UNIVERSITY OF ARKANSAS
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Agriculture and Natural Resources

Soil Phosphorus Levels: Concerns and Recommendations

Dr. Mike Daniels
Environmental Management Specialist - Agriculture

Dr. Tommy Daniel
Professor, Soil and Water Chemistry, Agronomy Department
University of Arkansas

Dennis Carman
State Conservation Engineer
Natural Resources Conservation Service

Robert Morgan
Engineering Supervisor, Non-Point Source Pollution Management Section
Arkansas Soil and Water Conservation Commission

John Langston
Extension Agricultural Engineer/Section Leader

Dr. Karl VanDevender
Extension Agricultural Engineer

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Phosphorus -- Necessary for Plant and Animal Growth

Phosphorus (P) is a naturally occurring element in the environment that can be found in all living organisms as well as in water and soils. It is an essential component for many physiological processes related to proper energy utilization in both plants and animals. Phosphorus can be added to the environment by man's activities as point source discharges or as non-point source runoff. Typical sources include industrial and municipal wastewater discharges or runoff from agricultural lands or urban areas. This publication addresses the concerns arising from land application of animal manures.

Plants derive P needs from soil. Livestock, in turn, derive part of their P needs from plant materials. However, much of the naturally occurring P in grains is in an indigestible form. Therefore, inorganic P sources are added to poultry and swine feeds to ensure adequate nutrition and to prevent rickets. As a result, much of the dietary P passes through livestock and poultry and is excreted in animal manure. Utilizing animal manure as a fertilizer on crop and grazing land can recycle nutrients.

Plants uptake P from soil mostly in the orthophosphate form. Native soil P levels are often low enough to limit crop production. Both inorganic P fertilizers (treated rock phosphate) and organic P sources (animal manures) are equally adept at supplying the orthophosphate ion and correcting P deficiencies in soil. Most of the P in animal manure is in an organic form and must be converted to plant-available forms via soil biological activity, a process known as mineralization. The net effect of this characteristic is that P derived from animal manure may act more like a slow-release fertilizer than commercial inorganic fertilizers, which are more soluble and readily available to plants.

Understanding Soil Test Numbers

The University of Arkansas' P fertilizer recommendations for crops are based on soil testing procedures. Soil samples are analyzed to determine the current levels of P available to the crop. Research-based recommendations are then made on the amount of additional P needed to achieve crop production goals.

When discussing P, it is important to make the distinction between elemental phosphorus (P) and phosphate (P_2O_5). Soil test results are usually reported as elemental P. Animal manure analysis results are usually reported as the amount of phosphate equivalent or P_2O_5, because commercial fertilizers are formulated with P_2O_5 (2.29 pounds of P_2O_5 is the equivalent of 1 pound of P).

Soil test phosphorus (STP) is not an indication of total P in the soil but how much is available for plant use. If STP numbers are to be compared, the laboratory test method for extracting P

EXHIBIT 2

and how the number is reported (parts per million or pounds per acre) must be known. Different testing labs use different methods for extracting P, producing different test results that are difficult to compare even for the same sample. The University of Arkansas Soil Testing Laboratory uses the Mehlich III method, and the results are reported in pounds per acre of elemental P. Other soil testing labs may report their results in parts per million (ppm) without making the conversion to pounds per acre (lbs/A). This conversion from ppm to lbs/A involves assuming that a 6-inch deep layer of soil (furrow slice) covering one acre weighs 2,000,000 pounds. To convert soil test results from ppm to lbs/A, multiply the value in ppm by 2. For example, a soil test P value of 150 ppm is correlated to 300 lbs/A.

The Phosphorus Concern

Commercial fertilizers are commonly applied to croplands in a mixture of nitrogen, phosphate and potash (N, P_2O_5, and K_2O) that is balanced to meet the nutrient needs of the desired crop. However, nutrients in livestock manure are not balanced with respect to crop requirements.

TABLE 1
Average Nutrient Values for Manure Samples Collected by Arkansas Producers*

	N	P_2O_5	P	N/P_2O_5	
Broiler Litter	56	54	23.6	1.04	Lbs/ton
Dairy Manure	6	4	1.75	1.50	Lbs/1,000 gal
Swine Manure	14	13	5.68	1.08	Lbs/1,000 gal

*These values are derived from manure samples collected by producers and sent to the University of Arkansas Agricultural Diagnostics Laboratory. The nitrogen values are the total nitrogen concentration. The phosphorus values are the P_2O_5 and P concentrations as marked.

Table 1 reveals that N and P_2O_5 are found in about equal amounts in broiler litter. However, Table 2 indicates that typical forage crops require about 2½ to 4 times as much N as P_2O_5.

TABLE 2
Nutrients Removed Per Ton of Forage Dry Matter
(Average of Arkansas Forage Tests from 1984-1996)

	N	P_2O_5	P	K_2O	N/P_2O_5
	pounds removed per ton of forage production				
Alfalfa	58*	14	6	56	4.14
Bahiagrass	31	8	3	34	3.88
Bermudagrass	40	12	5	44	3.33
Clover	43*	12	5	44	3.58
Fescue	36	14	6	50	2.57
Legume/grass	39*	12	5	43	3.25
Ryegrass	39	16	7	54	2.44
Sudangrass	37	14	6	47	2.64
Wheat	36	13	6	40	2.77

*N from N fixation not N fertilizer

Growers with confined livestock and poultry operations have tons of P-enriched feed brought onto the farm. Much of that P passes through the animals and is excreted in manure. In turn, the manure is spread on fields to take advantage of the nutrient value and organic matter. Crops most readily respond to nitrogen, so growers have historically applied enough manure to meet crop nitrogen needs. This results in applying several times the needed amount of P (refer to Tables 1 and 2 concerning nutrient values and the example application scenario below).

EXAMPLE SCENARIO
Comparing N vs P_2O_5 Based Litter Applications

This example is for a broiler farm consisting of four houses that places a nominal 20,000 four-pound birds per house and averages five flocks per year. The litter produced will be applied to produce 4 tons of fescue per acre.

Assumptions

- Litter is produced at a rate of 1 ton per 1,000 birds per flock.
- The litter contains 60 lbs N/ton and 55 lbs P_2O_5/ton.
- The fescue produced will contain 36 lbs N/ton and 14 lbs P_2O_5/ton.
- 25% of the N is lost during litter application to volatilization.
- No other mineralization, denitrification or leaching losses for N or P_2O_5 are considered.

Litter Nutrient Information

- 400 tons litter/year
- 18,000 lbs N available/year
- 22,000 lbs P_2O_5 available/year

Fescue Nutrient Information

- 4 tons fescue/A
- 144 lbs N required/A
- 56 lbs P_2O_5 required/A

Application Comparisons

N Based	P_2O_5 Based
• 125 A required	• 393 A required
• 3.2 tons litter/A	• 1 ton litter/A
• 144 lbs N applied/A	• 46 lbs N applied/A
• 176 lbs P_2O_5 applied/A	• 56 lbs P_2O_5 applied/A
• N needs met	• 98 lbs N deficit/A
• 120 lbs P_2O_5 surplus/A	• P_2O_5 needs met

Comment

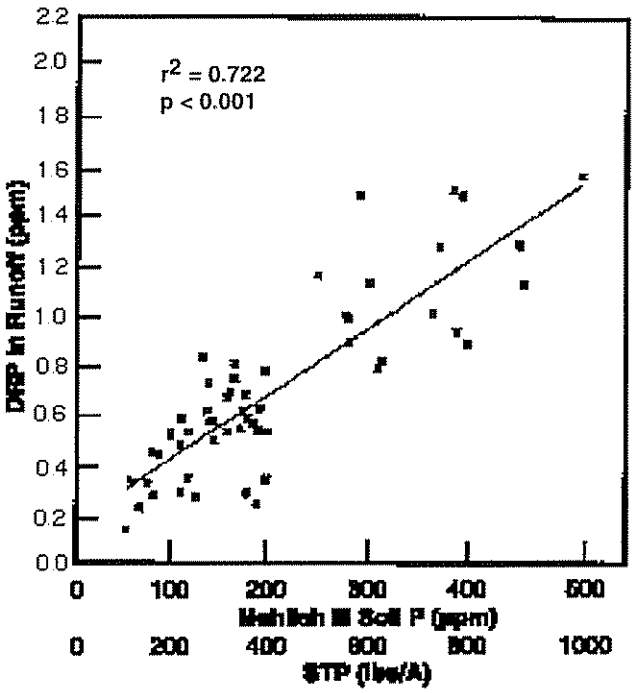
A P_2O_5 surplus of 120 lbs/A does not imply that the STP will increase by 120 lbs/A. Due to soil chemical reactions, significant amounts of the surplus P will become bound in the soil and unavailable for plant use. Because soil test procedures were developed to indicate plant-available P they will not measure bound P. For this reason, a 120 lbs/A surplus P_2O_5 will increase the STP level by significantly less than 120 lbs/A.

Repeated application of manure based on nitrogen needs causes P to accumulate in the soil. In some cases, 10 years of repeated application has caused very high STP levels, particularly on pasture-lands where crops have not been removed. In the past, this build-up has not been a cause for concern. Phosphorus is a naturally occurring nutrient and, even at high levels, is not detrimental to crop production. It is also relatively stable once attached to soil particles. Phosphorus was once thought to have significant movement off fields only if soil was moved by erosion.

