E/R

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Karner Blue Butterfly (?)

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: _____

Contact Information: _____

WISCONSIN
DEPT. OF NATURAL RESOURCES

EN / NOISE

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Please address the Karner Blue habitat, also the endangered Lupines, prairie plant remnants such as Big Bluestem, endangered native orchids and the Yellow Warbler.

Also, in addition to the obvious water issues, please address the noise that the farm will make. Fans + digesters are LOUD and 24 hrs a day*. I've lived here 30 years because I like the peace and quiet.

Please look at lights — to not light up the sky. Skeilded, downlights.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

Cushman, Amanda A - DNR

From: Anderson, Russell A - DNR
Sent: Thursday, September 20, 2012 6:48 AM
To: Hershfield, Marc J - DNR; Cushman, Amanda A - DNR; Schaff, Nicholas A - DNR; Pardee, James D - DNR
Subject: FW: Wood Co. CAFO

P Russ Anderson
Environmental Analysis & Review Program Supervisor, Western Region Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711
(*) phone: (608) 275-3467
(*) fax: (608) 275-3338
Website: dnr.wi.gov
Find us on Facebook: www.facebook.com/WIDNR

-----Original Message-----
From: [redacted]
Sent: Saturday, September 15, 2012 4:28 PM
To: Anderson, Russell A - DNR
Subject: Wood Co. CAFO

9-15-12
Russell Anderson
Wisconsin DNR

Dear Mr. Anderson;

I am requesting that these concerns become part of the DNR's Environmental Impact Statement on the proposed CAFO in southern Wood County.

If any or all of the required permits are granted by the DNR to the investors in the proposed "dairy"- -factory farm, I am concerned that:

1) individual landowners wells could go dry due to the high-capacity wells drawing down the town's watertable, Drinkingwater
2) nitrates & pesticides could pollute our wells, Drinkingwater
3) run-off fertilizers & pesticides could run onto our ajoining lands, ultimately get into creeks and streams and pollute the Wisconsin River which is less than 2 miles away,
4) e-coli contamination of the aquifer could occur if the hardpan layer is fractured or collapses due to over-pumping by the CAFO, Drinking Water
5) the loss of trees now in forestland designation could be catastrophic in the long-run (Quoting the great 20th Century environmentalist and U.S. President, " . . . when the trees are gone, the soil must go and the process doesn't take long . . ." Forestry
6) air pollution (methane, ammonia, etc.) from the CAFO's manure reservoir and land spreading practices could be widespread, Air
7) a future "dust bowl" situation (habob) could develop along state highways 13 & 73 if windbreaks

512

are not allowed to be grown after deforestation and before cropping begins,

8) unsightly berms of stumpage from cutover forest lands or illegal burning of said stumpage, Forestry

9) "7 Mile", "10 Mile", and "14 Mile" creeks going dry and the consequent loss of nationally-recognized trout streams, Fisheries

10) related dairy industries, slaughterhouses, and fertilizer plants further polluting the fragile ecosystem of the entire Central Sands area,

11) increased township and county taxes for road repairs, Socioeconomic

12) decreased house and land values and the inability to sell our unattractive properties,

13) the cruelty of CAFO practices on milk cows & their offspring could give the "dairy state" a bad name,

14) the indifference of local & state officials who may be looking to add minimal low-paying jobs to a "Great Recession"-depressed economy could further erode or destroy the recovery, Socioeconomic

15) "big-business" might be allowed to run roughshod over powerless landowners, Socioeconomic

16) state agencies using state statutes to overrule local comprehensive plans whose intent it was to discourage large operations like CAFOs could lead to future lawsuits,

17) anticipated ineffectiveness of CAFO's "self-policing" of environmental concerns (local complaints & violations not handled because state agencies and inspectors have little time to monitor the ever-increasing num ber of factory farms & related industries)

18) the damages and disappearance of a sportsman's paradise (hunting, fishing, ATV trails, dog-mushing areas, horse-riding trails. etc)

19) new CAFO's may quietly increase in size in the near future once they have obtained the initial permits,

20) time wasn't taken to do verifiable environmental-impact studies on what might happen if a CAFO were built on the poorest soil in Wisconsin,

21) impatient investors didn't do adequate research to locate a more advantageous place to build away from a bedroom community of 5500 people living near a larger community of 18,000 (Wisconsin Rapids),

22) any one or a combination of the above destroying the already depressed South Wood County economy thereby leading to an out-migration of young people over the next several decades. Socioeconomic

I, therefore, request that before granting any permission to build that the Wisconsin DNR commission a longitudinal study of communities nationwide where large agricultural "factory farms" have been built. That study needs to address all these concerns plus the issues of increased crime and drug trafficking when itinerant workers with questionable legal immigration status are attracted to an area.

Respectfully submitted,

[redacted]
[redacted]
Nekoosa, Wi. 54457

WISCONSIN
DEPT. OF NATURAL RESOURCES

Fish / Trout Streams

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Concern: Protection of designated trout streams from warmer water which limits oxygen carrying properties of water

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: _____

(Wildlife / Fisheries)

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

This afternoon I boated past ~~the~~ where the ten mile empties in Wisconsin River ~~today~~. There were two muskie fishermen there. I know the local muskie club has planted fish in that location.

Two years ago we were ~~[illegible]~~ canoeing up river in that area and saw an otter family in the ~~ten~~ mouth of the river.

The sand bar directly across is filled every weekend with ~~fam~~ family boater beached enjoying the sand bar beach. The sand bar is shallow enough for small children to wade over wide areas.

Altering the flow and downgrading the quality of this trout stream will ~~a~~ serious impact the use of this natural resource. I am not against CAFO. I am opposed to the location of this one.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

Wisconsin Trout Stream Habitat Management

FISHERY

What's At Stake?

Wisconsin has over 2,900 trout streams, the majority exhibiting some degree of natural reproduction. Their protection and improvement are cornerstones of DNR's trout management program. While all the streams require protection, about 30 percent need some form of habitat improvement. Both the resource and the quality of trout fishing are at stake.

Why Manage Trout Stream Habitat?

Habitat management focuses on the stream channel and its banks. The idea is to create conditions favorable for trout by adding something to the stream or modifying what's already present.

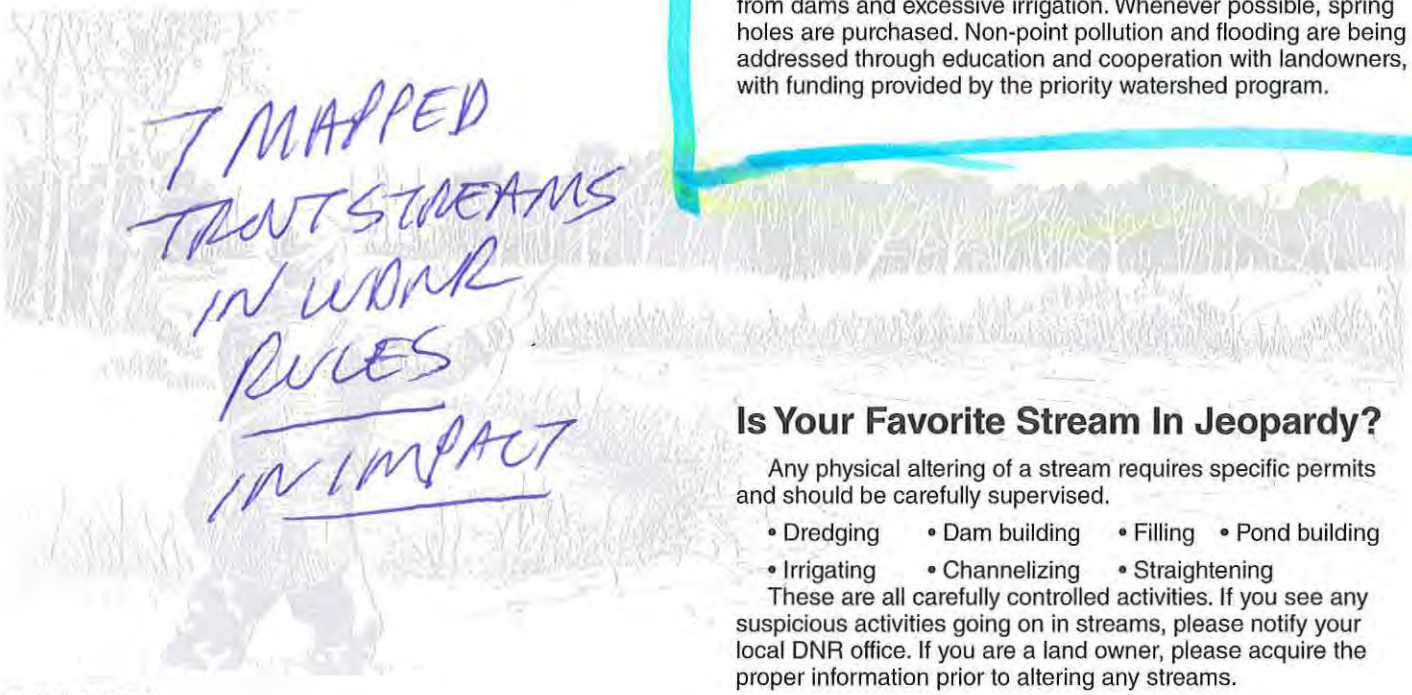
Trout need certain environmental conditions, called habitat, to survive and flourish. Cold water, plenty of oxygen, sheltered places to hide and rest, and abundant supplies of insects and forage fish are the most important. For streams supporting wild trout, add gravel beds for spawning, water swift enough to sweep silt from developing eggs, and half a dozen other factors just beginning to be understood.

Leave out one of these conditions and you may still have a trout stream, but it probably won't produce to capacity. Leave out many more and you can forget about the trout. They won't be there.

Trout streams have been shaped by the forces of nature. No amount of management can make one out of a stream that wasn't meant for it. But management can restore damaged streams. Beaver dams, cattle grazing, highway construction, pollution and floods all take their toll on trout habitat. You can measure the damage in higher water temperatures, caved-in stream banks, turbid water, or number of trout lost.

Habitat management can also make good streams better by increasing the number and size of trout. Some streams have all the required conditions but not in large enough doses. Here, management steps in to find out what's limiting trout production and takes up the slack.

More and better fishing opportunities are the final goal.



I MAPPED TROUT STREAMS IN WDNR RULES IN IMPACT

Illustration by Jim McEvoy

The Trout Stamp

Money was always a problem in the habitat management program. There was never enough to go around. When Wisconsin's trout stamp came along, the situation made a quick turn for the better. Although talked about for over 30 years, it did not become official until 1977. That year, the State Legislature approved the special stamp, with all proceeds going to improve and maintain habitat on inland trout streams. A limitation is that work must pertain to the stream channel and its immediate surroundings. Habitat protection away from the stream is not included.

Management Beyond The Stream

Streams are where the trout are and where the fishing is, too. But good management requires looking beyond the stream, often miles away, to the land that surrounds it, the watershed. What goes on there can have a profound effect on the stream and its trout population.

Pollution is a major concern, and much of it is a kind that can't be traced to any specific source. This is called non-point pollution. Agricultural chemicals, manure, silt and oil residues are examples, entering streams as runoff from farm fields, feed lots and highways. Trout can be affected directly through their body metabolism or indirectly, through deterioration of their habitat.

Flooding is also a problem, especially in hilly southwest and west central Wisconsin. Being the low point in a watershed, streams receive all rain that isn't trapped on the land. Land denuded of natural vegetation or improperly farmed will send this water gushing to the stream, often with disastrous results.

Too little water poses problems of a different sort. The springs, feeder streams, runoff and groundwater that supply trout streams are critical to their health. Both quantity and temperature of the water are important. Dams that cut off water or heat it up can mean big trouble. So can irrigation.

Although not funded by the trout stamp, watershed management is a high priority within the DNR. It takes several forms. DNR's permit system protects trout streams and their feeders from dams and excessive irrigation. Whenever possible, spring holes are purchased. Non-point pollution and flooding are being addressed through education and cooperation with landowners, with funding provided by the priority watershed program.

Is Your Favorite Stream In Jeopardy?

Any physical altering of a stream requires specific permits and should be carefully supervised.

- Dredging
- Dam building
- Filling
- Pond building
- Irrigating
- Channelizing
- Straightening

These are all carefully controlled activities. If you see any suspicious activities going on in streams, please notify your local DNR office. If you are a land owner, please acquire the proper information prior to altering any streams.

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

fish

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

I have researched and read about a number of fisheries which have been dried or ruined by high capacity wells. I can't believe with all this history the DNR can allow this to happen to the 7mile, 10 mile water.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

FISH
PESTICIDES
TOURISM

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

WHAT ABOUT FISHING WHEN ALL CREEKS ARE 3" DEEP?
WILL THIS DROP THE LAKES AROUND HERE?
CAN MY GRANDSON & DOG GO OUTSIDE WHEN THEY'RE SPRAYING?
(X) WHAT ABOUT THE HORSES & ALPACAS THAT EAT GRASS DAILY? WHEN THE PESTICIDES ARE SPRAYED WILL IT HURT THEM? >
WILL THE TOURISTS COME UP HERE DURING THE SUMMER IF OUR LAKES & WOODS (FOR NOW TO BE FIELDS) ARE CONTAMINATED? >
I WORK FOR A RESTAURANT THAT >

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Name: [redacted]

Contact Information [redacted]

SURVIVES ON SUMMER BUSINESS.
IF THIS IS ALLOWED, THERE WILL
BE NO SUMMER BUSINESS. EVERY
ONE COMES UP HERE FOR FISHING,
HUNTING, BOATING, CAMPING & JUST
TO GET AWAY FROM CITY (INDUSTRY)
LIFE. TAKE OUR STREAMS, LAKES,
RIVERS & TREES AND THERE IS NOTHING.

(AC) Fisheries
Water Quantity

Holy

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

I live on the 10 mile Creek next to your lot on Silver Creek Trail. Please come over to my house and take a good look at the Creek from my deck. The nice deep hole that used to be a great spot for fishing is just mud. Where did the water go?

Madison operates with 23 deep wells with 878 miles of water mains that provides water service to more than 62,000 locations in city & town of Madison, Shorewood Hills, Maple Bluff, Blooming Grove, and town of Burke.

The dairy company would 49 wells – Why?

It takes 2,000 gallons of water to produce 1 gallon of milk. What in the world would happen to our water table?

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Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

Fish

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Please protect our fish
and streams from the rich + WALKER

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

Fish
H2O levels

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

I have property on the Five Mile Creek. It has had reduced flow since the Wisconsin Rapids municiple well went into operation. There are still "some" trout in the water along my property. The trout population is significantly lower than the pre-well years. My opinion is that reduced water levels have altered holding capacity. I fear further upstream pumping of high capacity wells will further reduce and possibly completely eliminate trout from the section of stream on my property

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

Forestry

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

I am very concerned about the cutting of this huge acreage of forest land and the impact that has on the environment.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

RECEIVED
SEP 04 2012
DEPT OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

I am very concerned about the cutting of 6000+ acres of forest land/woodlands. This is an area that is used for recreational purposes including: biking, hiking, snowmobiling, horseback riding, ATVing, hunting, trapping, fishing, cross country skiing, etc. The cutting will take away tourism for the area.

Trees serve as natural cleansers of water, filtering out pollutants and stabilizing the soil. They also take in carbon dioxide and give off oxygen.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

Wildlife

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Concern: Deforestation and its effects on wildlife

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: _____

DG

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Section III Water issues

Is it possible to irrigate directly from the Wisconsin River?

Is this a possible solution to save our streams and wells/groundwater?

~~Does~~ The water pumped from groundwater via irrigation does not enter the streams or river. (Wisconsin states 70%, other states claim 100%) So, why not pump directly from the Wisconsin River?

If pipeline costs/easements are too expensive, is it in the Town of Saratoga's best interest to help with the Cost?

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Name: [redacted]

Contact Information: [redacted]

groundwater (AC)

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

We have good water in Saratoga and if this farm Comes in and our water go bad are they gonna put in new wells and filtration Systems for all of us. I can't understand how the People that own the farm or the DNR if they grant the permits would want to put 5,000 or more people out of good water that alot of us have had for years. We don't have a water Softener or filteration System at our house but you would force us to having to do this. For Once I hope that the DNR would listen to the people about what we want and not big business.

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Name: [redacted]

Contact Information: [redacted]

Water Res

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

If wells are permitted can the number of systems the wells supplies be set to multiple systems. That would limit water pumped. one well per sytem can pump at the same time

1 well | 0 | 0 | 0 | 0 | 4 sytems | 1-well pumping 500 GPM for 24 Hours = 720,000 gal

4 wells 4 systems 4 well pumping 500 GPM for 24 Hours 2,880,000 gal

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

DG

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

1) If the DNR tests the CAFO's wells, and these wells are deep (say 150') the tests could come out ok for nitrates, yet a sand point well nearby at 25' could be thooroughly contaminated correct?

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

D4

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

As a landowner, we want the EIS to specify how we will be wholly compensated if we should need to replace our existing well should groundwater levels decrease.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

wells
Forestry

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

S. Hollywood Dump Site water Drilling point. Within so many feet of it. How far can they drill there point to that dump site.

(*) tree removal + growing on pipe Line areas.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

531

Rhonda Cain-Carrell

From: [redacted]
To:
Sent: Thursday, August 23, 2012 2:02 PM
Subject: Re: My letter that will be submitted toady

Five years ago in July, we moved back to the Town of Saratoga where my husband grew up, from the Town of Rome, Lake Camelot. We came here to "live our dream" which includes running my lifelong business on our 10 acres. Saratoga's choice to develop & pay the state of Wisconsin $100,000 for the Comprehensive Smart Growth Plan solidified our conscious choice to be here. The plan allows us to have a non-invasive business (to our neighbors) on our property & preserves our groundwater & forests. We want to grow old here.

After living in Hancock & Rome, we were forced to deal with the issues of overdevelopment of agriculture around our homes. The Hancock home is now abandoned because the water is polluted with nitrates, bacteria & other things that make it unfit for human use. In Rome, our municipal wells have been contaminated with nitrates. We knew where it was coming from, but no one stopped it. Rome has spent an incredible amount of money finding suitable water. They cannot & should not have to go through this again. I do not want municipal water here in Saratoga. There is no reason for even thinking about possibly allowing ANYTHING to compromise our water...water is a resource that cannot be taken for granted...it NEEDS to be protected. Historically, CAFO's are a tragedy for places they site. This proposed CSD has chosen a highly populated rural community with HIGHLY susceptible soil & water, as far as contamination go. The DNR says so. THERE IS NOTHING THAT CHANGES THOSE FACTS. We have cherished our water, streams, wildlife & wooded country living, knowing these gifts were protected by our PLAN. Please uphold this & PROTECT us. Our fate is in your hands. I do not leave our property most days, as my work is here on the premesis. I will have nowhere to go to get away from this. This IS NOT MY DREAM. This could potentially ruin my lifelong business. If my water quantity & quality are compromised, I AM OUT OF BUSINESS. If the air quality is compromised, I will lose my clients, many of whom are elderly & have compromised immune systems. THIS CANNOT HAPPEN. I have worked my entire life to have this thriving business.

I, myself, had an auto-immune event occur when we lived in Rome. At the height of the water contamination, I became paralyzed & had to learn how to walk & use my hands & arms again. Dr.'s had to administer immuno globulin, brought in from another state, through a pick-line to try to combat what was happening in my body. I have recovered, with some neurological deficit, but am able to live my life normally for the most part. I had hives for 12 yrs. every day of my life until shortly after we moved here. Since the article appeared in the newspaper that Wysocki was doing this, I have not slept more than 5 hours a night...most nights 2 or 3, I have lost over 25 lbs. & and have anxiety. We came here for a reason. Wysocki's plans for this dairy are not part of that plan...nor are they part of the town's Smart Growth Plan. I cannot worry every time I take a glass of water (about 10 per day) that maybe I shouldn't do that since I hadn't had my water tested recently enough...& it was thawing, or we had significant rain, or because of a certain smell we knew a process was taking place with landspreading, etc. THIS IS NOT ACCEPTABLE TO EVEN THINK IT IS A POSSIBILITY.

The land that Plum Crek owns ALL around us has been an asset our whole lives...now it is potentially threatening our lives. I live about 1 mile from the proposed dairy site. The proposed fields are accross the road (north), south,east & west of my home & business. The statistics are not good. I have been researching ever since this BOMB dropped on us in June. My research will be submitted, along with the group I have been researching with, in September. Please DO NOT ALLOW THIS. WE need to be able to go on living our lives, sleep & know that MY RIGHTS are protected. This land is all around our home...there is nowhere to go to get away from the potential air & water issues. Our neighbors put their home up for sale as soon as they heard this was proposed. The realtor said their property had been devalued by at least $75,000 with the announcement of this dairy project. They have abandoned their home & are willing to let it go back to the bank if it can't be sold. No one is looking at it & it's an amazing property. PLEASE look at what historically happens around CAFO's. Please DO NOT LET THIS

532

HAPPEN TO US.

[redacted]
Wisconsin Rapids, WI 54494
[redacted]

>
>
>

WISCONSIN
DEPT. OF NATURAL RESOURCES

wells / CUMULATIVE

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

- How many high capacity wells are located within a 10-mile radius of the GSD CAFO? Are there any studies of the effect of drawing ~~of~~ thousands of gallons of water per minute cumulatively on the aquifer? How much can the aquifer sustain before it is adversely affected?

- If there is a severe drought, can the CAFO continue to use the same amount of water? Can a contingency be written in the permit to limit the water usage in cases of adverse weather?

-- How does the DNR know if Consogro (paper mill effluent) is applied on top of manure to cover up overapplication?

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

DG

[redacted]
Wisconsin Rapids, WI 54494

Comments on Golden Sands:
Thinks the company should look at drilling one very deep well, put up a water tower and then pump water out to irrigation systems. Wants Wysocki's/DNR look into alternatives to drilling 49 wells and use less wells and more storage devices.

Feels the manure should be pumped into the ground and not spread. Wants study done on which would do less damage to environment.

Comments received via phone call to Kris Johansen on 8/24/12.

WISCONSIN
DEPT. OF NATURAL RESOURCES

wells
LIABILITY

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

If the DNR issues Golden Sands Dairy well permits, who will be responsible for well water levels droping if I run out of water and have to get a new well. Who will be responsible for the nitrates that will have ~~an~~ a impact on our water.

(*) Will the DNR be open for ~~town~~ Town Suites by the people of Saratoga when this happens and be responsible, or will it be Golden Sands Dairy. Some one should be responsible.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

Gerein

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Concern
Further degradation of already fragile
Soil, wind water, ground water

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: _____

copy

DG

Since there is a clear and present danger to the quantity and quality of our water supply. We request that Wysocki Farms be required to drill test wells at the CAFO site and on adjacent agricultural land, prior to construction, to give the community a baseline for future water testing.

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> CommissionerTom Deckow
> Commissioner Don Fornasiere
> Commissioner Betty Havlik
> Commissioner Don Ystad
> Water Utility Manager Chad Ziegler
>
> CC: Glen Falkowsky [WINDOWS-1252?]– DNR
> CC: Town of Rome Supervisors
> --
> [redacted]
>
> [redacted]

>
> August 16, 2012
>
> Mr. Dan Baumann
> Regional Director WCR DNR
>
> Mr. Baumann,
>
> We, the commissioners of the Town of Rome municipal water utility, would like to voice our opposition to the proposed Wysocki CAFO just upstream from us in the Town of Saratoga. Our wells are about two miles from the project being proposed, and scientific evidence offered up by Dr George Kraft of UWSP, Professor Robert Glennon of the University of Arizona, and other experts, suggests we are extremely vulnerable to water quality and quantity issues resulting from the proposed high capacity wells, concentrated animal feeding operation, and large scale agriculture operation.
>
> [WINDOWS-1252?]We've already experienced the effects of high nitrate levels, being forced to purchase additional property and drill new wells at 85 feet a few years ago. Our original two wells were within two miles of an irrigated ag operation. Although we could not prove it at the time, we suspect nitrate leaching into one of our wells from the ag operation in 1995. The nitrates rose to 16.2 PPM in one of our wells and we were forced to add mains at a substantial cost to mix the two wells. We spent $621,313 between 1995 and 2001 to connect the wells and drill an additional 20 test wells looking for good water in suitable soil. Since that time, we have spent an additional $1,618,260 purchasing additional property and drilling two new wells, and adding required filtering equipment and related infrastructure. [WINDOWS-1252?]We've been told that if nitrates leach into our newer wells, we would need additional filtering equipment at the cost of $2,000,000. Not only does this proposed CAFO pose a threat of contamination of our existing wells, the high potential of water quality and quantity issues resulting from the CAFO limits our ability to drill additional wells and expand our service to the north and west in our town as demand for municipal water grows in our town.
>
> The Town of Rome has 7,046 properties with a total valuation (2011) of $698,344,500. Our utility serves all 7,046 properties in the Town of Rome for fire protection, and provides drinking water to approximately 1,000 residences at this time. As a municipal water utility, we test frequently for water chemistry and water levels, under DNR supervision. Our new wells are free of nitrates and we plan to do all that we can to insure they stay that way. [WINDOWS-1252?]We've invested millions of dollars in this utility to provide safe drinking water to our citizens. We hope the DNR and any other agencies involved will consider the risk to our community this CAFO would represent if it were approved.
>
> Commissioner Tom Birch

8/21/2012

WISCONSIN
DEPT. OF NATURAL RESOURCES

DG

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

How can 45 Hi cap. wells be put in between 2 streams with out having an effect on level of water in ~~stream~~ that Both empty out into the Wisconsin River.

how can the DNR ~~[illegible]~~ allow this to happen to the residents in the area to have their water levels drop and to be contaminated to where they can't drink it.

This is not a farm going in its a factory!

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: _____

Contact Information: _____

WISCONSIN
DEPT. OF NATURAL RESOURCES

D9

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Will an analysis be done on the Cumulative Total of Water Withdrawn from the aquifers To determine The effect of The withdrawl of 33-66 million gallons perday from the water supply?
What distance well be drawn from as an effect of the Total quantity of water used?

[redacted]

WPDES
GNOTHP

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Could we request multiple gauges station to monitor flow, dissolved oxygen, and other chemical attributes of the 7 and 10 mile streams?

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: _____

WISCONSIN
DEPT. OF NATURAL RESOURCES

ALTS

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

① With all the acreage available to the west of the existing CAFO in the Town of Armenia (going as far west as the Finley Bombing Range + Highway 80) why didn't the existing CAFO's owners try to buy land there instead of in a densely populated Township like Saratoga which sits on the porous Plainfield Sands?

I think not enough research was done by the proposed CAFO permittee. Tell him to go elsewhere!