For land with high STP levels, it is now known that appreciable amounts of soluble P can exist in the runoff water from these areas and can significantly impact water quality in nearby streams and lakes. Looking at the top one inch of the soil profile, recent research has shown that the concentration of P in runoff increases as STP increases.

FIGURE 1

Relationship Between Mehlich III Extractable P in Captina Surface Soil and Dissolved Reactive P (DRP) in Runof (based on STP levels in the top 1 inch of soil)



Adapted from Sharpley, A.N., T.C. Daniel and D.R. Edwards, "Phosphorus Movement in the Landscape." *J. Prod Agric.* Vol 6, No. 4, 1993.

Phosphorus is not toxic and would not be a problem except P is the nutrient that limits biological activity in most of our clear water lakes and streams. Nitrogen and potash generally occur naturally in the environment in sufficient quantities to support algae and plant growth in water bodies. Insufficient P in most inland water bodies keeps the clear water lakes and streams from being congested with algae and aquatic vegetation. Very small increases in P can trigger unwanted algae and vegetative growth. Levels of P exceeding critical values for algae growth can lead to the acceleration of eutrophication, the natural aging process of a lake that is characterized by excessive biological activity.

Consequences of accelerated eutrophication include degradation of recreational benefits and drinking water quality, which in turn can increase treatment costs. Advanced eutrophication can also reduce aquatic wildlife populations and species diversity by lowering dissolved oxygen and increasing the biological oxygen demand (BOD). Eutrophication from excessive P has not generally been considered a public health issue like other contaminants derived from agricultural runoff, such as nitrates or pathogenic bacteria. However, there are toxic algae that can flourish with increases in available nutrients, which is causing researchers to focus more attention on the isolated events that have occurred in other states.

How Much Soil Test Phosphorus Is Needed?

Arkansas scientists agree that there is no agronomic reason or need for STP levels to be greater than about 80 to 100 pounds (P by Mehlich III extraction) per acre. Typical forage crops will annually remove from 8 to 16 pounds of P_2O_5 per ton of production. As an example, bermudagrass removes about 12 pounds per ton or 72 pounds of P_2O_5 annually for a 6 ton per acre crop. (Divide P_2O_5 by 2.29 to determine elemental P; 72 lbs P_2O_5 = about 31 lbs P)

It must also be emphasized that P contained in plant material is recycled to the soil unless it is removed, either by crop or forage harvesting, soil erosion or runoff. On grazing land, most P is recycled to the soil in manure. Only a small portion of the P uptake in the animal is retained and removed from the land with the animal.

The environmental concern of letting P accumulate to very high levels in the soil is the long period of time required to reduce STP to levels normally recommended for agronomic production. High levels of P can require as many as 15 to 20 years of continuous crop harvesting for removal, with no additional P from any source during that time

How Much Soil Test Phosphorus Is Too Much?

A rigid, maximum STP level has not been set by soil scientists or the Natural Resources Conservation Service. However, one suggested limit that has been debated is 300 pounds P per acre (by the Mehlich III extraction testing method). This number has been suggested as an upper limit simply because it is much more than the available P needed for crop production (about three times more than needed), and it is hopefully low enough to avoid eutrophic runoff. The environmental impact of an STP level of 300 lbs/A has not been established at this time. The variables and unknowns in the movement (transport) of P once it is in runoff water make its environmental impact difficult to assess. It should also be noted that the concentration of dissolved P in runoff water changes with rainfall intensity and duration, and the research has been under very specific rainfall and runoff conditions.

Soil test phosphorus is clearly a good indicator of when an appreciable concentration of dissolved P may be in runoff water. It does not, however, offer any indication of the amount (rate) of runoff water that may be generated for a given set of conditions. The total amount of P leaving a field is a function of the runoff P concentration and the runoff volume. The real issue is not the P concentration in runoff from the edge of any one field but the total P load transported to the stream or lake from an entire watershed. The maximum amount of P that can be assimilated in a watershed without causing eutrophication depends on a number of factors including STP levels. Distance from significant streams or water bodies, slope, soil type, buffer strips and crop or forage cover are potential factors, as are the characteristics of the streams and lakes themselves. However, soil testing, if properly used, may be the most significant tool for assessing the potential for high P concentrations in runoff water.

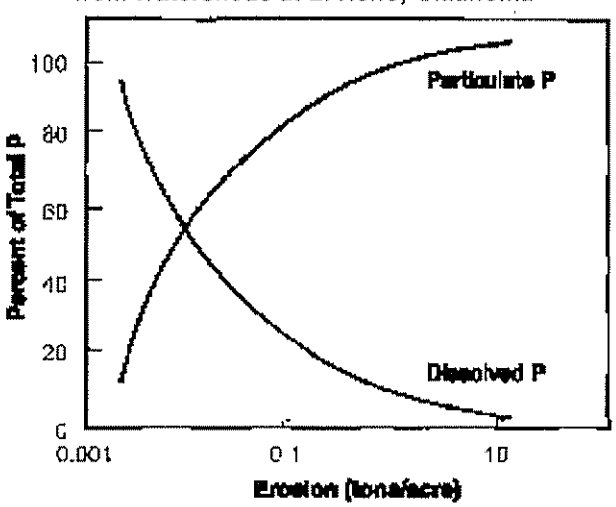
The real issue is not the P concentration in runoff from the edge of any one field, but the total P load that is transported to the stream or lake from an entire watershed.

Some watersheds with a high percentage of cropland and pastureland receiving animal manure may require restricted P applications to avoid excess P loading of streams and lakes fed by that watershed. Maximum STP levels may be appropriate for these watersheds. Watersheds with a low population density of livestock and poultry farms may be able to tolerate higher STP levels on fields without harmful effects to water quality. However, to effectively manage P in every watershed, the factors affecting the movement of P from application sites to streams and lakes must be considered.

Recommendations and Concerns

- An STP of 300 lbs/A is a good indicator that P build-up in the soil is a valid environmental concern for that particular field. Growers with management alternatives for manure or litter should reduce or totally avoid animal manure or P applications from any source on high P fields. Current scientific evidence is limited on how much P can be tolerated for all fields in all situations. However, it is known that high P fields can require as much as 15 to 20 years of continuous crop harvesting, with no added P during that time, to reduce high STP levels. Therefore, it is to the landowner's advantage not to let STP build to high levels if he has alternatives for management.
- A STP of 300 lbs/A should not be considered an absolute maximum number for P applications at this time except in specific watersheds that have been determined to have excess P loads harmful to water quality and the environment.
- Growers should be encouraged to make commercial fertilizer applications formulated with N and K_2O to meet the forage needs of fields where animal manure is no longer applied. It must be recognized that decreased fertility will result in a loss of forage cover and increased erosion, which could create a greater P problem in runoff than continued manure applications. Research has shown that when erosion is kept to a minimum, dissolved P is predominant in runoff water, but as erosion increases the percentage of particulate P in the runoff increases.

FIGURE 2
Percentage of Total P as Dissolved and Particulate P as a Function of Erosion in Runoff from Watersheds at El Reno, Oklahoma



Adapted from Pote, D. H., T. C. Daniel, A.N. Sharpley, P. A.Moore, Jr., D. R. Edwards, and D. J. Nichols, "Relating Extractable Soil Phosphorus to Phosphorus Losses in Runoff," *Soil Sci Soc Am J* 60:855-859 (1996)

- When applying commercial fertilizer on fields with STP at 100 or more pounds per acre, do not use fertilizer with P in the formulation. It should be N (ammonium nitrate or urea) or N-0-K_2O, which is nitrogen and potash with no phosphorus

- When making N-based early season applications with manure, late season commercial fertilizer applications should be N or N-0-K_2O with no P in the formulation.

- All livestock and poultry producers with confined animal operations should have a nutrient management plan prepared for their farm. The application rates should consider P. Low fertility fields with low P could have N-based applications for a limited time, but all fields with repeated animal manure applications will ultimately require applications that consider P.

- Proper soil sampling techniques are critical to the accurate characterization of STP in pastureland. Samples should be collected from 12 to 15 locations within a field in a zigzag pattern across the field. These samples should be mixed together and a composite sample taken from the mixture. This provides the most representative sample possible. Also, care should be taken to collect a sample approximately 6 inches in depth. Producers are encouraged to contact their local county extension office for sampling instructions prior to sampling.

- In Arkansas dry manure or litter is not regulated, and growers have more options for handling excess nutrients on their farms. Dry manure has a higher nutrient density and can be hauled greater distances than liquid manures with fewer economic hardships. Liquid manures in Arkansas are regulated, and growers have fewer options for handling excess nutrients. The permits specify the minimum required acreage and the land application areas for each farm.

- Most livestock and poultry producers spread litter based on the best management practices at the time they started in business, only to find now that they may have inadequate land for P-based application rates. As a result, restrictive P regulations could cause financial hardship for many producers and affect Arkansas' agricultural economy unless economically feasible alternatives to land application are developed. High-quality water is also important for the economy and the people of Arkansas, so additional research is need to help producers find better ways to manage, utilize or market the valuable nutrients in excess manure.

- Carefully prepared nutrient management plans for all confined livestock and poultry operations, implementation of current technology with best management practices and limited P applications in certain critical watersheds should protect our water until new research and good science can further define more specific P recommendations.

- Additional solutions and management practices need to be developed and implemented. The areas of emphasis should include reducing the P concentrations in feeds while maintaining production, management practices to reduce the transport of P from the application areas to water bodies and the development of economical long distance transportation of manure to land areas in need of P.

References

Sharpley, A. N., T. C. Daniel and D. R. Edwards, "Phosphorus Movement in the Landscape," *J. Prod. Agric.*, Vol. 6, No. 4, 1993.

Pote, D. H., T. C. Daniel, A. N. Sharpley, P. A. Moore, Jr., D. R. Edwards and D. J. Nichols, "Relating Extractable Soil Phosphorus to Phosphorus Losses in Runoff," *Soil Sci. Soc. Am. J.* 60:855-859 (1996).

DR MIKE DANIELS is environmental management specialist - agriculture JOHN LANGSTON and DR KARL VANDEVENDER are Extension agricultural engineers with the Cooperative Extension Service, University of Arkansas, Little Rock DR TOMMY DANIEL is professor, soil and water chemistry, Agronomy Department, University of Arkansas, Fayetteville. DENNIS CARMAN is state conservation engineer, Natural Resources Conservation Service, Little Rock ROBERT MORGAN is engineering supervisor, Non-Point Source Pollution Management Section, Arkansas Soil and Water Conservation Commission, Little Rock

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Managing Phosphorus from Animal Manure

Hailin Zhang
Waste Nutrient Management Specialist

Gordon Johnson
Nutrient Management Specialist

Mitch Fram
Area Water Quality Specialist

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Applying animal manure to farmland is an appropriate and environmentally sound management practice for livestock and poultry producers. Land applications recycle nutrients from manure to soil for plant growth and add organic matter to improve soil structure, tilth, and water holding capacity. As with other nutrient sources, improper use of manure can result in environmental damage. One of the major concerns associated with manure application is the buildup of phosphorus (P) in soils, and the subsequent impact of P on surface water quality. This fact sheet provides basic information on manure P and some options for better management of P from animal manure.

What is the Nature of Manure Phosphorus?

Phosphorus occurs in animal manure in a combination of inorganic and organic forms. In general, 45 to 70 percent of manure P is inorganic. Organic P constitutes the rest of total P. Essentially, all inorganic P is in the orthophosphate form, which is the form taken up by growing plants. Much of the organic P is easily decomposable by soil microorganisms to the inorganic form. Factors such as temperature, soil moisture, and soil pH affect the P mineralization rate.

The availability of P from manure ranges from 80 to 100 percent, compared to 100 percent availability in commercial fertilizers. When nutrient application is based on P, 90 percent availability normally is used for application rate calculations. In other words, the total P in manure should provide nearly the same effect as an equal amount of P from commercial fertilizers, as far as crop response is concerned.

How Much P is Present in Manure?

Nutrients in manure vary greatly from operation to operation, depending on animal species, the size of animals, and the ration fed. Manure P, like other nutrients, is normally not uniform even in the same storage facility, depending on various factors such as the amount of bedding, the amount of moisture entering the system, and how the manure is handled and stored. Therefore, the first step in developing an effective manure application plan is to determine the amount of nutrients in the manure. It is strongly recommended that the nutrient content of manure be determined by laboratory analysis annually or when manure handling procedures change. Table 1 shows the average of major nutrients in different types of manure generated in Oklahoma. Broiler litters are relatively high in all three major nutrients, especially phosphorus.

Table 1. Average nutrient analyses of major types of manure in Oklahoma.

Manure Type	*Total N*	*P_2O_5*	*K_2O*	*N:P Ratio*
	lb/ton			
Stockpiled Feedlot Manure	24	21	25	1
Broiler Litter	58	61	47	1
	lb/1000gal			
Lagoon Effluent	4.2	1.0	5.0	4

What Happens to P after Manure is Applied to Soil?

Manure contains organic and inorganic phosphate compounds. The inorganic P initially is quite soluble and available; however, when it comes in contact with soil, various reactions begin to take place. Those reactions make phosphate less soluble in water and less available to plants. The rates and products of these reactions are dependent on soil pH, moisture, and the minerals already present in the soil.

Generally, phosphate ions react with soil in two ways:

1. Adsorbing onto soil particles
2. Chemically combining with elements in the soil such as calcium (Ca), aluminum (Al), and iron (Fe), forming compounds that are solids (precipitates).

The adsorbed phosphate and the newly formed compounds are only slowly available to plants. The easily dissolved compounds of phosphate form more insoluble compounds that cause the phosphate to become fixed and unavailable to plants. The texture of soil affects its capacity to hold P by adsorption. Most fine-to-medium textured soils have larger capacities to adsorb phosphate than coarse-textured soils. On the other hand, soil pH determines the kinds of phosphate

EXHIBIT 3

compounds formed when P precipitates. Calcium phosphates form in neutral and alkaline soils, while aluminum and iron phosphates form in acid soils.

As adsorbed and precipitated P increases, the P in soil solution (water held in the soil matrix) also increases, due to an equilibrium between solid and dissolved forms of P. Soil solution P is subject to runoff loss during storm events. More P will be subject to loss when soil P approaches saturation or over-saturation. Saturation means that all the sorption sites on soil particles are occupied by P, and all Ca, Al, Fe and other elements capable of precipitating P are used up. Therefore, the soil P holding capacity is a function of clay and organic matter content, soil pH, and the amount of calcium carbonate and aluminum or iron oxides of a particular soil.

Why Does Soil P Increase?

In many areas of intensive livestock and poultry production, manure normally is applied at rates designed to meet crop nitrogen (N) requirements. This often results in a buildup of soil test P (STP) above sufficient amounts for optimal crop yields. This is because the amount of P in manure is considerably greater than the amount removed in harvested crops. For example, the N:P ratio of most poultry litter and feedlot manure is close to 1:1 (see Table 1), but most crops require an N to P ratio of 8:1. While N gets used, P builds up in the soil. Long-term research, conducted at the OSU Agricultural Experiment Station at Lahoma, documents soil-P depletion and enrichment from 27 years of annual applications of zero to 80 lb/acre fertilizer P for winter wheat production (Figure 1). Change in the soil test P index is well correlated with net P input or removal. About 14 lb P_2O_5/acre is required to raise or lower the STP by 1.0 unit for this silt loam soil. The amount of P_2O_5 needed to change STP may vary with soil texture, pH, and other soil properties. There may also be differences between inorganic P fertilizer and organic P sources, such as animal manure and biosolids. When manure is surface-applied, as in pasture and hayland systems, STP may increase faster than in cropping systems where manure is incorporated, or mixed well, with soil.

Soil P testing is a management practice that is used to predict the amount of P needed in a fertilizer or manure program for optimum yield. When soil testing shows a low to medium P index, a yield response to applied P should be expected. If the soil test P index is high or excessive, there is normally no added benefit from additional P; however, there is an increased potential for P leaving the field and entering water bodies (Figure 2). Science-based fertilizer recommendations used by Oklahoma State University, based on decades of field and laboratory research, show a STP value of 65 is adequate for production of most crops. Recent research indicates a field-average soil test of 120 (based on 15 to 20 cores per field) can be used to ensure that 95 percent of the area of a field has sufficient P with soil test levels of 65+ and to prevent any localized deficiencies due to soil variability. Therefore, nutrient utilization standards that are protective of the environment would require that animal manure applications do not result in soil test phosphorus levels that exceed 120.

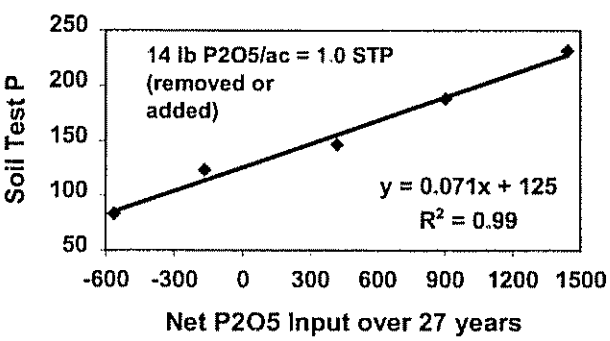

Figure 1. Changes in soil test P resulting from 27 years of fertilizer input and wheat grain removal at Lahoma, Okla.

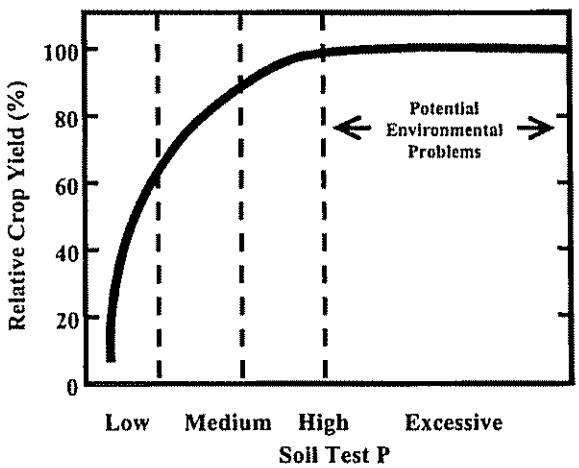

Figure 2. Relationship between soil test P levels, relative crop yield, and the potential for environmental problems.