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

ALTS

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

~~This land has been zoned as "recreational" in~~
~~I am concerned that there will not be people~~
~~and~~

Please look for an alternate location like out by their other farm in Armenia, not in a residential area here.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

To Whom It May Concern:

I, Dan Baumann, or the DNR representation who signs below, has received two files of requests on behalf of the group Protect Wood County regarding the proposed Golden Sands Dairy in the Town of Saratoga, Wisconsin.

File Number 1: Blue Folder

Title: Setbacks and Liquid Manure Spreading of Bacteria

Contents: Letter stating the requests
Four articles in support of the requests.

File Number 2: Green Folder

Title: Concrete Manure Lagoons

Contents: Letter stating the requests
Three articles in support of the requests.

These two folders were submitted by: [redacted]
Wisconsin Rapids, WI 54494

Received this day, August 23, 2012 At the Saratoga Town Hall scoping meeting by:

We recently spoke with a Wood County engineer. We had some concerns about the proposed manure lagoon and he was willing to listen. There are three things he suggested that the DNR could require of Wysocki to minimize contamination by the manure lagoon.

Just like in the article enclosed, he told me, "I know of two types of concrete. Concrete that has cracked and concrete that is going to crack." He suggested the DNR require that monitoring wells be placed around the lagoon to check for leaks. He explained that once a leak has formed, the pollution would quickly show up in the test wells.

Because concrete usually fails at some point, the DNR could require a secondary clay liner around the concrete that would further protect the groundwater, since our sandy soil is so porous. He recommended it be 3-feet deep underneath the lagoon and 5-feet wide on the sides. Clay would also help support the concrete from the pressures of the manure inside. In fact, he said that if the cement lagoon were to spring a leak, the clay would hold the liquid in to the extent that, even after 30 years, that liquid would only have penetrated about 1-inch into the clay. I find that remarkable!

The project engineer on the dairy is from Middleton. How often will he be coming up here? Will he be present during the entire construction? With that distance, it's doubtful. If the waterstops are not put in correctly, they will not stop a leak should one form. The third suggestion is to require a second, private consulting firm. He suggested Neumlin in Stevens Point or Maxium in Wausau who could be here each day inspecting the work being done. Since these firms are located nearby, perhaps Wysocki has hired them in the past. In this case, it would be good to have someone Wysocki has not had dealings with.

All three of the articles we've submitted to you mention the need for proper construction and the need to seal the lagoon completely because of our sandy soil and the risk of contamination. We hope you will consider these suggestions and require that Wysocki implement them at his new dairy.

[redacted]
Protect Wood County

Highlighted and Summarized Articles
On Concrete Manure Lagoons
Submitted by
[redacted]
Protect Wood County

Letter of Requests to DNR at August 23, 2012 Meeting Re: Golden Sands Dairy

Index

Article I: Do Lagoons Ever Leak?
Manure: Myths and Facts

Article II: Lagoon Management
PIH-62 by 8 Authors

Article III: Complete Pit Construction: A Commonsense Guide For Producers And Builders
Feldmann & Associates

Do Lagoons Ever Leak?
Manure: Myths and Facts

"All lagoons, storage ponds, or holding tanks leak to some extent."

"Leakage from earthen lagoons is highly dependent on the foundation soil materials".

"Fine-textured soils such as clay tend to leak less than coarse-textures soils."

"Membrane or synthetic liners and tanks constructed of concrete or steel are not leak-proof."

"Concrete tanks are subject to cracks."

primarily by single-family households for waste disposal before the technology of septic tanks and drainfield trenches was implemented.

ISSUE 9: Do lagoons ever leak ?

RESPONSE: All lagoons, storage ponds, or holding tanks leak to some extent. The extent of the leakage from earthen lagoons is highly dependent on the foundation soil materials. Fine-textured soils such as clay tend to leak less than coarse-textured soils.

Liners are required in coarse-textured soils to minimize leakage. Manure solids covering the bottom and sidewalls tend to reduce the leakage but do not form a complete seal. Lagoons when first built may leak more than they do after these manure solids begin to plug the soil pores. Properly installed liners required during the 1990's reduce this leakage to a level considered to prevent contamination of the groundwater.

Membrane or synthetic liners and tanks constructed of concrete or steel are not leak-proof. Geomembranes on a soil base can leak at the seams or at punctures during or after installation. Concrete tanks are subject to cracks. Metal tanks are subject to corrosion.

ISSUE 10: Are lagoons deliberately designed to maximize the emission of ammonia into the air ?

RESPONSE: NO. The only design criteria for the treatment co lagoon is based on BOD or Volatile

Lagoons can

Lagoon Management
PIH-62 by 8 Authors

"Lagoons must be sealed to prevent seepage that would lead to groundwater contamination."

"It is critical that lagoon seals be adequately maintained."

"A lagoon can be sealed with properly installed clay or an industrial liner."

"Sites where the bottom of the structure would be in sand or within 10-feet of limestone should be avoided".

"However it may be possible to seal the bottom with…a swelling-type clay".

Facts to consider: "the presence of soils with sufficient clay to (to be able to) seal".

"It is extremely difficult to predict nutrient concentrations before pumping lagoons. It is essential to match nutrient application with agronomic uptake to avoid excess nutrient application that could result in water contamination."

MANURE MANAGEMENT

PIH-62

Lagoon Management

Authors: Lawson M. Safley, Jr., North Carolina State University

Charles D. Fulhage, University of Missouri

Raymond L. Huhnke, Oklahoma State University

Don D. Jones, Purdue University

Reviewers: Glenn A. Church, H, Iowa State University

Albert J. Heber, Purdue University

James A. Moore, Oregon State University

Ronald E. Hermanson, Washington State University

Introduction

A lagoon is a basin, typically earthen, used to treat and store manure from pork production facilities. A lagoon appears similar to an earthen liquid manure storage; however, it serves the added function of dilution and treatment. The difference is in the length of storage, in the amount of dilution added, and in the fact that a lagoon is never completely emptied. Lagoons are used extensively in the United States. They rely on bacteria to stabilize organic material. Most lagoons used in the swine industry are either anaerobic (bacteria existing in the absence of oxygen) or facultative (combination of anaerobic and aerobic bacteria) treatment units. However, in lagoons considered to be facultative, free oxygen is rarely found below the top few inches of liquid. Aerobic lagoons (bacteria requiring oxygen) also can be used to treat swine manure. However, some means of mechanically supplying the oxygen is typically required.

The lagoon can be used in a variety of manure treatment systems. Properly designed and managed lagoons have a number of attractive features:

- stabilization and reduction of organic matter
- reduction in concentration for some nutrients
- adaptability to a wide range of climatic and topographical situations
- compatibility with liquid manure handling and or collection systems
- reasonable capital and operating costs
- reasonable management requirements
- infrequent sludge removal
- somewhat tolerant of shock loading.

Lagoons are especially compatible with hydraulic flush manure removal and pit recharge systems. Many pork production systems recycle lagoon effluent as the flush or pit recharge liquid.

Before selecting or finding a location for a lagoon, the entire manure management system (manure collection and transport, lagoon, land application equipment, crops and land to receive lagoon nutrients) should be planned and evaluated. If any of the elements do not support the complete design, either an alternative site or an alternative manure management system should be considered.

Lagoon Design

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Lagoon Design Standards

Lagoons treat manure biologically with several types of bacteria working together to decompose organic material. The rate of bacterial decomposition is governed by lagoon temperature. The long-term rate of manure addition to a lagoon should not exceed the rate at which stabilization can occur. The rate that lagoons can reasonably treat manure is termed loading rate. Loading rate can be defined as the amount of manure that will be added per volume of lagoon per day.

Lagoons must be designed to meet a predetermined loading rate criteria. The loading rate for anaerobic lagoons can be expressed as:

1. pounds of volatile solids per cubic foot of lagoon volume per day
2. pounds of chemical oxygen demand (COD) per cubic foot of lagoon volume per day or
3. pounds of live animal weight per cubic foot of lagoon

Anaerobic lagoon loading rates vary throughout the United States as a function of mean annual air temperature. As temperature increases, loading rates can increase because the bacteria are more active and can treat larger quantities of manure. This defines the minimum design volume for an anaerobic lagoon. A final anaerobic lagoon design must include this volume plus additional volume to store manure, accumulated sludge, precipitation and lot runoff for desired amounts of time.

Several anaerobic lagoon design procedures are in use in the United States. These include American Society of Agricultural Engineers (ASAE) Engineering Practice 403.1, USDA Soil Conservation Service Practice 359 and design procedures developed by individual state Cooperative Extension Services. It is advisable for producers to seek professional assistance from someone who is familiar with local conditions and regulations before designing and locating lagoons. This service may be provided by your Cooperative Extension Service, USDA Soil Conservation Service or consulting engineers.

The aerobic lagoon design is based on the amount of oxygen required to stabilize the organic material in the manure. One often used rule is to supply sufficient oxygen through mechanical aeration to satisfy 50% of the daily COD inflow. Design of mechanically aerated lagoons should be left to experienced professionals. Aerobic lagoons without mechanical aeration require a very large surface area in order for sufficient natural aeration to take place, and usually they are not economically feasible.

Consequences of Inadequate Design

If lagoons receive more manure than the bacteria are capable of "digesting," significant odor and rapid sludge accumulation will occur. During winter, biological activity in anaerobic lagoons is dramatically reduced. In warmer seasons, bacteria must digest the undigested portion of manure added during the winter plus the manure being added in the summer. This situation can lead to temporary lagoon overload and objectionable odors in the spring. It is a good practice to be conservative when designing anaerobic lagoons. Some excess capacity is desirable. As herd size is increased, lagoon capacity should be increased as well.

Need for Permits

States may require permits for lagoon construction and/or operation. Always check with the appropriate regulatory agency in a state before lagoon construction. Several states have established criteria for lagoon design volume and construction. Some states require verification of lagoon sealing before initial operation.

Multiple Stage Lagoons

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Anaerobic lagoon systems can be designed with either single or multiple stages. Either design practice is acceptable under certain circumstances. Advantages for multiple stage lagoons include:

- Less floating debris on the second or third stages. This can reduce the potential for clogging flush recycle and irrigation pump intakes and irrigation sprinklers.
- Maintenance of a fixed minimum design and sludge storage volume in the initial cell if recycling and effluent removal are accomplished from second and third stages. This can help ensure that the lagoon system is never "over pumped" and that an adequate concentration of bacteria is present to treat incoming manure. This allows a more stable operation which helps to minimize odors.

Disadvantages of multiple stage lagoons include:

- Increased surface area for a given lagoon depth and volume
- Increased construction cost
- Potential for overloading the first cell which can lead to odors.

The need for multiple stage lagoons can depend on the amount of precipitation, the relative frequency for removing excess lagoon liquid and the intent of recycling lagoon liquid as flush water. Many operations in the Southeast only use single stage lagoons since precipitation is high and need for liquid removal is frequent. The dilution/removal process develops a reasonably clean recycle liquid. In some locations, two and even three stage lagoons have been used to an advantage. In three stage lagoons, the first stage is designed as the primary treatment unit. This cell is designed for stabilization of organic material or odor control. A relatively small, second-stage, constant-volume, constant-head cell serves the function of containing a supply of reasonably clean recycle liquid (most of the floating scum retained in primary lagoon). Excess effluent from the second cell flows into the third stage. The third stage is primarily a storage lagoon and liquid is periodically removed for land application. The third stage should have sufficient volume to store all lagoon system inputs (manure addition, precipitation, etc.) for a selected amount of time.

Sealing Lagoons

Lagoons must be sealed to prevent seepage that would lead to ground water contamination. A lagoon is considered sealed m most states if its lower boundaries (bottom and sides) have a hydraulic conductivity not greater than 10 -7 cm/sec (0.0034 inches/day). A lagoon can be scaled with properly installed clay soil or by using an industrial liner. Appropriate state regulatory agencies should be contacted before lagoon design and construction to determine lagoon sealing requirements. Some states require verification of lagoon seal and/or a leak detection system. It is critical that lagoon seals be adequately maintained. Access by livestock to lagoon banks should be prohibited.

Livestock manure is a good soil sealant (except in very coarse sand or gravel); nevertheless, try to locate the lagoon in the most impervious soil. Cooperative Extension Service or Soil Conservation Service personnel can help you determine a soil's suitability for lagoon construction.

Sites where the bottom of the structure would be in sand or within 10 feet of limestone should be avoided. However, it may be possible to seal the bottom with plastic liners, a swelling-type clay, 6 inches of compacted topsoil or 4 inches of disked-in livestock manure. Also, if located in a high water table or shallow soil area, consider constructing lagoon above grade.

Site Factors to Consider

Lagoon location is one of the most critical aspects of successful lagoon operation. A considerable amount of thought should be given to the design and siting of a lagoon. Because anaerobic and facultative lagoons can

produce objectionable odors on a seasonal basis, they should be located with appropriate separation distances from residences, schools, businesses, churches and other places of assembly. In some situations visual (vegetative or structural) barriers should be installed. The following is a partial list of factors that should be considered:

1. Geology and soil type, depth to water table, depth to bedrock, proximity to karst limestone areas. Proximity of groundwater, and the presence of soils with sufficient clay to seal and provide a barrier against seepage to groundwater are important considerations in locating a lagoon.
2. Sufficient land area and cropping systems to accommodate the nutrients to be periodically remove.
3. Type of agriculture in vicinity.
4. Proximity to residences, wells, streams, ponds, churches, schools and businesses.
5. Visibility of lagoon by neighbors and passers-by.
6. Odor production and movement. Because odors will be produced by the swine facilities and the lagoon, considerations should be given to prevailing wind direction, and air drainage patterns when winds are calm and humidities are high. Odors remain concentrated and follow flow lines similar to water during periods of high humidity and low air movement.
7. Develop and document a defensible site selection procedure. Given the possibility of future litigation, a defined site selection procedure should be used in selecting a site, and that procedure should be followed and documented. It can then be used as supporting evidence should the location be legally challenged. Successful defense of a legal case against a livestock production facility generally requires that all local, state, and federal regulations are followed.
8. Likelihood of future nearby housing development.