How Does Soil P Affect Water Quality?

Most soils have a large capacity to retain P. Even large additions of P will be mostly retained by soils provided there is adequate contact with the soil. However, increasing the amount of P in soils results in increased levels of P in soil solutions (Figure 3). Generally, this will result in small, but environmentally important, increases in the amount of dissolved P in water that passes over or through soils.

Adsorbed and precipitated phosphates are associated more with fine soil particles than with coarse particles. When soil erosion occurs, and soil particles and organic matter are carried to a stream or lake, this sediment-bound P becomes a source of P in water. These two main mechanisms for transport of P to water resources are illustrated in Figure 4.

Excessive levels of P in water often promote eutrophication and cause water quality problems. These problems limit water use for fisheries, recreation, industry, and drinking due to the increased growth of undesirable algae and aquatic weeds, and shortage of oxygen. Lake water P concentrations at around 0.05 ppm are considered critical; at values above this, eutrophication is accelerated.

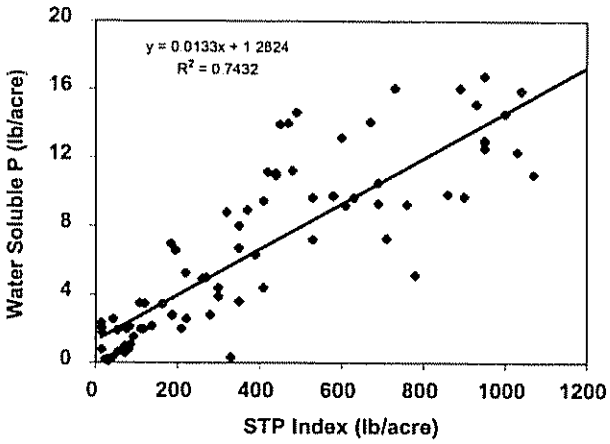

Figure 3. The relationship between soil test P index (Mehlich 3 extractable) and water soluble P.

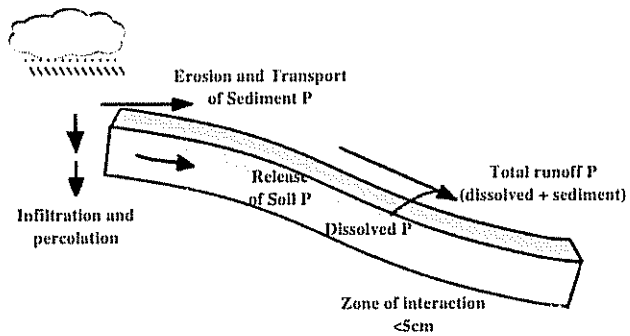

Figure 4. Mechanisms of phosphorus transport over landscape: erosion and runoff.

What Are the Options for Managing Manure P?

The main factors affecting P losses from manured fields include soil test P levels and the movement of P to surface water. Therefore, the most effective management practices for preventing P loss are managing P sources and reducing runoff and erosion.

A. Phosphorus Source Management

1. Reducing off-farm inputs of P in feed

Manipulation of dietary P intake by livestock has received a lot of attention lately. Enzyme additives, such as phytase, for animal feed may increase the availability of P from plant sources during digestion and therefore reduce the need for mineral P addition. Use of low-phytate grains in feeds would have a similar effect.

2. Soil P management

Many soils in Oklahoma are high in P. Once soil test P (STP) levels become excessive, further applications of P will increase the potential for P movement and do not provide any potential agronomic benefits. The Soil, Water and Forage Analytical Laboratory at Oklahoma State University uses the Mehlich 3 method to assess soil P availability. Research has shown that when STP reaches 65, it is 100 percent sufficient for all crops. Soil testing can help identify low P fields on your farm. Fertilization of soils susceptible to P loss or close to P-sensitive water bodies should be based on soil test recommendations (agronomic rates) when applying any source of P, to prevent P buildup in soils and to minimize P loss to surface water.

Accumulation of P in the surface soil (top one to two inches) occurs when manure is broadcast without incorporation on pasture or no-till fields. Testing has shown that STP from the zero to two-inch depth can be four times as high as that from two to six-inch samples. This may increase P loss in runoff because the near-surface horizon is the most reactive zone during a storm event. Subsurface placement of manure and periodic plowing of no till soils, if possible, would distribute surface P throughout the upper root zone, decrease exposure to surface runoff and increase crop uptake.

Forages with a high yield potential can be used to remove P from high P fields, but it is a slow process. Bermudagrass and certain warm-season annual grasses have the potential to produce large amounts of hay under Oklahoma conditions and thus remove relatively large quantities of P. Bermudagrass contains about 0.2 percent of P; thus, it can remove 20 lbs. of P (or 46 lbs. of P_2O_5) per year if five tons/acre is harvested. However, this would only reduce soil test P by about three. It will take about 30 years to reduce soil test P index by 100 units. P removal from high-P fields is more efficient if a combination of both warm- and cold-season forages is used.

3. Manure management

All manure has beneficial values in crop production. Manure analysis, combined with soil testing, is needed to determine the nutrient value and decide where and how much to apply. Manure should be applied where needed most, based on soil test results, not just to the fields nearest the barns. Preferably, the application rates are based on soil and crop P requirements instead of N needs. Additional N fertilizer should be used to meet crop N needs. If a manure market is available and economically viable, producers should consider selling manure to other farms where manure nutrients can be utilized. Manure buyers whose fields test below sufficiency in STP may consider applying two to three crop years' worth of manure-P at one time, based on soil test recommendations and N needs, to save on application costs or to take advantage of manure market considerations. Commercial N would be applied in the following seasons.

B. Phosphorus Transport Management

1. Control erosion and runoff

Phosphorus loss via erosion and runoff may be reduced by conservation tillage, buffer strips, riparian zones, terracing, contour tillage, and cover crops. Impoundments or small reservoirs can help capture or delay runoff and sediment from manured fields and feedlots.

- **Manage the soil for maximum water infiltration and storage:** maintain crop residues on the soil surface. On

soils that are subject to erosion, use a winter cover crop to reduce erosion and take up nutrients.

- **Maintain vegetation on ditch banks and in drainage channels:** try not to disturb vegetation in drainage channels such as ditches and grassed waterways. Leave a buffer strip along drainage ways.
- **Slow water flow:** use contour tillage, diversions, terraces, sediment ponds, and other methods to slow and trap runoff.
- **Maintain buffer strips:** vegetated buffer strips have been shown effective in trapping nutrients in runoff. Leave buffer areas between farmland and environmentally sensitive areas. The amount of buffer needed varies with the farming activity and the nature of the adjacent area.
- **Do not apply manure on slopes with a grade of more than 15 percent or soils less than 10 inches deep;** do not apply manure on frozen or snow covered ground.

2. Fence animals away from streams, drains, and critical areas

Pastured large animals such as cattle, horses, and sheep randomly deposit manure, making nutrient management more difficult. Livestock should not be allowed free access to streams and ponds to prevent direct deposition of manure into water. Alternative water supplies should be provided by diverting or pumping water to livestock, or restricting the size of the access area. Feed, water, and lounge areas, where animals congregate, should be located so that runoff is filtered through vegetative buffer strips.

Conclusion

In general, animal manure contains more P than crops require if the application rate is based on N needs. Therefore, continuous manure application to meet crop N requirements will result in higher soil test P and water soluble P, and higher potential runoff P. Proper management of P sources and P transport over the landscape can reduce negative impacts of P on water quality.

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U.S. DISTRICT COURT

IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF OKLAHOMA

THE CITY OF TULSA, and THE TULSA METROPOLITAN UTILITY AUTHORITY,
Plaintiffs

Vs.

01-CV-900-EA(C)

TYSON FOODS, INC., COBB-VANTRESS, INC., PETERSON FARMS, INC.,
SIMMONS FOODS, INC., CARGILL, INC., GEORGE'S, INC., and
CITY OF DECATUR, ARKANSAS,
Defendants

POULTRY DEFENDANTS' RESPONSE TO PLAINTIFFS' MOTION AND BRIEF FOR PARTIAL SUMMARY JUDGMENT AGAINST POULTRY DEFENDANTS ON ISSUE OF LIABILITY FOR GROWERS' DISPOSAL OF POULTRY MANURE OR, IN THE ALTERNATIVE, MOTION AND BRIEF TO STRIKE PLAINTIFFS' MOTION AND BRIEF FOR PARTIAL SUMMARY JUDGMENT AGAINST POULTRY DEFENDANTS

Gary V. Weeks
Vince Chadick (OB #15981)
James M. Graves (OB #16604)
BASSETT LAW FIRM
P O. Box 3618
Fayetteville, AR 72702-3618
(479) 521-9996

AND

Richard L. Carpenter, Jr. (OB #1504)
CARPENTER, MASON & McGOWAN
1516 S. Boston Avenue, Suite 205
Tulsa, OK 74119-4013
(918) 584-7400

Attorneys for George's, Inc. and also signing by consent of other Defendants

November 27, 2002

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IN THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF OKLAHOMA

1. THE CITY OF TULSA,
2. THE TULSA METROPOLITAN UTILITY AUTHORITY,

Plaintiffs

v. Case No. 01-CV0900EA(C)