Co-treatment of Domestic Waste

In general, domestic waste cannot be added to livestock lagoons. Some states prohibit this practice. Contact your local Department of Health for more information. Appropriate state regulatory agencies should be contacted if this practice is being considered.

Pretreatment of Manure Entering Lagoons

Reasons for Pretreating

The "health" of an anaerobic lagoon is controlled primarily by the loading rate. As a rule, reducing the organic loading rate reduces the potential for odors. Where consideration is given to increasing herd size and it is impractical to enlarge the lagoon to allow for the increased loading, the organic strength of the manure flowing into the lagoon should be reduced. Settling basins and mechanical separators can achieve solids and volatile solids reductions of 40% to 50% in the liquid entering lagoons. This reduction in organic loading will decrease the potential for odor.

Settling Basins

Settling basins are typically earthen or concrete lined ponds that are designed to promote the settling of the heavier manure particles. These units are frequently only two to six feet deep. The design goal is to reduce the fluid velocity to less than foot per second. Liquid flows from one end of the basin to the other before exiting. It may be beneficial to use a baffle around the discharge pipe to retain floating solids The material in the basin is removed periodically as the solids concentration increases and the retention time decreases.

Make settling basins large enough to have a usable depth of at least 2 ft with another 1 to 2 feet of depth available for sludge storage.

For flush systems: size the basin for a detention of at least 30 minutes. For example, if two 500 gallon flush tanks

dump during each 30 minute period, the usable tank volume should hold at least 1000 gal (137 cu ft). In this case, the tank would have a surface area of 137 cu ft/2 ft = 68 sq ft. A tank configuration of 7 ft x 10 ft or larger would provide this.

For pit recharge and liquid manure pit systems, size the settling basin to hold the manure from the largest pit that will drain into it. For example, a building pit which is 8 ft wide x 100 ft long x 4 ft deep will require a settling basin that has a volume of at least 3200 cu ft, plus an additional foot or two for storage of settled solids.

Settling basins can be designed to simply overflow with solids removed frequently with liquid manure handling equipment If elevation permits, settling basins can be fitted with a removable overflow pipe plug so that liquid can be drained to the lagoon either intermittently or continuously. They also can be designed with a small opening which is always open to allow liquids to slowly drain away from the settled solids. Solids can be removed with a front-end loader. In this case, provide an access ramp with no more than 1:12 slope.

Mechanical Separation

Mechanical separators can be used to process the flushed liquid from swine production facilities. Several types of separators are on the market including stationary sloping screens, continuous belt sloping screens, vibrating screens, centrifuges and auger press screens. As with most mechanical devices, maintenance and management must be considered. Many mechanical separators require daily cleaning and flow adjustment. To achieve optimum performance, the flow to the separator must be reasonably consistent. Frequently the flow from the production facilities is directed into a holding/mixing tank and then pumped to the separator at a regulated flow. It is possible to produce separated solids with a solids content greater than 25%. The separated solids can be directly applied to land, composted for possible commercial markets or used as a cattle feed ingredient For use as a cattle feed ingredient the separated solids should be mixed with a forage material and ensiled.

Anaerobic Lagoon Management

Lagoon Startup

Startup of anaerobic lagoons should be planned so as to minimize biological stress. This will allow the lagoon to produce necessary bacteria, and in doing so to improve its capability to treat manure. Anaerobic bacteria are slow growing. It can take more than a year to increase bacteria populations to desired concentrations. An anaerobic lagoon usually takes over a year to reach maturity. Until it reaches maturity, elevated odor may be detected. This is especially true in colder climates and if the lagoon is loaded too rapidly. There are several factors that a producer should consider when initiating use of an anaerobic lagoon:

1. The volume of the lagoon defined as the minimum design volume should be filled with water before introducing manure. For a multiple stage lagoon with the first stage holding the minimum design volume the entire first stage should be filled.
2. Lagoons should be started in the late spring or summer if at all possible. This allows the bacteria opportunity to become established since they grow and reproduce faster at warmer temperatures.
3. The amount of manure loaded into a lagoon should be gradually increased over two to three months (3-6 months if done in cooler times of the year). This typically can be accommodated easily if the lagoon is placed into operation at the same time that the sows are placed on the site. The manure load will gradually increase as the nursery and finishing units are populated. If a new lagoon is constructed to treat an existing manure flow, the amount of manure added per day should be brought to full load over a period of several months.

Berm/Bank Management

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Lagoon banks and berms must be managed to prevent or minimize erosion and deterioration by establishing grass on lagoon banks and berms. Provisions for mowing grass should be made for berms and the outside slopes of lagoons. This will allow periodic inspection which should be made to ensure that no seepage is occurring. Livestock should not be allowed access to the inside or outside slopes of lagoons. Large weeds, shrubs and trees should not be grown on lagoon banks or berms. Root penetration and subsequent decay could initiate leakage. Aquatic weeds contribute to stagnant water where mosquitoes can breed. Rodent populations should be eliminated from lagoon banks. Burrowing by rodents can lead to lagoon leakage on exposed sides.

Odor Control

During the winter, biological activity in lagoons is reduced and organic matter is incompletely digested. As the lagoon warms in the spring, bacteria are presented with excess organic matter to stabilize. At this time, very vigorous activity is observed on the lagoon surface and large amounts of biogas are produced. This typically is referred to as lagoon "turn-over". During a turnover, highly offensive gases can be produced, the result of incomplete digestion. One means of reducing odor production potential is using lower loading rates, especially during winter months and early spring.

A number of commercial products have been marketed that advertise the ability to either reduce or control odors. These materials include masking agents, chemicals that can temporarily bind ammonia, chemicals that inhibit urease production and, therefore, ammonia production, bacteriocides, chemicals that neutralize odor, chemicals that stimulate bacterial growth and biological preparations that contain special" strains of bacteria. However, most of these products have not been scientifically evaluated and proven to be effective; even so, there are numerous reports from producers attesting to the partial effectiveness of some of these products. Considering all of the materials available, those that contain active bacterial cultures hold the most promise for helping the lagoon's bacteria to limit odor. The producer should be very wary of any unsupported claims by vendors of odor control products. Chemicals that may have positive results in one situation may not be effective in seemingly similar situations.

Periodic Removal of Lagoon Liquid

Lagoons located in all but the most arid of climates will accumulate liquid over time. Most lagoons are designed for a given amount of storage. This storage volume should be sufficient to allow liquid removal to coincide with beneficial nutrient use on crops. Lagoons should not be pumped below the minimum design volume. This ensures that sufficient volume is available for adequate manure treatment and to retain the necessary active bacterial culture. The minimum design volume depth should be noted by the lagoon designer on a design drawing. A grade stake or similar marking device should be positioned in the lagoon so that those responsible for pumping the lagoon will know when to stop pumping. Typically, 40% to 50% of the active lagoon volume should be left in the lagoon.

Remove lagoon liquid in the colder climates only during the warmer summer months. To allow sufficient bacterial populations to develop, large amounts of lagoon liquid (more than 25% of total volume) should not be removed in the late fall. For warm, humid climates, lagoon liquid can be removed throughout the year if an acceptable land application site is available.

If the lagoon system has multiple cells in series (one cell emptying into another) the effluent pumped should not come from the first stage. The intake for the removal pump should be located as far as possible from the inflow line to allow for maximum treatment. Frequently, the pump intake line is placed on a float with the pipe submerged approximately one foot below the liquid level to avoid clogging the pumps and pipe with floating debris.

Fate of N, P and K and Pathogens

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Most of the nitrogen that enters a lagoon is converted to ammonia. The nitrogen in the urine will convert to ammonia rapidly while the nitrogen in the organic matter will transform over many months. A relatively small amount of the total amount of nitrogen added to a lagoon is retained in the sludge, even though the nitrogen concentration in the sludge can be quite high. Much of the ammonia nitrogen will volatilize from the surface of the lagoon over time. The amount of volatilization that occurs increases as air movement above the lagoon surface, pH and lagoon temperature increase. Typically as much as 70% to 80% of the nitrogen converts to ammonia and is volatilized. Lesser amounts of ammonia volatilization will occur in cooler climates.

Much of the phosphorus added to lagoons will attach to particles and accumulate in lagoon sludge. Therefore, phosphorus loss over time is minimal. Most of the potassium remains in solution. In arid climates where there is a net evaporative loss over the year or where recycling of lagoon liquid for flushing is practiced, potassium concentrations can become quite high.

Other than the nutrient loss discussed above the only other major nutrient removal mechanism is land application of lagoon liquid. Due to the wide variation in lagoon designs and climatic conditions, it is extremely difficult to predict nutrient concentrations. The best practice is to always have representative lagoon samples analyzed before pumping lagoon liquid. This information is essential in matching nutrient application with agronomic uptake to avoid excess nutrient applications that could result in water contaminations.

Pathogens can survive anaerobic conditions for extended periods of time. Coliforms, streptococci, Escherichia coli, enterococci, Salmonella species, and Serpulina hyodysenteriae and many other microorganisms have been identified in swine lagoons. Research has even indicated the development and perpetuation of specific strains of pathogens for a given lagoon. However, most pathogens have significant population reductions within 30 days. Table 1 indicates some possible ranges of removal of certain organisms in lagoons. Most microbial populations are less than 10^4 organisms per milliliter. Lower lagoon organic loading rates have been suggested as a means of reducing the potential of pathogen survival.

Table 1. Percentages of populations of microbial species in raw manure remaining ill lagoon liquid.

Organism	% Remaining
Fecal coliform	1 - 10
Total coliform	0.2 - 2
Enterococci	0.001 - 0.05
Fecal Streptococci	0.005 - 15

Recommendations to minimize potential pathogen risks to humans and swine include:

1. Instruct workers to practice proper personal hygiene.
2. Locate recycle intake lines in a lagoon as far from flush manure inflow lines as possible.
3. Prevent swine from making contact with recycled lagoon liquid.
4. Operate lagoons as designed.
5. Design lagoons appropriately.

Concrete Pit Construction: A Commonsense Guide
For Producers and Builders
Feldmann & Associates

Someone once said, "I know of two types of concrete. Concrete that has cracked and concrete that is going to crack".

"Even the best designs will fail if proper construction practices are not followed."

Cracking of concrete can be minimized and controlled when designed and constructed properly.

For sites that have a high degree of sensitivity to ground water contamination due to factors such as pre-existing geological features (sand), additional safety factors should be used....

Cracks can be held tightly together with proper reinforcing. Consequently, reinforced concrete may have some very small cracks but still be relatively impermeable.

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CONCRETE PIT CONSTRUCTION: A COMMONSENSE GUIDE FOR PRODUCERS AND BUILDERS

Terry Feldmann and Mark Armstrong
Feldmann & Associates

Introduction

Due to increased negative publicity of earthen manure constrainments in recent years, more producers are interested in concrete pits. Regulators in Illinois and many other states have established minimum standards for the design and construction of earthen manure constrainments to provide adequate protection to the environment. Producers and builders should also follow minimum standards for pits.

As with any structure, concrete manure pits/tanks are not fool-proof. However, with good quality design and construction, risks can be adequately minimized. Good design and construction also significantly influence pit longevity.

Minimum design and construction standards, whether adopted voluntarily or through regulation, should provide:

1. low risk to the environment and public safety,
2. minimal liability to the producer, and
3. increased public confidence.

Equally important is commonsense in our approach to both design and construction. Good commonsense can go a long way to ensure adequate protection to the environment and economic feasibility. Commonsense and experience dictate a team approach consisting of the producer, builder, and the designer(s) is needed for this design and construction process.

Understanding the Design Process

Typically there are three main phases in the concrete pit/tank design process. The phases are:

1. Preliminary Design Phase
2. Design Development Phase, and
3. Construction Phase.

The builder is not always part of the preliminary design phase but in many cases can be helpful in identifying cost saving items in the Design Development Phase. For example, your builder or contractor can help identify certain materials (e.g., grades & size of rebar or welded wire mesh, subbase materials, etc.) which are most competitive in your area. Additionally, your concrete contractor can identify labor saving items which might be suitable for your facility (e.g., available form sizes, joint/waterstop locations, screeding techniques, etc.). Of course, active and experienced agricultural designers may already know which cost saving items are available and acceptable based on past projects.

Preliminary Design Phase

One of the first parts of the preliminary phase is to estimate the required size of the pit or tank. The length and width may already be determined in some cases as with a building over a pit. In this case the volume required determines the depth. In other cases, such as an outside concrete storage (above or below ground), the feasible depth will influence the diameter or length and width. Whether to build a square, rectangular, or round outside storage pit depends on several factors such as cost, potential odor control covers, etc. If considering a poured in-place, outside storage, round tanks (especially larger ones) are definitely less expensive than square or rectangular.