1. TYSON FOODS, INC.,
2. COBB-VANTRESS, INC.,
3. PETERSON FARMS, INC.,
4. SIMMONS FOODS, INC.,
5. CARGILL, INC.,
6. GEORGE'S, INC.,
7. CITY OF DECATUR, ARKANSAS,

Defendants

POULTRY DEFENDANTS' RESPONSE TO PLAINTIFFS' MOTION AND BRIEF FOR PARTIAL SUMMARY JUDGMENT AGAINST POULTRY DEFENDANTS ON ISSUE OF LIABILITY FOR GROWERS' DISPOSAL OF POULTRY MANURE OR, IN THE ALTERNATIVE, MOTION AND BRIEF TO STRIKE PLAINTIFFS' MOTION AND BRIEF FOR PARTIAL SUMMARY JUDGMENT AGAINST POULTRY DEFENDANTS

Come now the Poultry Defendants, and for their Response to Plaintiffs' Motion and Brief for Partial Summary Judgment Against Poultry Defendants on Issue of Liability for Growers' Disposal of Poultry Manure (hereinafter "Plaintiffs' Motion and Brief") and, in the alternative, for their Motion and Brief to Strike Plaintiffs' Motion and Brief, state as follows, to-wit:

GENERAL FACTUAL BACKGROUND

The background and general information regarding the plaintiffs' claims against the Poultry Defendants have been briefed at length by plaintiffs and the Poultry Defendants in their various motions and briefs filed to date. As such, for the purposes of this Response, instead of taking up more of this Court's valuable time reciting

background information already briefed, the Poultry Defendants hereby incorporate by reference the factual background information contained in their Joint Motions filed previously and the background information contained in their Joint Motion for Summary Judgment and Brief in Support.

INTRODUCTION

With regard to their Motion to Strike, plaintiffs' state that when this cause of action was filed on December 10, 2001, plaintiffs' entire theory of the case regarding liability of the Poultry Defendants for the acts of their independent contract growers in the Watershed was that the Poultry Defendants exercised control over their contract growers to such an extent as to negate the contract growers' independent contractor status. (Complaint, ¶¶ 17-22) Plaintiffs continued to assert this single theory of liability for six (6) months, including in their Amended Complaint. (See generally: Amended Complaint) Plaintiffs did not change their theory of liability on this issue nor did they plead the new theories they are now advancing in the instant Motion (e.g. employer is liable for acts of independent contractor that are inherently dangerous, or that the Integrators should be liable since they knew that a trespass or nuisance was likely to result from the Contract Growers' activities) (Amended Complaint, ¶¶ 17-22)

As plaintiffs succinctly state, "[m]uch time and effort has been devoted in discovery to the issue of whether these growers are truly independent contractors, given the degree of control exercised over their operations." (Plaintiffs' Motion and Brief for Partial Summary Judgment, p. 2)(emphasis added) However, now, for the very first time, plaintiffs assert a new and completely different theory of liability. For all of these

reasons, the Poultry Defendants request that the Court Strike the plaintiffs' Motion and Brief, or in the alternative deny the motion.

STATEMENT OF UNDISPUTED FACTS

Plaintiffs submit Thirty-One (31) numbered paragraphs of "facts" which they allege are undisputed. Poultry Defendants dispute the following facts or necessarily complete the facts contained in the plaintiffs' Statement of Undisputed Facts.

1. Poultry Defendants acknowledge that they contract with growers who are independent contractors who raise poultry for the Poultry Defendants. The Poultry Defendants further acknowledge that they deliver baby birds to their contract growers, provide feed and medication for the birds, provide suggestions to improve each contract grower's performance, and pick the birds up prior to processing. Peterson disputes plaintiffs' statement that David Holcombe is a "representative" of Peterson. More correctly stated Mr. Holcombe is an employee of Peterson. (Deposition testimony of Peterson employee and grower, David Holcombe, Exhibit No. 1, p. 3)

2. Poultry Defendants acknowledge that the Poultry Defendants control the genetics and breeding stock of birds placed with their contract growers to attempt to achieve the highest performance for the contract growers and, in turn, improve the end product that each contract grower provides.

3. Poultry Defendants dispute this paragraph because it is argumentative and incorrectly equates manure and litter to be one and the same substance. Plaintiffs mischaracterize the testimony of David Holcombe, Peterson employee and grower, which is that it has generally been the practice in the industry for growers to either sell their chicken litter, give it away or apply it to their own land. Mr. Holcombe did not testify

concerning Peterson's knowledge of this practice or that such practice had been going on since the 1950's. (See: Plaintiffs' Motion and Brief in Support, Exhibit 3; Deposition testimony of Peterson employee and grower David Holcombe, pp. 58-59) Plaintiffs also mischaracterize Ron Mullikin's testimony. Mr. Mullikin, a former Peterson employee, not a "Peterson representative" as plaintiffs' denominate Mr. Mullikin, testified that he could only speculate that growers in the Northeast Oklahoma and Northwest Arkansas area had been land applying chicken litter for as long as they had been growing chickens, and that this could have been done for decades. (See: Plaintiffs' Motion and Brief in Support, Exhibit 5; Deposition testimony of Ron Mullikin, pp. 167-169)

4. Plaintiffs' mischaracterize Schaffer's testimony. The poultry industry has been aware of the environmental impact of nitrogen contained in chicken litter since the late 1980s but did not become aware of the environmental impact of phosphorus or phosphates contained in chicken litter until approximately the mid-1990s. (See: Plaintiffs' Motion and Brief in Support, Exhibit 4; Deposition of Tyson Representative, Archie Schaffer, p. 43, lines 20-25) The Poultry Defendants also dispute this paragraph because it mischaracterizes Mr. Simmons' testimony. The question that was posed to Mr. Simmons was a very broad question and did not contain "environmental impact" as a topic, nor did it contain phosphorus as a topic. The portion of Mr. Simmons' deposition which is attached to Plaintiffs' Motion and Brief in Support as Exhibit 7 reflects the true and correct question and answer exchange.

The Poultry Defendants also dispute this paragraph because the Plaintiffs' statement that the "poultry industry has been aware since at least the late 1980's" of potential environmental risks from the land application of chicken manure is misleading.

Until very recently, the primary concerns of agronomists and the NRCS has been nitrogen, not phosphorus. Agronomists, soil scientists, NRCS in multiple states, and various state agencies are in the process of developing appropriate guidelines for the land application of poultry litter with a present focus on phosphorus. In the past, the focus was primarily on nitrogen. In fact, Plaintiffs' designated expert in the area of soil science, Dr. Jarrell, admits that Nutrient Management Plans in his state are still nitrogen-based. (Deposition of Dr. Jarrell, Exhibit No. 2, pp. 22 – 24, ll. 20-10). Dr. Jarrell further explained that we now have better tools for understanding phosphorus that were not available in the past. (Deposition of Dr. Jarrell, Exhibit No. 2, p. 17, ll. 6-17). Many states are in the process of developing methods to determine appropriate guidelines for the land application of poultry manure. Dr. Jarrell plans to spend another two years to validate the Wisconsin phosphorus index. (Deposition of Dr. Jarrell, Exhibit No. 2, p. 24, ll. 7-10). While there is a recognition that a potential risk may be present, there is no consensus as to when land application of poultry litter actually poses a risk. The Poultry Defendants' expert agronomist, Dr. Tucker, testified that in his fifty years of experience, he has never found a field saturated with phosphorus. There is no data or evidence that fields or pastures with high Soil Test Phosphorus[1] readings cause any harm or loading to waters. (Deposition of Dr. Tucker, Exhibit No. 3, p. 31, and p.36).

Furthermore, Plaintiffs' statement that "the poultry industry is aware" is not supported by the record for purposes of the motion. In support of this contention, Plaintiffs' cite the deposition testimony of a Simmons' representative and a Tysons' representative. Plaintiffs decided to sue six companies that have operations in Northwest

1 As explained in response to Plaintiffs' Motion for Partial Summary judgment on Issue of Liability Under CERCLA, response to Plaintiffs' statement of fact No 18, the topic of "Soil Test Phosphorus" will

Arkansas. However, the poultry industry is certainly much larger than the six Defendants Plaintiffs sued and the two representatives Plaintiffs' cite for purposes of this motion.

5. Plaintiffs' mischaracterize Mr. Schaffer's testimony. His testimony was that the document adopted by Tyson and referred to in this paragraph was used to educate Tyson's contract growers on Best Management Practices in general. (See: Plaintiffs' Motion and Brief in Support, Exhibit 4; Deposition of Tyson Representative, Archie Schaffer, p. 46, lines 12-14) Mr. Schaffer did not state that the document was adopted or otherwise used to educate the growers about potential environmental risks from land application of poultry manure and litter.

6. The Poultry Defendants dispute Plaintiffs' characterization or summary of the seminar materials. The seminar materials (See: Plaintiffs' Motion and Brief, Exhibit 9) are of no less than thirty-five (35) pages and contain numerous findings. Plaintiffs' attempt to distill those reports down to four (4) conclusions which Plaintiffs' believe are beneficial to their arguments herein is improper and inaccurate. The 1994 paper from a research conference is interesting, but does not support any statement of fact material to this Court's ruling. Plaintiffs provide no explanation as to the origin of this document, the nature of the "research conference" from which this document appears to be generated, who was invited to attend the conference and who actually attended. Plaintiffs fail to demonstrate that any representatives of the Poultry Defendants had any knowledge of the "research conference" or this paper. Furthermore, the referenced seminar materials constitute inadmissible hearsay, and accordingly any references to these materials should be stricken as an improper basis for summary judgment.