Required storage volume is influenced by many factors such as the length of storage required, manure production rate, waste water, net precipitation into the containment, freeboard, bedding or any other component which must be stored. Data for manure production and sizing procedures can be found in the following publications:

1. ASAE D384.1, 1993, Manure production and characteristics,
2. ASAE EP393.2, 1996, Manure storages,
3. MWPS-18, 1993, Livestock Waste Facilities Handbook, and
4. NRCS. 1992, 210-Agricultural Waste Management Field Handbook.

We must also realize that, even with the best agitation and pumping equipment, not all of the manure will be removed. ASAE (1996) Engineering Practice EP393.2 says that we should allow for a minimum of 8" at the bottom to allow for materials not removed during pump-down unless a sump is provided. NRCS (1995) Code 313 and NRCS (1992) Code 313-IL both require a minimum of 6" for residuals.

Sumps are generally a good idea and enable removal of additional manure depending on the type. However, pits for sand laden manure from dairy freestall facilities and other manure with high solids and viscosity do not benefit from sumps. Sumps should be sized to accommodate today's pumps which are usually 3'-4' square and 8"-12" deep. Provide a pit access at least every 60'-100' o.c. and on alternate sides. Access size must also accommodate larger pumps. A minimum of 5' x 5' I.D. is recommended. Pit fan access and attachment must also be addressed when planned. Fans must have a large enough opening to the pit but not reduce the capacity beyond what is needed.

One of the most important parts of the design process is collecting data about the site. Commonly called site investigations, information on is collected on the soils, location of well(s), water table, site slope, drainage courses, distances from neighbors, and other information as required for various permits. In Illinois there are several permits or permit-like requirements depending on your particular site. These include but are not limited to a:

1. Notice of Intent to Construct filed to the Illinois Department of Agriculture,
2. Endangered Species Consultation to the Illinois Department of Natural Resources,
3. General Permit to Discharge Storm Water from Construction Site Activities (sites disturbing >5 acres) to the Illinois EPA, and
4. Archaeological or Cultural resources survey to the Illinois Historic Preservation Agency.

Larger sites should also have an on-site topographic survey so that the designer can accurately balance the cut and fill. Typically, sites around 5 acres and larger more than pay for the surveying and engineering costs with savings on excavation. The survey can also be used to document the site slope, distance to property lines, wells, roads and neighbors, drainage courses, etc.

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The soils investigation is the most important part of the preliminary design phase, yet one of most neglected by much of the industry. The main data collected through the soils investigation is the depth to seasonal high water table, depth to bedrock, soil types, and bearing strength. Soils investigations are commonly performed with a probe truck or drill rig, or a back hoe. A minimum of two borings should be performed at each site. Additional borings should be performed at the discretion of the designer depending on the size of the site and geologic features. If the soils of the first two borings are nearly identical, additional borings may not be warranted.

Some of the information needed for footings and wall design can be obtained by taking soil samples back to a soils lab. There are many geotechnical engineering firms with soils labs in Illinois. Shelby tubes (thin metal tubes typically 2.5" dia. x 2.5' tall) are a common tool for obtaining intact samples. The tubes can be pounded into the soil with a drill rig or pushed into the ground with a back hoe. In the lab, the soils can be tested to determine the bearing strength, the soil load on the walls, etc. In many cases, detailed soils testing can prevent over-design of pit walls and footings. An alternative is to simply classify the soil type and use more conservative "table values" as found in ASAE EP393.2 (1996) or NRCS (1995).

Design Development Phase

One of the first parts of the design development process is to determine the loads on the pit. Loads are created by soil, manure, slats, animals, buildings, snow, wind, heavy equipment operating near tank walls, etc. Some loads are considered "dead loads" (permanent) such as concrete and other building materials. Other loads are "live loads" such as animals, snow, wind, soil, etc. ASAE EP378.3 (1996) presents probable loads due to use for species of animals, manure, etc. and methods of applying the loads in the design process.

Structural designers use safety factors to minimize risk of failures. ACI-318 (1995), Building Code Requirements for Reinforced concrete, requires a safety factor of 1.4 for dead loads, 1.7 for live loads, and other safety factors. ACI-350R (1989) Environmental Engineering Concrete Structures requires increased safety factors.

To provide reasonable protection to the environment, designers of concrete manure pits/tanks should follow ACI-318 (1995). For sites that have a high degree of sensitivity to ground water contamination due to factors such as pre-existing geologic features, shallow aquifers, etc., additional safety factors should be used at the discretion of the designer. A designer might simply use a more stringent requirement for crack control (e.g., Z-check &lt115 or 95 instead of 145 kips/in) or incorporation of other factors as outlined in ACI-350R (1989).

Someone once said, "I know of two types of concrete. Concrete that has cracked and concrete that is going to crack". While this is probably an accurate statement, it does not give most of us the real picture. In other words, cracking of concrete can be minimized and controlled when designed and constructed properly. Cracks can be held tightly together with proper reinforcing. Consequently, reinforced concrete may have some very small cracks but still be relatively impermeable.

First ask the question "why do we use so much concrete?" Answer: concrete is a very strong, impermeable building material which is relatively economical. Concrete is very strong in compression but not in tension. Steel is strong in tension which is why we use it to reinforce concrete. After the concrete cures, the steel holds it together and resists the tensile loads from bending, shear, and expansion and contraction due to shrinkage and temperature change.

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There are different grades of rebar commonly used. Grade 40 and no grade have a typical tensile strength of 40,000 psi. Grade 60 rebar and welded wire mesh have a tensile strength of 60,000 psi. Since Grade 60 is stronger, you can generally space it further apart. The increased material cost is offset by reduced labor costs from handling fewer pieces.

The most complicated part of pit design is the walls. First, you must consider the type of wall. Below grade pit walls are designed for both inward (soil & hydrostatic) and outward (manure) pressures. Many walls are laterally supported (inward and outward) at the top with slats, beams, lids, etc. In this case vertical rebar is sized to resist the bending and flexure of the wall between the top and bottom supports. Walls not supported at the top must be designed as a cantilever (with large footings) or with hoop tension steel in the case of round tanks.

The Portland Cement Association (1993) presents design procedures for circular concrete tanks. There has been considerable discussion about whether to consider the connection at the bottom of the wall a pinned (hinged) connection at the base, a free sliding base, or a fixed connection at the base. Jofriet (1996) presents the case that in reality it is none of the above but somewhere between a pinned and free sliding base. Their analogy is that the base connection acts more like a heavy spring. The paper presents a finite element analysis determining required hoop tension steel for different ratios of height to diameter. On the other hand, MWPS-TR-9 (1998) uses a hinged base assumption for tank designs from 30' to 120' dia. for 8' to 14' high walls.

Reinforcing for floor slabs should be based on the subgrade drag theory found in ACI-360 (1992) Design of Slabs on Grade (MWPS 1998, NRCS 1995). At a minimum, provide temperature and shrinkage steel (area of steel = 0.18% of the cross-section of the slab for Grade 60 steel). ACI-318 (1995) requires a steel spacing of no more than 18" o.c. or three times the thickness (applies to walls also). For sensitive sites ACI-350R (1989) suggests a maximum steel spacing of 12" o.c. Although many contractors would rather use a grid of #3 or #4 rebar, rigid welded wire sheets are probably more economical for floors and provide better crack control because of the smaller grid spacing.

Bases and subbases can have a significant effect on the amount of steel required in pit floors because the coefficient of friction value varies with type of base. For example, slabs poured on sand or polyethylene sheeting have a coefficient of friction of about 0.9 and 0.8, respectively, compared to soil or asphalt which has a value of 2 or more (ACI 1997). For pit floors where relatively long distances between joints is desired (joints are usually expensive since use of water stops require a significant amount of labor and planning) use of a 2"-4" compacted sand subbase reduces the steel requirement to a reasonable amount (half the amount for soil). A sand subbase also helps better drain seasonal high water tables to the perimeter tile system.

Many people ask "Can't fiber-reinforced concrete be used instead of the floor steel?" (sometimes this is more of a statement). The answer is no. Fibers help to minimize hairline cracks that develop as concrete cures. Fibers do not prevent the development of larger shrinkage cracks. After concrete cures, fibers provide no reinforcement. A more appropriate use of fibers would be surfaces used for feeding and watering animals where the reduction of hairline cracks is more critical due to the more corrosive and abrasive exposure.

Use high quality, air-entrained concrete for durability, low permeability, and resistance to corrosion from manure. Floors and footings should have a 28-day compressive strength of 3000 psi while walls should have a strength of 4000 psi.

Use the stiffest feasible (ie., low slump) mix for optimum water-tightness, durability, and strength. A

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slump of less than 4" is desirable to minimize shrinkage cracks which develop during curing. Note that a slump of 5" may be needed for pumping and workability. Plasticizers may be used to temporarily improve workability. Since they are time dependent (e.g., some less than 5 minutes), plasticizers must usually be added on site. Additional ways to minimize shrinkage cracking is to use a high coarse aggregate to sand ratio, minimize water requirements in the mix, and avoid high temperatures in freshly mixed concrete. Five essentials of quality concrete (Harless, 1998) are:

1. proper selection of materials (e.g., cement, admixtures, aggregate, water, etc.);
2. correct proportioning, mixing, and transportation;
3. careful placement & consolidation;
4. skillful finishing with proper finish for application; and
5. proper curing.

There are many types of admixtures. Admixtures can be used for many purposes such as: air entrainment, increasing workability of low slump-low water mixes, retarding or accelerating curing, decreasing permeability, chemical resistance, corrosion protection, etc. Calcium chloride is not recommended as an accelerating agent because of the potential for increased corrosion of reinforcing with soils or pits containing sulfate compounds. Other non-chloride containing admixtures are available to aid with curing during cold weather.

Footings must be wide enough to spread the load over a large enough area so that the soil bearing strength is not exceeded. Most clay type soils have a bearing strength of 2000 psf but some may only support 1000 psf. Footings below the columns or pillars (which support beams/lintels) are often overlooked and undersized causing cracks in the floor. Wider footings must also be thicker to transfer the load. Footings should extend to or below the extreme frost penetration to prevent damage from heaving.

Perimeter tile drainage and granular backfill should be used wherever the seasonal high water table may rise to the bottom of the containment. Pit floors are rarely designed to resist the hydrostatic pressure of water rising above the floor. Soil bearing strength is greatly reduced when soils become saturated. Perimeter tiles can also greatly reduce rebar requirements in walls because of reduced soil pressures. Tile should be located below the bottom of the outside of the footing. Tiles should drain to a free outlet or to a lift station when needed. Provide a minimum of one inspection port in the tile for each pit/tank.

Rebar cover should be at least 3" in footings and 2" in walls and slabs. ACI (1995) allows 1.5" but 2" should be used in pits because of the corrosive environment. Reinforcing in slabs should be centered or just above the center but never below the center of the slab.

Joints should be planned ahead of time. Where possible, use only vertical joints in walls. All joints and pipe penetrations should be made watertight by use of waterstops and/or a sealant.

Construction Phase

Even the best designs will fail if proper construction practices are not followed. One of the most important decisions that must be made prior to construction is establishing a plan to ensure good quality assurance/quality control (QA/QC). Usually most plans split the responsibilities between the producer and the contractor. Either or both might use a materials testing lab and engineer. It is a good idea to take pictures of the progress if only to document good workmanship. Field log books should contain records of tests performed, weather conditions, precautions taken, and checklists reviewed. Always make a set of as-built plans before it is too late to easily obtain this information.

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The most common tests in QA/QC plans are slump tests, compression testing of randomly sampled cylinders, and air content. Do not add water to concrete at the site. Adding just one gallon of water to a yard of concrete will increase slump about 1", reduce compressive strength 200 to 300 psi, and increase shrinkage cracking potential about 10% (The Aberdeen Group, 1994). Do not allow concrete to drop more than 5'. Concrete should be placed no more than 90 minutes after batching. In order to prevent cold joints each lift must be consolidated into the previous one and not more than 45 minutes after the previous lift was placed.

Rebar should be free of loose, flaky rust, mill scale, concrete, oil, grease, paints, or other deleterious substances. No welding is allowed. Do not heat rebar for bending. All rebar must be properly bent (e.g., 3" radius for #4 bars). Follow requirements for splices. Do not splice rebar at corners.

Concrete must be allowed to properly cure. Cover concrete for at least 5 days or keep moist when temperatures exceed 80 F. Do not place concrete on frozen ground. Unless cold weather concreting measures are provided, do not place concrete when the mean daily temperature drops below 40 F for three consecutive days. For cold weather concreting a warm mix should be used (55 F to 70 F). Concrete should also be covered to capture the heat of hydration (curing).

Site preparation and excavation should be performed to predetermined elevations. All topsoil and organic materials must be stripped and should be used later for back fill grading. Any fill should be of suitable material for compaction. Fill should be compacted to a minimum 95% of standard proctor density at a moisture content of +/-2% of optimum. Sand subbases should be compacted to a minimum of 98% of standard proctor +/-3% of optimum. Grade subbase to +/- 1/2".

Final grading should slope away from the tank at a minimum 5% slope but not steeper than can be mowed or maintained without erosion (e.g., 4:1 max.). Do not operate heavy equipment within 5' of walls unless the extra surcharge is provided in the design. For most sites use of a granular backfill at least 3' above the footing around the perimeter of the tank minimizes pressures on the wall and increases stability. Do not backfill or operate heavy equipment around pits/tanks until concrete has adequately cured (3000 psi) or before slats are set (if planned). Backfill around tanks should not vary more than 2'-3'.

All piping into or out of pits should be properly sealed and installed. Cleanouts, for example, must extend to an elevation high enough to prevent a discharge incase of a blockage. Any loading or transfer pipes should extend over the top of the pit/tank wall and/or be double valved.

Keep safety in mind and train personnel. Fence below ground pits and post warning signs per ASAE EP470 (1996).

Operation & Maintenance

Visually inspect exposed concrete for signs of excess cracking or manure seepage which need to be repaired. Monitor the frequency of manure removal and note any fluctuations (increase or decrease) in the time between removal events. Maintain fences and signs to prevent accidents. Control the liquid level so that the maximum operating level is not exceeded. Regularly inspect and maintain the perimeter tile drain system. Add water to the pit after forms are removed to reduce shrinkage cracking and temperature effects.

Conclusion

Concrete pits can store manure in an environmentally safe manner. Sound design procedures and standards should be followed to provide adequate protection to the environment based on the sensitivity of a site. Good planning and design is essential to provide long term performance. Communication between the producer, builder, and designer provides an optimum design for a particular site.

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NMP

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

I feel due to the shallowness of the water table and the sandy soil, I would like there to be a very strict plan to address the process if there should be a liquid manure spill or leak and what will be done

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

NMP

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

- Since the digester is not planned until Phase II, will there be open manure lagoons until then? When will the digester be operational? Is there any danger to citizens from those lagoons overflowing, containment leakage or causing health problems (asthma, etc.)

- What type of lining (if any) will be used for the disposal of diseased animals (catastrophic mortality pits) and/or any pit where diseased animals may be buried?

- If a deceased animal has Bovine Spongiform Encepalopathy / mad cow disease and is buried in an unlined / uncontained pit, is there any possibility that the disease can be transmitted into the soil or groundwater?

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

FACILITY DESIGN

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Vermin infestations, i.e., house flies, stable flies, mosquitoes, rats

Also inhumane treatment of animals – crowding, confinement, tiny cages for veal calves

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WATER RES.

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Is the DNR looking @ the economic impact that this would have on rec. (RECREATIONAL ECONOMIC IMPACTS)

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact I[redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

Recreation

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

I have a concern with the fact that Saratoga is a highly recreational area and the Proposed Dairy will significantly impact the economy + lifestyle of its residents + its visitors.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarificatio[redacted]

Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

Quality of life

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

My biggest ~~con~~ concern is not what is specifically at your tables. It is "Quality of Life". Many people moved to Saratoga because of the outdoors. They bought acres surrounded by "paper land" that is used for hunting, walking, fishing — recreation. We love the outdoors. The land behind me gets bulldozed and my quality of life has gone down. Our family walks and rides horses back there weekly. We sit outside and look around a campfire a couple times a week. There are many families in the same boat. Regardless of air, water and many concerns — Our quality of life goes way down the day they cut the first tree.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

Wildlife / Fisheries

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

I am concerned about the effect of hunting and fishing opportunies in South Wood county and corresponding loss of license sales for the DNR

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

PUBLIC LAND/REC.

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Please look at the "recreational" aspect of this project. We have a number of tourist coming to the area that have built up our towns, with this land gone to farming you are allowing our towns to become stagnant

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

[redacted]
Wisconsin Rapids, WI 54494

Dan Baumann
Wisconsin DNR
August 23, 2012

Dear Mr. Baumann,

We live about one mile from the proposed Golden Sands Dairy. Wysocki plans to use the fields across the road from our house and also the land next to our driveway. We are concerned about the discharge of manure, both solid and sprayed manure, around our home and its potential to contaminate our groundwater – our irreplaceable groundwater - and to injure our health with the airborne bacteria it contains!

I wonder if you are aware that nearly all the homes in Saratoga sit at various distances from the road. This isn't like most urban areas where there are sidewalks and houses just beyond them. Some homes are built close to the road and others, like ours, sit several hundred feet back. Some are built more than ten acres from the road!

The enclosed article: *CAFO Applications When Ground is Frozen, Snow-Covered or Saturated* states there is a 500-foot setback from "inhabited dwellings" in winter. However, five hundred feet from our house might only be 50 feet from our neighbor's door because he is closer to the road! The end of the irrigation line will make the same circle but the 'distance to a habitable dwelling' will be different for each home. How will the DNR determine the setbacks in each case?

We have found DNR setback information dated February 2012. It, too, says 500-feet. Does this mean that Wysocki will not be able to spread manure to the edge of my driveway? What about the fields across the road? Can manure be spread to the road edge since our houses are on the opposite side of the road from the field? He will have so much manure and will need to put it anywhere he can! Would it be possible for the DNR to make a setback measured from the middle of the road or, in the case of our driveway, measured from our lot line? It will not work to use "distance to habitable dwelling" in Saratoga's case. We are a Town, each home is different, and this is not farmland!

After reading the Memo listed in the index, we cannot see how permits for this dairy and the planned manure spreading on land located in and around our homes is justifiable. How can the DNR allow Wysocki to do this to people – not just here in Saratoga but to anyone in the State? The DNR's mandate is to protect Wisconsin's land and its people. This manure spreading – according to the Wisconsin Division of Public Health - is a real threat to our water supply, to us, and to our future - especially the future of our children and the folks ill with compromised immune systems!

We truly cannot see how the DNR can give Wysocki permits to build a dairy here in Saratoga! Please don't just hang the citizens of Saratoga out to dry. We are being asked to give up our quality of life and maybe our health. The DNR – whose job it is to protect us – has the power to refuse permits to this dairy. If the greedy people come first, the least the DNR – who should protect the land and the people - can do is to provide as many safeguards on this project as possible. It is so sad when greed comes first!

Thank you for any way you can help us.

[redacted]
Protect Saratoga

Highlighted and Summarized Articles On
Setbacks and Liquid Manure Spreading
Submitted by [redacted]
Protect Wood County

Letter of Requests to DNR at August 23, 2012 Meeting Re: Golden Sands Dairy

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Wisconsin DNR

CAFO Requirements for Spray Irrigation of Manure or Process Wastewater
Based on WPDES Rock County CAFO
February 2012

"CAFO permitted farms that use spray irrigation systems to apply manure or process wastewater are required to meet additional land spreading and other legal requirements."

"The requirements of x. NR 243.14 land spreading requirements, permanent spray irrigation must meet the minimum land spreading and legal requirements listed below."

Chapter	Requirements – Permanent Spray Irrigation Systems
NR 214.14	Criteria for site location (includes 500' or greater setback from inhabited homes, and larger setback distances from wells, groundwater and bedrock than specified in NR 243.14), design and construction, discharge limitations, discharge monitoring requirements, operating requirements."

"Mobile spray irrigation systems must meet the land spreading requirement of x. NR 214.14, which requires 500 foot or greater setback from inhabited dwellings."

"The purpose off NR 1 214 requirements for spray irrigation systems is to protect surface and groundwater quality and public health."

"The DHS memorandum concludes <u>that reducing or eliminating human exposure to manure or process wastewater</u>, with its corresponding risk of infection by bacterial, viral and parasitic pathogens, <u>is a foundation of public health practice</u>."

CAFO requirements for Spray Irrigation of Manure or Process Wastewater

February 2012

Based upon a recent WPDES permit proposal from CAFO farm in Rock County, the issue of spray irrigation of manure and process wastewater has come to the department's attention. CAFO permitted farms that use spray irrigation* systems to apply manure or process wastewater are required to meet additional land spreading and other legal requirements (described below). These requirements may require amendment of a CAFO Engineering Plans and Specifications and Nutrient Management Plan.

** Spray irrigation means: the application of liquid manure or process waste water to cropland using equipment that discharges manure into the air via a single nozzle or multiple nozzles or hoses and which disperse the manure or process wastewater over distances greater than could be achieved using typical moving vehicle or manure hauling equipment.*

In general, there are two types of spray irrigation systems: permanent and mobile.

'Permanent' spray irrigation systems use permanent structures/equipment to apply manure or process wastewater to fields. For example: fixed underground pipelines with risers and fixed or dedicated center pivot sprinklers that stay on field year around.

'Mobile' spray irrigation systems do not use permanent structures or equipment to apply manure or process water to fields. For example: temporary lines or flexible hoses and mobile sprinkler or spray devices that move from field to field for applications.

In addition to the requirements of s. NR 243.14 land spreading requirements, permanent spray irrigation must meet the minimum land spreading and legal requirements listed below. Please be advised that your Nutrient Management Plan and Engineering Plans and Specifications may not meet these requirements and amendments may be necessary for compliance. Check your plan to verify this.

Chapter	Requirements - Permanent Spray Irrigation Systems
NR 243.15(6)	All permanent spray irrigation and other land treatment systems shall, at a minimum, meet requirements of NR 214.14, 20 and 21 and land application requirements specified in NR 243.14; submittal of plans and specifications to DNR for review and approval necessary
NR 214.14	Criteria for site location (includes 500' or greater setback from inhabited homes, and larger setback distances from wells, groundwater and bedrock than specified in NR 243.14), design and construction, discharge limitations, discharge monitoring requirements, operating requirements
NR 214.20	Soil Investigation requirements - plans and specifications
NR 214.21	Groundwater Monitoring requirements ** - plans and specifications
NRCS 634	Transfer system (pipes, pipelines, reception tanks, etc.) requirements – plans and specifications

** = Groundwater Monitoring Requirements may be waived by the Department – see NR 214.21(1)(d).

In addition to the requirements of s. NR 243.14 land spreading requirements, mobile spray irrigation systems must meet the land spreading requirement of s. NR 214.14, which requires 500 foot or greater setback from inhabited dwellings. Please be advised that your Nutrient Management Plan may not currently meet this requirement and amendments may be necessary. Check your plan to verify this.

Mobile spray irrigation systems have fewer ch. NR 214 requirements than permanent spray irrigation systems for the following reasons:

- Mobile systems, in general, are used less frequently (e.g., 1-2 times per year in spring and fall) than permanent systems (e.g., 4-6 times per year during growing season) to apply manure or process wastewater to fields to meet crop nutrient needs.

- Mobile systems are used in a manner that is consistent with typical manure applications methods commonly used in Wisconsin (e.g., injection, surface application via tankers).
- Section NR 243.14 land application requirements are adequate to address surface and ground water quality risks associated with most mobile spray irrigation systems.

The purpose of the NR 214 requirements for spray irrigation systems is to protect surface and groundwater quality and public health. To clarify possible public health impacts associated with spray irrigation systems used to apply manure and process wastewater, the Department requested assistance from the State Department of Health Services (DHS) for a proposed CAFO in the SE part of the state. We asked DHS to determine if ch. NR 214 minimum required setbacks from inhabited dwellings were sufficient from a public health perspective with respect to the proposed project.

In response, the DHS produced a written memorandum (attached). The DHS memorandum addresses the public health question of human exposure to manure spray irrigation drift from a proposed permanent center pivot spray irrigation system in the SE portion of our state, the risks corresponding to human exposure, and what exposure factors impact the health risk. The DHS memorandum concludes that reducing or eliminating human exposure to manure or process wastewater, with its corresponding risk of infection by bacterial, viral and parasitic pathogens, is a foundation of public health practice and then provides four recommendations to protect public health.

The DHS memorandum is a resource we may want to use when determining what applicable requirements apply to CAFO permitted farms that use permanent or mobile spray irrigation systems to apply manure or process wastewater to fields.

Attachment: DHS memo, dated February 17, 2011

DHS Memo: Attached to Article
CAFO Requirements for Spray Irrigation
Of Manure or Process Wastewater
February 2012

This is an interesting memo and should probably be read completely.

"Robert Dungan with the USDA has provided a detailed review of the fate and trasport of manure bioaerosols, including associated with manure spray irrigation."

"Dungan, in his 2010 review, notes that land application of untreated liquid manures increase the chances of aerosolizing microorganisms."

"Infective inhaled exposure, depending on the organism, could be directly to the lungs, or could be to the gut where inhaled pathogens are secondarily swallowed."

"Given adult inhalation rates of 25,000 L air/d, the presence of bioaerosols implies a risk of significant inhalation exposure."

Airborne pathogens are deposited on ready-to-eat crops or on surfaces handled by adults or young children...the risk of infection would be dependant on the concentration of viable pathogens on the food or handled surface.

"DHS recommends that the land application of manure liquids be managed to minimize impacts, particularly nuisance odor, that might inhibit the full use and enjoyment of neighboring private residences".

"DHS recommends that the permit include regulatory means such as monitoring of both applied liquid manure and deposition in downwind areas, to assure that any permit conditions to avoid aerosolization, drift, odor control are met."

STATE OF WISCONSIN
Department of Health Services
Division of Public Health
Bureau of Environmental and Occupational Health

Memo

To: Ken Johnson, Regional Water Leader, WDNR SCR

From: Robert Thiboldeaux, PhD, Toxicologist, Wisconsin Division of Public Health

CC: Lloyd Eagan, Director, WDNR SCR

Mark Cain, Wastewater Engineer WDNR SCR

Andrew Craig, WDNR Bureau of Watershed Management

Date: February 17, 2011

Re: Public Health setbacks for manure spray irrigation

As part of the Environmental Assessment and permit review for the proposed Rock Prairie Dairy, you have asked the Bureau of Environmental and Occupational Health whether the proposed setbacks for the manure spray irrigation system are sufficient from a public health perspective. Wisconsin code allows for a 500 foot setback to inhabited dwellings unless aesthetic and public health impacts demand otherwise.[1] As the practical experience among state regulatory agencies with manure spray irrigation is limited, we have reviewed current literature and consulted with experts in other states.