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be the subject of extensive expert testimony at trial.

In addition, the paper shows that at the time it was published, phosphorus research was still developing. One of the presenters at this "research conference" advised that "soils and management practices that are vulnerable to P (phosphorus) loss, must be identified to implement effective and economically viable management systems that minimize P transport." (See: Plaintiffs' Motion and Brief in Support, Exhibit 9, p. 3) This demonstrates that at the time the paper was published, these management practices were being identified and researched by these scientists. The paper certainly does not go so far as to make specific recommendations relating to the soils in this Watershed. Furthermore, the paper does not demonstrate any type of consensus among the experts as to what might be considered excessive phosphorus levels. This study of phosphorus reactions in the soil and water is still developing and will be the subject of extensive expert testimony at trial.

7. Poultry Defendants dispute the plaintiffs' summary of the Poultry Water Quality Consortium's findings because the plaintiffs ignore significant and relevant aspects of the report. (See: Plaintiffs' Motion and Brief, Exhibit 10) For example, the report recognized that:

> Properly managed poultry wastes from manure, litter, dead birds, and wastewater are profitable farm investments. An effective waste management plan provides for the proper collection, storage, handling, and use of poultry waste. Products produced from wastes reduce chemical fertilizer costs, improve soil quality, and protect water resources, air quality, and human and animal health.

Nonetheless, the referenced third-party materials constitute inadmissible hearsay, and accordingly any references to these materials should be stricken as an improper basis for summary judgment.

8. Plaintiffs mischaracterize the report entitled, "Confined Animal Inventory: Lake Eucha Watershed." (See: Plaintiffs' Motion and Brief, Exhibit 11) The report contains numerous findings, but Plaintiffs' statement of fact attempts to distill the report down to one (1) conclusion. Moreover, plaintiffs use this report as the basis for "undisputed" statements of fact and further rely upon it in their argument, yet the report amounts to hearsay and the calculations contained within it are flawed. The report is flawed because, for example, it states "[o]ur calculations assume that growers are running their houses at maximum capacity, but this is often not the case. Many growers will only raise three or four flocks a year rather than five which is the maximum possible." (See: Plaintiffs' Motion and Brief, Exhibit 11, p. 3) The report should further be excluded from business because it cannot be admitted into evidence in lieu of plaintiffs' experts' own opinions and testimony. This Court should exclude this report in its entirety when viewing this Motion because the plaintiffs are attempting to use it against the Poultry Defendants as if it were an additional expert witness report. However, it is not a report of a designated expert and the Poultry Defendants have not been able to depose the report's author prior to trial and they will not be able to cross-examine the author at trial. As an unsponsored, unsubstantiated, and unreliable expert witness report, it should be excluded in its entirety.

9. For the same reasons set forth in paragraph 8, *supra*, the Poultry Defendants dispute this report and plaintiffs' reliance on it as a basis for "undisputed" facts and argument. (See: Plaintiffs' Motion and Brief, Exhibit 12)

10. Poultry Defendants dispute this paragraph because it omits probative and relevant information contained in the referenced Exhibit. (See: Plaintiffs' Motion and Brief, Exhibit 13) For example, the plaintiffs omit that Mr. Wagner identified wastewater

treatment plants, cattle operations, human waste and background sources as other potential sources of phosphorus. Poultry Defendants further dispute this paragraph with respect to the contributions Mr. Wagner attributes to the Poultry Defendants because those approximations were compiled and supplied by Mr. Wagner who the Poultry Defendants have no control over and whose calculations the Poultry Defendants cannot verify and therefore cannot admit to the them.

11. Poultry Defendants dispute Plaintiffs' characterization or summary of the referenced letter. (See: Plaintiffs' Motion and Brief, Exhibit 14) The letter consists of numerous paragraphs that make multiple points. Plaintiffs' biased summation of the letter in two sentences is improper and inaccurate.

12. Poultry Defendants dispute Plaintiffs' characterization or summary of the letter. (See: Plaintiffs' Motion and Brief, Exhibit 15) The letter contains numerous estimations, calculations and approximations and plaintiffs' attempt to summarize it in only two sentences is improper and inaccurate. Furthermore, the referenced third-party communication constituted inadmissible hearsay, and accordingly any references to this communication should be stricken as an improper basis for summary judgment.

13. Poultry Defendants dispute this paragraph because it is incomplete and an inaccurate representation of the information contained in the memorandum. (See: Plaintiffs' Motion and Brief, Exhibit 16) The quotation provided by plaintiffs is incomplete and is disputed because the plaintiffs omitted five full paragraphs of the memorandum. Plaintiffs' reduction of the memorandum to a meager portion they deem useful is an inaccurate statement of fact. Furthermore, the referenced third-party

communication constituted inadmissible hearsay, and accordingly any references to this communication should be stricken as an improper basis for summary judgment.

14. Poultry Defendants dispute this paragraph because the quotation provided is incomplete and is disputed in the absence of the following information needed to make it complete. (See: Plaintiffs' Motion and Brief, Exhibit No. 17) At the "***" plaintiffs omitted the following:

> The Oklahoma Broiler Council has proposed an eight point plan for a cooperative approach to poultry litter management. The Oklahoma Department of Agriculture has accepted this proposal with some modifications. The ODA is presently writing regulations to put the plan into action. ****

Following the last sentence of the quotation provided by plaintiffs', the plaintiffs' omitted the following:

> If you have applied and are waiting for your plan to be formalized, please continue to use the "Dry Poultry Litter Handling Best Management Guidelines."

15. Poultry Defendants dispute the quoted portion of the letter referred to in plaintiffs' Statement No. 15 because it states in the final paragraph "Please write a letter to Governor Keating as soon as possible and tell him that you are concerned about water quality and the environment . . ." not "water quality in the environment" as stated by plaintiffs. (Plaintiffs' Exhibit 18).

16. Poultry Defendants dispute plaintiffs' biased abstract of the Task Force's Final Report. (See: Plaintiffs' Motion and Brief, Exhibit No. 19) That is a report containing numerous findings, but plaintiffs' attempt to summarize only a portion of it. Furthermore, the referenced third-party communication constituted inadmissible hearsay,

and accordingly any references to this communication should be stricken as an improper basis for summary judgment.

17. Poultry Defendants acknowledge that a meeting occurred on or about December 5, 1997 and that at that meeting plaintiffs' and some of the Poultry Defendants discussed Tulsa's water supply. (See: Plaintiffs' Motion and Brief, Exhibit No. 20) Poultry Defendants dispute this paragraph to the extent that it makes inaccurate representations of the minutes of the recorded minutes of that meeting. Furthermore, the referenced third-party communication constituted inadmissible hearsay, and accordingly any references to this communication should be stricken as an improper basis for summary judgment.

18. Poultry Defendants dispute plaintiffs' characterization and summary of this letter. (See: Plaintiffs' Motion and Brief, Exhibit 21) The letter is a lengthy response to concerns voiced by plaintiffs during their meeting with some of the Poultry Defendants on December 5, 1997. The letter contains a detailed twelve (12) step process responding to plaintiffs' concerns. Plaintiffs' quotation of only one introductory paragraph is improper and inaccurate. Furthermore, the referenced third-party communication constituted inadmissible hearsay, and accordingly any references to this communication should be stricken as an improper basis for summary judgment.

19. Poultry Defendants dispute this paragraph because the information provided in this paragraph is incomplete and is disputed in the absence of noting that after the growers were informed of potential problems with land application of litter, they were encouraged to apply for a Farm Management Plan and encouraged to have soil samples taken before spreading any poultry litter.

20. Tyson Foods admits this paragraph.

21. Poultry Defendants dispute this paragraph because the quotation provided is incomplete and disputed in the absence of the following. (See: Plaintiffs' Motion and Brief, Exhibit 24) At the *** plaintiffs omitted the following brief but important sentence: "Your serviceman can help you with this." The following paragraph was also omitted:

> If you haven't already done so, we strongly urge you to contact your Natural Resources Conservation Service (the old Soil Conservation Office) and request that they help you develop a Nutrient Management Plan. Doing this can help the industry avoid government regulations that could make litter handling even more difficult.

Plaintiffs' biased summarizations of documents and meetings, their quotation out of context of letters, reports, and memoranda, and their deliberate censorship of references that negate their argumentative versions of facts are improper and inaccurate.