The Rock Prairie Dairy proposes land application of liquid manure using center pivot sprinkler technology on quarter section areas. The sprinkler application areas are circular; injection has been proposed for the squared corners of each quarter section. The relevant public health question hinges on determining whether populations will be directly exposed to manure spray irrigation drift, and the risk corresponding to that exposure. Risk is dependent upon:

- The presence of harmful organisms in applied material, *i.e.* bacterial, viral, and parasitic fecal pathogens in untreated liquid manure.
- The presence and emission, to air, of Hazardous Air Pollutants from spray-applied material. Hydrogen sulfide and ammonia are the most commonly identified CAFO-related HAPs.
- Concentration of the applied material, *i.e.* dilution and fecal pathogen load.
- Exposure: drift radius, distance to source, and frequency of exposure.

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[1] Wisc. Admin. Code ch NR 214. LAND TREATMENT OF INDUSTRIAL LIQUID WASTES, BY–PRODUCT SOLIDS AND SLUDGES. http://legis.wisconsin.gov/rsb/code/nr/nr214.pdf

If center pivot irrigation is approved for the Rock Prairie Dairy, then engineering detail and best management practices should be followed to minimize risk to the public. Robert Dungan with the USDA has provided a detailed review of the fate and transport of manure bioaerosols, including those associated with manure spray irrigation.[2] Dungan, in his 2010 review, notes that while land application of untreated liquid manures increase the chances of aerosolizing microorganisms, few papers outside of municipal wastewater research have addressed the risk to humans associated with land application of fecal wastes. Mechanical similarities of manure spray irrigation to other types of waster land application are used in this assessment, and could be used to inform CAFO policy and permitting decisions.

The Idaho Department of Environmental Quality has published a *Microbial Risk Assessment and Fate and Transport Modeling of Aerosolized Microorganisms at Wastewater Land Application.*[3] The Idaho DEQ risk assessment makes the following conclusions:

- Fine droplets may contribute to microbial risk under high wind conditions.
- Droplets larger than 200 micrometers do not transport significantly beyond the application area and may be neglected when analyzing risk at typical buffer zone distances.
- Deposition of droplets and aerosol containing microbial pathogens on surfaces such as produce may be a significant pathway for exposure under windy conditions. Thus, if wastewater loadings are elevated, high-wind cut-off restrictions should be considered.
- Worst-case conditions that lead to the greatest exposure and risk of infection are nighttime low-wind stable conditions, which maximize the inhalation pathway, and high-wind conditions, which maximize the deposition and produce ingestion pathway.

Exposure to airborne or deposited pathogens. With regard to deposition of aerosols, the infective dosages of common fecal pathogens are normally thought of in terms of ingestion rather that inhalation. This makes accurate risk assessment via inhalation difficult even when the airborne concentration is known. Infective inhaled exposure, depending on the organism, could be directly to the lungs, or could be to the gut where inhaled pathogens are secondarily swallowed. Given adult inhalation rates of 25,000 L air/d,[4] the presence of bioaerosols implies a risk of significant inhalation exposure. Similarly, where airborne pathogens are deposited on ready-to-eat crops or on surfaces handled by adults or young children, accumulation could occur throughout the irrigation period, and risk of infection would be dependent upon the

[2] Dungan R. S. 2010. BOARD-INVITED REVIEW: Fate and transport of bioaerosols associated with livestock operations and manures. J. Anim Sci. 88:3693-3706.
[3] Hardy R, Schilling K, Fromm J, Dai X, Cook M. 2006. Technical Background Document: Microbial Risk Assessment and Fate and Transport Modeling of Aerosolized Microorganisms at Wastewater Land Application Facilities in Idaho. Idaho Department of Environmental Quality.
[4] Derelanko MJ, Hollinger MA (eds.). 2002. Handbook of Toxicology, 2nd ed. CRC Press.

concentration of viable pathogen on the food or handled surface. In the case of *E. coli* O157:H7, the infectious dose has been estimated to range from 1 to 100 colony-forming units.[5] For *Salmonella spp.*, an infective dose may be as low as 15-20 cells.[6]

The U.S. Centers for Disease Control has developed worker safety guidelines applicable to the range of land-applied municipal, industrial, and agricultural wastes.[7] In addition to waste worker hygiene practices, training, and equipment that minimize occupational safety risks, the CDC guidance recommends several *Environmental Practices to Prevent and Minimize Occupational Exposures.* These recommendations would apply equally to avoiding exposure to the public adjacent to a manure spray irrigation site:

- Where feasible, substitute Class A biosolids for Class B biosolids.[8]
- Monitor the source material to assure Class A or Class B standards prior to land application operations.
- Monitor stored biosolids prior to application to assure that the biosolids are properly stabilized and that unacceptable regrowth or cross-contamination from substandard material has not occurred.
- Where local conditions permit, inject or incorporate biosolids below the soil.
- On windy days, avoid spreading or disturbing dry biosolids that would create dust.
- On windy days, avoid spreading biosolids by high-pressure spray.
- Avoid unnecessary mechanical disturbance and contact with land-applied Class B biosolids during the period when public access is restricted.
- Equip heavy equipment used at storage and application facilities with sealed, positive-pressure, air-conditioned cabs that contain filtered air-recirculation units.
- Monitor worker exposures when adjusting precautions to address site-specific issues.

Division of Public Health conclusions and recommendations. Interrupting human exposure to feces, with its attendant risk of infection by bacterial, viral, and parasitic pathogens, is at the foundation of public health practice.

- Based on available literature, it appears that a 500 foot setback from irrigation nozzles to receptors for the land application of liquid manure will be adequate to avoid infection *if* the system is designed to (1) substantially

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[5] Paton, J.C. and Paton, A.W. 1998. Pathogenesis and diagnosis of shiga toxin-producing *Escherichia coli* infections. Clin. Microbiol. Reviews. 11(3):450-479.

[6] FDA. 2009. Foodborne Pathogenic Microorganisms and Natural Toxins Handbook. U.S. Food and Drug Administration. http://www.fda.gov/Food/FoodSafety/default.htm

[7] DEPARTMENT OF HEALTH AND HUMAN SERVICES. 2002. Guidance for Controlling Potential Risks to Workers Exposed to Class B Biosolids Centers for Disease Control and Prevention. National Institute for Occupational Safety and Health. Publication 2002.149

[8] See Wisc. Admin. Code ch NR 204.07. DOMESTIC SEWAGE SLUDGE MANAGEMENT http://legis.wisconsin.gov/rsb/code/nr/nr204.pdf

reduce the microbial load of the applied material,[9] using some form of treatment such as aerobic or anaerobic digestion, lime treatment, or composting; (2) deliver spray droplets greater that 200 μm mean diameter to minimize aerosolization and drift, and (3) that the irrigation schedule be optimally managed with regard to weather conditions and time of day. DHS recognizes that manure treatment may be outside of the scope of the current Rock Prairie Dairy proposal.

- In addition to steps to avoid infectious exposure to off-site receptors, land application of manure liquid must be managed to avoid unacceptable off-site levels of hazardous air pollutants, particularly hydrogen sulfide and ammonia. Since manure injection techniques are currently proposed for part of the project, it is noteworthy that injection techniques are among the most effective for the control of both odor and HAP emissions.[10]

- NR 214 allows for the regulation of land-applied wastes with regard to aesthetic impacts. If manure spray irrigation is permitted as part of the Rock Prairie Dairy project, DHS recommends that the land application of manure liquids be managed to minimize impacts, particularly nuisance odor, that might inhibit the full use and enjoyment of neighboring private residences. Nuisances, though qualitative, are important to those perceiving the nuisance, and raise the potential for land-use conflicts. Attention to both technical detail (treatment and storage of manure; application techniques)[11] and landowner relationships in avoiding nuisance conflicts will benefit the Rock Prairie Dairy project.

- If the center pivot sprinkler technology is approved for the Rock Prairie Dairy project, DHS recommends that the permit include regulatory means, such as the monitoring of both applied liquid manure and deposition in downwind areas, to *assure* that any permit conditions to avoid aerosolization, drift, and odor control are met.

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[9] Hardy *et al.* (referenced above) conclude that *E. coli* loadings less than 1000 to 10,000 colony-forming units/L in land-applied wastewater represent minimal risk beyond a typical 300 foot buffer zone.

[10] Burton, CH. 1997. Manure management - treatment strategies for sustainable agriculture. Silsoe Research Institute, Silsoe, Bedford, UK. *In* Casey KD, Bicudo JR, Schmidt DR, Singh A, Gay SW, Gates RS, Jacobson LD, Hoff SJ. 2006. Air quality and emissions from livestock and poultry production/waste management systems. Pp. 1–40. In J. M. Rice, D. F. Caldwell, and F. J. Humenik (eds). Animal Agriculture and the Environment. National Center for Manure and Animal Waste Management White Papers. ASABE, St. Joseph, Michigan.

[11] Kranz WL, Koelsch RK, Shapiro CA. 2007. Application of Liquid Animal Manures Using Center Pivot Irrigation Systems. Univ. Nebraska Extension. Publication EC778.

Airborne Bacteria in CAFOs:
Transfer of Resistance from Animals to Humans
Environmental Health Perspectives

"According to the John's Hopkins team, inhalation of airborne bacteria could constiute another exposure pathway.:

"Bacterial species found in CAFO air samples can cause human disease."

"Viridans group streptococci, normally found in the respiratory tract, are linked to life-threatening infections in immune-compromised individuals." (I have 3 neighbors, 2 with cancer and one with no spleen. Their immune systems are unable to fight off infections.)

"The researchers conclude that exposure to airborne bacteria from a CAFO presents a potential pathway for transferring antibiotic-resistant bacteria from animals to humans".

"CAFO workers.....as well as neighbors near the operation and areas of land where animal wastes are applied, may be especially at risk."

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Performing your original search, ***danger of inhaling pathogens from cafos***, in PMC will retrieve 0 records.

Environ Health Perspect. 2005 February; 113(2): A116–A117. PMCID: PMC1277892
Environews
Science Selections

Airborne Bacteria in CAFOs: Transfer of Resistance from Animals to Humans

Julia R. Barrett

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See "Airborne Multidrug-Resistant Bacteria Isolated from a Concentrated Swine Feeding Operation" on page 137.

Antibiotics are used in concentrated animal feeding operations (CAFOs) to treat and prevent livestock disease and to bolster animal growth and the nourishment efficiency of feed. These nontherapeutic uses involve long-term, low-level dosing that creates an appropriate environment for bacteria to develop antibiotic resistance. Several antibiotics used in animal agriculture are the same as or similar to those used in human medicine; transference of resistant microbes from animals to humans could further undermine antibiotic effectiveness against human disease. A research team including Amy Chapin of the Johns Hopkins Bloomberg School of Public Health examines one possible way that resistance may be transferred from animals to humans **[*EHP* 113:137–142]**.

Previous studies have examined the potential for infection with resistant microbes via animal waste–polluted water in the vicinity of a CAFO and contaminated food products. This study offers evidence for infection occurring in a way that has not been previously considered.

According to the Johns Hopkins team, inhalation of airborne bacteria could constitute another exposure pathway. It is already well documented that air within swine CAFOs can be heavily contaminated with bacteria. Several of the bacterial species are normally present in animals and humans but can sometimes cause illness. The current study is one of the first to investigate antibiotic resistance in airborne bacteria in a swine CAFO.

Working in a swine finishing CAFO in the mid-Atlantic United States, the researchers collected air samples in December 2003 and January 2004. The air samples were then conveyed to the laboratory for bacterial isolation and speciation. Initial tests yielded 137 presumptive *Enterococcus* species isolates, and further tests confirmed that 47 were enterococci. Of the remaining 90 isolates, 44 were coagulase-negative staphylococci, 45 were viridans group streptococci, and 1 was *Micrococcus luteus*.

Each isolate then underwent testing to determine susceptibility to the antibiotics erythromycin, clindamycin, tetracycline, vancomycin, and virginiamycin. The first four of these drugs are used in human medicine; the last, virginiamycin, closely enough resembles a human drug that bacteria resistant to one will be resistant to the other. Of the five antibiotics, only vancomycin is not approved for livestock use in the United States.

All of the isolates were susceptible to vancomycin, but 121 were resistant to at least two of the antibiotics used in swine production; 115 were resistant to three. These results underscore the relationship between antibiotic use and the emergence of resistance: in the absence of use, resistance is unlikely to develop.

In some situations, the bacterial species found in CAFO air samples can cause human disease. *Enterococcus* species and coagulase-negative staphylococci are leading causes of infections in health care settings. Viridans group streptococci, normally found in the respiratory tract, are linked to life-threatening infections in immune-compromised individuals. The viridans group streptococci are also suspected reservoirs for erythromycin resistance genes, which could potentially be transferred to more pathogenic streptococci.

The researchers conclude that exposure to airborne bacteria from a CAFO presents a potential pathway for transferring antibiotic-resistant bacteria from animals to humans. CAFO workers and the people with whom they come in direct contact, as well as neighbors near the operations and areas of land where animal wastes are applied, may be especially at risk. Continuing research of the transfer of antibiotic-resistant bacteria from animals to humans needs to encompass a variety of environmental media that may serve as exposure sources.

Building and bonding. Understanding the stress-fighting effects of certain elements of the built environment may shed light on how people's surroundings affect their quality of life.

Articles from Environmental Health Perspectives are provided here courtesy of National Institute of Environmental Health Science

CAFO Applications
When Ground is Frozen, Snow-Covered or Saturated

NOTE: This document generally explains some of the requirements of s. NR 243.14, Wis. Adm. Code, and is for informational purposes only. Please review your WPDES permit and s. NR 243.14 for all applicable requirements.

Properly timing applications of manure and process wastewater

Operations should always recognize the potential increased risk of runoff whenever applying manure on ground that is saturated, frozen, or snow-covered or when rain is forecasted. WPDES permits require that CAFOs time their applications of manure and process wastewater and implement practices designed to avoid potential runoff events associated with these conditions.

Saturated Ground and Predicted Precipitation

CAFOs are prohibited from applying manure and process wastewater to saturated soils, those soils that are so moist as to prevent proper infiltration of applied materials. In addition, manure or process wastewater may not be surface applied when precipitation capable of producing runoff is forecast within 24 hours of the time of the planned application. Permittees should include information on how they plan on addressing forecasted precipitation as part of their Nutrient Management Plan (NMP). [see s. NR 243.14(2)(b)5. and 13.]

Frozen or Snow-Covered Ground

The winter spreading restrictions in s. NR 243.14 are intended to address potential water supply well impacts, fish kills and runoff events. Manure and process wastewater may not be applied when snow is actively melting and water is flowing off of a field. In addition, manure and process wastewater may not be applied on frozen or snow-covered fields with five feet or less of soil to fractured bedrock. [see s. NR 243.14(2)(b)10. and 11.]

Applications of manure that can be properly injected or immediately incorporated do not need to follow the winter spreading restrictions s. NR 243.14(6)-(8). The Department does not consider incorporation of manure on areas with more than 4" of snow as proper incorporation and is prohibited.

Except for liquid manure applications during February and March, manure applied on ground frozen in the first ½" or less of soil (or unfrozen in the first 8" of soil) and that has less than 1" of snow is not considered frozen or snow-covered and does not need to comply with winter spreading restrictions s. NR 243.14(6)-(8). These winter conditions account for reduced runoff potential associated with ephemeral frost and dustings of snow.

Solid Manure [see s. NR 243.14(6)]
Generally, CAFOs **may** surface apply **solid** manure on frozen or snow-covered ground **except** during February and March. Beginning Jan. 1, 2008, CAFOs **may not** surface apply **solid** manure during February and March on areas of fields frozen anywhere between the first ½" and 8" of soil or on areas that have 1" or more of snow.

Liquid Manure [see s. NR 243.14(7)]
Except for liquid manure that is frozen and cannot be transferred to storage, CAFOs **may not** surface apply **liquid** manure at any time during February and March regardless of soil conditions.

In addition, CAFOs **may not** surface apply **liquid** manure during other winter months when the ground is frozen or snow covered, with the following exceptions:

- CAFOs permitted as of July 1, 2007 and CAFOs constructed prior to April 14, 2003, that do not already have 180-days of liquid manure storage, may surface apply liquid manure. These CAFOs have until January 1, 2010, to install six months storage for liquid manure.
- Liquid manure that is frozen and cannot be transferred to storage may be surface applied on frozen or snow-covered ground. [NOTE: as stated above, only this frozen liquid manure may be surface applied during February and March]
- CAFOs permitted as of July 1, 2007 that already have 180-day liquid manure storage and CAFOs that were constructed on or after April 14, 2003, may surface apply liquid manure only on an emergency basis.

Any allowed surface applications of manure must comply with the applicable restrictions and setbacks in NR 243.15(6)-(8) and Tables 4 (solid manure) and 5 (liquid manure). In addition, all surface applications of manure or process wastewater must

meet a winter acute loss index value of 4 or less using the Wisconsin Phosphorus Index.

Whenever a permittee surface applies manure or process wastewater on frozen or snow-covered ground, it must inspect the application site during and shortly after the application and report whether any applied materials ran off the application site.

What qualifies as an allowable "emergency application" of liquid manure?

Operations that have 180-day storage, may surface apply liquid manure on an emergency basis provided the following conditions are met:

- The liquid manure storage facility has been properly maintained and operated to provide for 180-days of storage.
- The surface application is necessitated by the exceedance or expected exceedance of the storage facility's margin of safety.
- The margin of safety exceedance is the result of unavoidable or unforeseen circumstances beyond the control of the permittee, such as unusual weather conditions or equipment failure.
- The permittee follows appropriate notification and reporting requirements regarding the emergency application.

Margin of safety exceedances at operations with 180-day storage that result from the failure of the permittee to properly design or maintain storage capacity do not qualify as the basis for emergency applications allowed as part of a WPDES permit. [see NR 243.14(7)(d)]

What restrictions apply to applications of frozen liquid manure?

Frozen liquid manure that cannot be transported to a manure storage facility may be surface applied on frozen or snow-covered ground in accordance with Table 5. Prohibitions on liquid manure surface applications during February and March do not apply to frozen liquid manure. [see NR 243.14(7)(f)]

What restrictions apply to process wastewater applications on frozen or snow-covered ground?

WPDES permits conditions that regulate the land application of process wastewaters (e.g., milking center wastes, egg wash water) to frozen or snow-covered ground are based on restrictions for industrial wastes contained in ch. NR 214, Wis. Adm. Code. These restrictions include:

- A 500' setback from inhabited dwelling which may be reduced to 200' if the wastewater is incorporated and written consent is received from the affected occupants.
- A 1000' setback from municipal water supplies and 250' from all other potable water supplies.
- A 200' setback from surface waters
- Fields must have a 2% slope or less. The Department may approve applications on fields with up to 6% slopes.
- The maximum hydraulic application loading rate is 6,800 gallons/acre/day.

All other requirements in NR 243 and CAFO WPDES permits (e.g., phosphorus-based nutrient management, application restrictions within the SWQMA) apply to applications of process wastewater.
[see s. NR 243.14 for references to process wastewater]

How do restrictions on the timing of manure and process wastewater applications impact my Nutrient Management Plan?

In order to comply with the winter spreading restrictions, CAFOs must create a winter spreading plan that is part of their Nutrient Management Plan (NMP) that addresses the following areas:

- Restriction/hazard area maps for cropped fields showing applicable setbacks and prohibition areas (for example, setbacks in Tables 4 and 5 and fields with 5' or less of soil over fractured bedrock).
- Identification of an adequate number of fields and acreage that meet the restrictions in Table 4 and 5 as well as allowable application rates on these fields that would result in a winter acute loss index value of 4 or less. Operations with 180-days of liquid manure storage must also identify fields to address potential emergency applications of liquid manure.
- Should a permittee choose to stack solid manure to avoid applications in February and March, the permittee must submit stacking sites for approval as part of the NMP. Stacking criteria and requirements are contained in s. NR 243.141.

In addition, permittees must identify how they plan on identifying storm events capable of producing runoff as part of their NMP.

CAFO Applications When Ground is Frozen, Snow-Covered or Saturated Wisconsin DNR

Manure and process wastewater may not be applied on frozen or snow covered fields within five feet or less of soil to fractured bedrock.

Manure may not be applied during February and March.

Manure may not be applied when snow is actively melting.

CAFOs may not surface apply liquid manure at any time during February and March regardless of soil conditions.

All surface applications of manure or process wastewater must meet a winter acute loss index value of 4 or less using the Wisconsin Phosphorus Index.

There is a 500-foot setback from inhabited dwelling for applying process wastewater on frozen or snow-covered ground. There is a 250 setback for potable water supplies.

The maximum hydraulic application loading rate is 6,800 gallons/acre/day.

WISCONSIN
DEPT. OF NATURAL RESOURCES

Socio-Economic

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

What about our property values? What is the economic impact of that?

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

DG

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

What about all the people who have ponds on their property? These will go down tremendously with that much water being pumped.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarificati[redacted]ecords Law.

Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

• Wl
• Fishing
• Recreation
• High CAP
• Quality of Life

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

III, G, 2 Rivers & streams I have been a land owner on Ten Mile Creek for about 35 yrs. over the years I have seen the charactics of the stream change, for Example the construction of the Cranberry marsh made a Dramatic change in Flow when filling thier Reservoir since they completed fill the Reservoir the stream has look Better can the stream survive with →→

IV E, 5 b Trails and Scenic Rds 5c Hunting & Trapping →

(5d) Fishing. Our Family has enjoyed Trout fishing for years on the Ten Mile Can the fishing continue to be as good if water levels are lowerd due to increase demand of water usage.

IV (J) - Life style Rural

See Back of Sheet

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information [redacted]

IV E56, Our family has been able to snowmobile thruout the Saratoga Area using the Designated Snowmobile Trail system. provided buy Area Volunteer Snowmobile clubs and generous land owners providing land Easements. will these Trails continue to be Accessed if wysocki operation would be approved? Can this be provided under the Permit Process? It is something that is currently offered By the Previous land Owners and adds to the Recreational Value of the Surrounding Forests and Trails.

→ Constant pumping from High Capacity wells throughout the growing season seems to me the stream will not survive all the Demands for water use. this will need to be addressed.

IV The rural Lifestyle of the Forest and Streams has provided for a wonderful recreational experience for My Family & neighbors and Tourists Traveling from out side of the Saratoga Area Can this be maintain with the proposed Camp proposal. I would think not with more than 6000 acres de forested!

WISCONSIN
DEPT. OF NATURAL RESOURCES

DW

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

I realize individuals must have their water tested for a comparison base for future complaints but does the DNR do the same on behalf of the people?
My concern is for my drinking water quality, the dust being generated by the farming, the noise generated by well pumps and trucks and the over all visual aspects of the country. (Not to mention the smell)

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

DG

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Concern: private and municiple well protection from nitrates and anti biotic poisoning

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: _____

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

WATER RESOURCES

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

How does CAFO protect H_2O quality & quantity available to existing wells in immediate area of Saratoga & possibly town of Rome?

Will Cafo put millions of dollars into a trust fund to protect the H_2O quality BEFORE permit application, approval etc..

Will this trust fund be separate & monitored by a private volunteer group of concerned citizens. Will this volunteer group be selected prior to permit approval?

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

DG

WISCONSIN
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Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

1.) 49 Hi-cap wells - what is the cone of depression?
- what range outward from each well head is the cone of depression?
- how deep is each well?
- how does each Hi-cap well impact the volume of water drawn out?
- how does each Hi-cap well impact the nitrates and pesticide levels?
- how does ~~the~~ each hi-cap well impact shallow wells and sand points?
- is the owner of hi-cap well in any way financially responsible to replace any private wells or sandpoints impacted by the hi-cap well?

- What is the re-charge rate for the aquifer?
- what size well-head will each well be?
- Drought - how does this affect well draw-down
- How does the draw-down affect fire department access to water?
- is home owner's protection for fire insurance increased due to hi-cap well impact?

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Name: [redacted]

Contact Information: [redacted]

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

WATER RESOURCES

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

How does CAFO protect H_2O quality & quantity available to existing wells in immediate area of Saratoga & possibly town of Rome?

Will Cafo put millions of dollars into a trust fund to protect the H_2O quality BEFORE permit application, approval etc..

Will this trust fund be separate & monitored by a private volunteer group of concerned citizens. Will this volunteer group be selected prior to permit approval?

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Name: [redacted]

Contact Information: [redacted]

DG

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DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

What are our rights, if the farm goes through, if our water quality goes bad (high nitrates/bacteria)? What are our rights if our water starts drying up? (dry well) We have no drilled well we have a point, Are they (Wysocki) going to have to drill us a well then?

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: _____

Contact Information: _____

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

1) Effect on property values
2 Long term impact (5-10+ yrs) on water quality & quantity
3) Long term impact on Ten Mile Creek & other creeks in the area of high capacity wells (5-10+ years)

Enclosed pictures of Ten Mile Creek - 2 from 1997 when cranberry marsh & high cap. wells for crops up stream started. This was a drought year. If high cap. well (#49) were in place there would be no water.
When we built our home here in 1989 - waders were necessary to navigate for Trout fishing.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WATER RES

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

HCW's have been shown to have a neg. impact on ground water in our area. At what point will our wells and streams and lakes be destroyed.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

DG

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Please protect our limited water supply from rich farmers + WALKER

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: [redacted]

WATER RES.

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

HOW WILL THE HI CAP WELLS IMPACT THE 14 MILE CR + WATER GOING TO CAMELOT / TRI-LAKES?

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: _____

Contact Information: _____

WISCONSIN
DEPT. OF NATURAL RESOURCES

D9

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

Concern: Ground water in Central Sands region already high in Nitrates in 70% of area – why add more

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarification of your comments, if necessary. All comments subject to Wisconsin's Open Records Law.

Name: [redacted]

Contact Information: _____

DG

WISCONSIN
DEPT. OF NATURAL RESOURCES

Saratoga Town Hall Public Listening Session

Issues Identification Comment Form

For the Proposed

Golden Sands Dairy

August 23, 2012 Meeting

Public information gathering for the Environmental Impact Statement (EIS). Please clearly state the issue(s) you feel should be addressed by WI Department of Natural Resources in the EIS:

When we test our water, what pesticide tests need to be done? At what location (business)? What kind of pesticides will the dairy farm be using on the land? I would like to know all the chemicals they will be using on the fields.

Completion of this form and inclusion of personal information is voluntary. We will use your contact information to seek clarifi[redacted] Open Records Law.

Nam[redacted]

Contact Information: [redacted]