22. Poultry Defendants dispute this paragraph because plaintiffs' Statement No 22 is incomplete and misleading. Ron Mullikin, a former Peterson employee, explained at his deposition when questioned about the first sentence quoted by plaintiffs in Statement No. 22, "I think the statement there was one where I didn't feel equipped, didn't feel like I knew enough about everything that was going on to have an opinion about it." (Deposition of Ron Mullikin, Exhibit No. 4, p. 75) Mr. Mullikin testified that he left Peterson in August, 2000, and that he currently is employed by Wal-Mart Mr. Mullikin stated that he had gone to work for Peterson as director of training in November, 1997, and came to have human resources and environmental responsibilities six to nine months later and did not have a background in the poultry industry. (Deposition of Ron Mullikin, Exhibit No. 4, pp. 15, 17-18, 20) In his deposition, Mr. Mullikin stated that the

first meeting that he attended concerning the growing issue of poultry litter and concerns are over problems that it could be creating was in February or March of 1998 with attendees from the States of Oklahoma and Arkansas, the USDA and the University of Oklahoma and OSU. Mr. Mullikin further testified that the ideas and perceptions presented at the meeting no one could really substantiate and what he recalls from the first meeting is almost confusion trying to understand what the problem was, what all the determining factors were and what all the inputs were. (Deposition of Ron Mullikin deposition, Exhibit No. 4, pp. 21-22, 29) A section of the Opinions on the Poultry Litter Issues Memo not quoted in Statement No. 22, states "We are also faced with a lack of science to help us understand where we are, and where we need to go. Agronomists can't agree on the movement of phosphate, the water solubility of the P in the litter, and means of making P more efficient in our feeds. How much P in our soils is too much? Agencies can't agree on max. soil levels. And if they could agree, how would they measure it? In our few check samples, we demonstrated how hard it is to get a good accurate sample." (See: Plaintiffs' Motion and Brief, Exhibit 25).

23. Poultry Defendants dispute this paragraph because plaintiffs' Statement No. 23 again incorrectly refers to Peterson's former employee Ron Mullikin as a "Peterson representative." Statement No. 23 is again incomplete and misleading. The memorandum referred to in Statement No. 23, whose subject is "Spavinaw Watershed Waste Management Plan Meeting," describes a meeting held to help growers in developing their own waste management plan which was sponsored by the NRCS and the Extension Service. (See: Plaintiffs' Motion and Brief, Exhibit 26) Mr. Mullikin in his deposition explained the phosphorus limit of 300 pounds referred to in the memorandum:

"The 300 pounds was an arbitrary number. It was a number that, once again, [was] not based on science. It was a number that someone -- I don't recall if it was the NRCS. I don't recall if it was the extension service, whether it was -- I think in the State of Oklahoma it was mandated by legislation." (Deposition of Ron Mullikin, Exhibit No. 4, , p. 113)

24. Poultry Defendants dispute this paragraph because plaintiffs' Statement No. 24 incorrectly refers to former employee Ron Mullikin as "Peterson's environmental representative." In response to the deposition question posed by plaintiffs' counsel, "Did you come to some belief by the time you left the company as to what portion or percentage of the problem might be caused by the poultry industry?" Mr. Mullikin answered "I believe that there could be phosphate in the lake that came from the soils that had poultry litter applied to them; but to be able to exact those numbers, I wouldn't -- I don't think anybody can." (Emphasis added). (See: Plaintiffs' Motion and Brief, Exhibit 5; Mullikin deposition, pp. 40-41) During plaintiffs' counsel's deposition questioning of Mr. Mullikin concerning a December, 1997 U.S. Senate report concerning the potential for animal waste pollution, the following colloquy occurred:

> **Q.** Would you look at page 4? I think it's the next page maybe, at the bottom talking about environmental impact. They first talk about spills directly into the water have an impact. It goes on to say 'In addition, the excessive growth and decay of algae and other aquatic organisms that feed on excessive nutrients in water deplete dissolved oxygen. The resulting hypoxia (low oxygen) from chronic nutrient enrichment can result in fish kills, odor and overall degradation of water quality'. (Emphasis added). Do you agree with that statement, Mr. Mullikin?
>
> **A.** Based on what I know, yes.
>
> **Q.** Did you know that in February of 1998 when you started this job?
>
> **A.** Yes.

(Deposition of Ron Mullikin, Exhibit No. 4, pp. 68-69) Finally, plaintiffs mischaracterize in misleading fashion, Mr. Mullikin's memo dated November 24, 1998 and deposition testimony concerning this memo. Mr. Mullikin" frustration is not due to lack of action to address the issues as argued by plaintiffs in Statement No. 24, but rather with his inability to find any new solutions to the issues. As he states in his final paragraph of this memo: "I realize once again I've come with no new solutions, but we continue to look at anything that may solve all or part of our problem." (See: Plaintiffs' Motion and Brief, Exhibit 5; Mullikin deposition pp. 142-144 & Exhibit 27, memo dated November 24, 1998)

25. Poultry Defendants dispute this paragraph because plaintiffs misstate and mischaracterize the deposition testimony of David Holcombe in plaintiffs' Statement No. 25. Mr. Holcombe testified that at the 1999 Peterson meeting with growers, there were general comments about the water, the issues that were facing the industry and telling the growers that there were issues out there to be concerned with and to make sure that the growers applied their litter according to their waste management plans. Mr. Holcombe testified that the main part of the discussion was how the growers were going to work with their litter, what the growers did with their litter and how to apply the litter. The growers were told that water quality was an issue that they needed to be concerned about. (See: Plaintiffs' Motion and Brief, Exhibit 3; Holcombe Deposition, pp. 60-62)

26. Poultry Defendants do not dispute that Cargill met with its contract growers on a regular basis to provide education, guidance, and best management practices on waste management and disposal matters.

27. Poultry Defendants dispute this paragraph because it is incomplete. It is incomplete because the plaintiffs omitted the following before the quoted portion provided by the plaintiffs begins:

> It was because we were so involved with the City of Tulsa looking at the lake and quality, and so our first deal was that we can take our litter out.

The plaintiffs also omitted the following, which should be included in the plaintiffs' "quote" following the first ***:

> We did it [because] it was something that we could do. We were trying to identify what we could do to help solve the problem. And so we said we don't have all the answers, but we can take our litter out, and we were trying to educate our growers through meetings. Extension people helped put those meetings on too.

28. Tyson Foods admits this paragraph.

29. Tyson Foods admits this paragraph

30. Poultry Defendants dispute this paragraph because the quotation provided in this paragraph is incomplete and disputed in the absence of the following. At the *** plaintiffs omitted the following portion of the quotation: "[w]e are a little chagrined that we have received no acknowledgement of that effort (much less credit) from the Tulsa World and others, who refuse to accept the fact that there are lots of other contributors of phosphorous to the watershed, in addition to poultry."

31. With respect to Paragraph Thirty-One of the plaintiffs' Statement of Undisputed Facts, the Poultry Defendants dispute this paragraph because the quotation is incomplete and disputed in the absence of the following. At the *** plaintiffs omitted the following portion of the quotation: "[t]he practice of rotating crops and application sites will help remove excess phosphorus. Maintaining soil pH between 6.0 and 7.0, maximizes plant phosphorus uptake, thereby reducing accumulations."

DISCUSSION

PROPOSITION I

THE POULTRY DEFENDANTS ARE NOT LIABLE FOR THE ACTS OF INDEPENDENT CONTRACT GROWERS IN THE WATERSHED BASED ON THEIR NORMAL AND EXPECTED CONTRACT OPERATIONS.

A. Plaintiffs' Legal Authorities Do Not Establish a Basis for the Court to Override the Independent Contractor Status of Contract Growers.

Plaintiffs hope to convince the Court to enforce a limited exception to the general rule that an employer is not liable for the acts of an independent contractor. The caselaw and authorities offered by plaintiffs have little or no persuasive value because they are either wholly irrelevant or factually distinguishable.

In Weinman v. DePalma, 232 U.S. 571 (1914), the United States Supreme Court did identify an exception to the general rule of no liability for the acts of an independent contractor where the "work performed itself" is a nuisance or injures or destroys the property of another. Id. at 576 This statement helped create what is now referred to as the inherently dangerous activity exception to the general rule of no liability.

In attempting to apply the exception of Weinman to the factual circumstances of contract growers, plaintiffs stretch the holding of Weinman beyond the breaking point. The Weinman exception is not, as the plaintiffs would have the Court believe, that the employer is liable if a nuisance is likely to result; instead, the exception states that where the work actually performed is a nuisance or injures or destroys the property of another, the principal can be liable. Here, that is not the case because the work actually performed under the contract (i.e. growing chickens) does not inherently result in any nuisance.

Plaintiffs offer the case of Bleeda v. Hickman-Williams, 205 N.W.2d 85 (Mich. Ct. App. 1973), and a series of similar cases, all of which are factually distinguishable because in none of them is there a bargained for exchange between the employer and the independent contractor whereby the independent contractor gains control of the item or substance that a plaintiff alleges causes the nuisance. Additionally, in none of the cited cases does the alleged nuisance-causing substance have economic value to the independent contractor. In Bleeda, the employer was found liable for acts that occurred while the independent contractor delivered its employer's product to its employer's customers. Bleeda, 205 N.W.2d at 87

Here, that is simply not the case as the alleged nuisance occurs when the contract grower exercises its exclusive ownership and control over litter. It is not until after the contract growers have completed their work (i.e. growing chickens) that the alleged nuisance could potentially arise.

In Bleeda, the employer knew that the process itself caused a nuisance (it created dust and odor), but continued to use the services of the independent contractor to size and screen its coke and ultimately deliver it to the employer's customers (a fact not present herein). Here, the Poultry Defendants contract with their contract growers to raise chickens, and the contract growers are the contractual owners of litter. It is not until the grower asserts control over the litter that the alleged nuisance can arise. It is not the work contracted to be performed that creates the alleged nuisance; it is a separate and distinct act that creates the alleged nuisance.

In McQuilken v. A&R Dev. Corp., 576 F.Supp. 1023 (E.D. Penn. 1983), the court found that the employer of an independent contractor can be liable when the contractor is

employed to do work that the employer knows or has reason to "recognize that, in the ordinary course of doing the work ... the trespass or nuisance is likely to result." McQuilken, 576 F.Supp. at 1033; quoting RESTATEMENT (SECOND) OF TORTS § 427B (Plaintiffs' Motion and Brief, p. 21) Here, in the ordinary course of contracting with independent growers to raise chickens, there is no way for the Poultry Defendants to know or have reason to know that a nuisance or trespass will occur. As acknowledged, poultry litter has long been recognized as a valuable soil supplement for agronomic uses, which the contract growers are free to use as permitted by their nutrient management plans, or to sell for the use by others. Again, the Poultry Defendants have a right to assume that under the contract that the grower will make use of the litter in a manner consistent with applicable law.

Plaintiffs rely on Amoco Pipeline Co. v. Herman Drainage Sys., Inc., 212 F.Supp.2d 710 (W.D. Mich. 2002)(Plaintiffs' Motion and Brief, p. 17), as a basis for ignoring independent contractor status. Because the Amoco case involves the "abnormally dangerous activities" exception, it has little relevance to the matter at hand, as it has not been pled by plaintiffs that either the raising of poultry or the application of litter is inherently dangerous. In Amoco, an employer / farmer employed an independent contractor to excavate a site on his farm. The farmer had actual knowledge of a petrochemical pipeline that cut through the farm his property near the location of the excavation but failed to inform the independent contractor of the existence of the pipeline. The Poultry Defendants cannot be aware of this type of special risk or abnormally dangerous activity because one simply is not present and as such this case has

little if any precedental persuasive value to the matter at hand, and thus the case does not support the plaintiffs' contention.

Another case of plaintiffs' involving the "inherently dangerous activities" exception is U.S. v. Aceto Agr. Chem. Corp., 699 F.Supp. 1384 (S.D. Iowa). (Plaintiffs' Motion and Brief in Support, p. 18) The Aceto case addresses the manufacture and disposal of pesticides and pesticide by-products and whether an employer arranged for the disposal of hazardous waste by-products under the guise of the contract. Aceto, 699 F.Supp. at 1387, 1389 The Aceto case concerned the disposal of a substance listed as hazardous under CERCLA. Conveniently, via their Motion in Limine, the plaintiffs are attempting to prevent the Poultry Defendants from showing a jury that litter is not classified as hazardous under any regulatory scheme. At any rate, because litter is not hazardous under CERCLA and is in no way abnormally dangerous, the cited case is absolutely irrelevant to the case at bar.

The court in Shannon v. Mo. Valley Limestone Co., 122 N.W.2d 278 (Iowa 1963), recognized that an employer of independent contractors has a duty to suppress a nuisance created by its independent contractors where the work being performed is the cause of the nuisance. Id. at 280 (Plaintiffs' Motion and Brief, p. 18) This proposition is also found in the case of Peairs v. Fla. Publ'g Co., 132 So.2d 561 (Fla. Ct. App. 1961) where the court stated where an employer gains knowledge of a "dangerous situation," it may be liable if it fails to halt or correct the situation. Peairs, 132 So.2d at 565 (Plaintiffs' Motion and Brief, p. 20) Herein, even if the work performed (growing chickens) did cause the alleged nuisance, which it does not, the work did not create the alleged nuisance in all situations. In fact, many of the farmers in the Watershed transport their

litter out of the Watershed and thus cannot contribute even theoretically to the alleged nuisance. Furthermore, there is a marketplace for poultry litter, whereby third parties buy the litter for their own uses, both within and without the Watershed, all of which is clearly outside the control of the Poultry Defendants. The alleged nuisance complained of by the plaintiffs does not amount to a "dangerous situation" or abnormally dangerous activity – in fact, plaintiffs' own experts will testify that the phosphorus from any one area receiving litter in and of itself is most likely not damaging to the environment, but is only damaging if it reaches certain concentrated levels in a given geographical area in the aggregate from all sources. Thus, poultry litter is not inherently or abnormally dangerous or a nuisance in and of itself.

Moreover, even if an alleged nuisance or dangerous situation did arise in every situation, which it does not, when the Poultry Defendants became aware of concerns regarding phosphorus in the Watershed, they implemented Best Management Practices and other measures to abate prospective or alleged nuisances, despite the fact that the alleged nuisance (i.e. all phosphorus from all sources aggregated in the watershed) was not created by the Poultry Defendants' conduct. If anything, the Poultry Defendants acted voluntarily to help educate the contract growers on litter management, and they cannot be held liable under the cases presented by plaintiffs because, in all of those cases, plaintiffs rely upon an employer's failure to act to abate or control the nuisance created by the acts of its contractors.

After touching upon the law of numerous and non-controlling jurisdictions, plaintiffs finally address Oklahoma law in one paragraph on pages 21-22 of their Motion and Brief. In 1925, the Oklahoma Supreme Court found that an employer is subject to

liability where actions in conformance with the ordinary performance of a contract necessarily or naturally result in a nuisance. Tankersly v. Webster, 243 P.2d 745, 747 (Okla. 1925)(Plaintiffs' Motion and Brief, p. 21) This case is also without precedental value as the Tankersly court noted that the rule plaintiffs urge on this Court did not even apply in that case. Plaintiffs have failed to produce any Oklahoma case that applies the rule mentioned in Tankersly. Moreover, the Tankersly is further inapplicable because it, too, involved an abnormally dangerous situation, not an alleged nuisance or trespass.

For numerous reasons the plaintiffs' argument that this exception applies is misplaced. Case law and facts at hand demonstrate the following:

> 1. No Oklahoma case has applied the exception in the manner in which plaintiffs' urge on this Court. The only case from Oklahoma that plaintiffs' cite for a similar proposition is almost eighty years old, does not apply factually, and does not adopt the rule plaintiffs seek to impose upon the Poultry Defendants.
>
> 2. The Poultry Defendants were not aware until the 1990's that phosphorus presented potential problems to the Watershed; the Poultry Defendants then began implementation of measures to educate their contract growers about litter management issues and to prevent and abate phosphorus concerns. Even, plaintiffs admit that it was not until 1996 or 1997 that the Poultry Defendants became aware of potential problems presented by phosphorus. (Plaintiffs' Motion and Brief, p. 22) Plaintiffs' repeated and unfounded allegations that Poultry Defendants have known for decades about this problem are both erroneous and irrelevant, as they are only red herrings put forth to confuse the issue.
>
> 3. The Poultry Defendants have taken tangible, reasonable steps to restrict the amounts of phosphorus generated in the Watershed through land application operations within the limits allowed by their contracts with their growers. The fact of the matter is that the plaintiffs are so fixated on poultry operations that they will only be satisfied with the total cessation of all poultry operations in

> the Watershed, an action that would not help the Water Supply in the short term, but would certainly be economically devastating to numerous independent contract growers who are not before this Court.

These facts in no way trigger the exception with which plaintiffs proselytize the Court. For all of these reasons, this Court should decline to apply the plaintiffs' proposed exception and, accordingly, the Court should deny the plaintiffs' Motion for Partial Summary Judgment on this issue.

PROPOSITION II

LAND APPLICATION OF LITTER DOES NOT CONSTITUTE A NUISANCE *PER SE*.

A. Plaintiffs' Legal Authorities Do Not Establish a Basis for the Court to Find as a Matter of Law that Land Application of Poultry Litter is a Nuisance *Per Se*.

1. Caselaw cited by plaintiffs does not establish that poultry litter is a nuisance *per se*.

Throughout their pleadings plaintiffs continually refer to manure and litter interchangeably as if they are the same substance, when that simply is not the case. However, because litter is a combination of manure and rice hulls or wood chips on an approximately 50-50 ratio, the two substances are quite distinct. Plaintiffs continuing referral to the substances as being equal is merely inflammatory, and erroneous.

Plaintiffs' cite three (3) cases for the proposition that animal manure (not poultry litter) has been found to be a pollutant. (Plaintiffs' Motion and Brief, p. 23) Those cases are: Concerned Area Residents for the Env't v. Southview Farm, 834 F.Supp. 1410 (W.D.N.Y. 1993)("CARE") reversed 34 F.3d 114; Carr v. Alta Verde Indus. Inc., 931 F.2d 1055 (5th Cir. 1991)(NPDES permit case); and, Higbee v. Starr, 598 F.Supp. 323 (E.D. Ark. 1984). However, CARE and Higbee are the only cases even remotely on

point regarding manure (not litter) as a pollutant. In each of these cases, the issue is the classification of liquid (not solid) swine waste that falls directly from swine contained in a Confined Animal Feeding Operation through floor "slats" and into holding lagoons without being mixed with any substance (e.g. rice hulls or shavings) to begin breaking down and diluting the nutrients contained in the waste. In each of the cases relied upon by plaintiffs for this proposition, the manure was not a solid, and was not mixed with any other substance to reduce or change its composition, making it potentially more susceptible to runoff. Here, plaintiffs are attempting to have litter equated to liquefied swine manure and/or attempt to treat litter the same as manure under the Clean Water Act and the cases cited in their Brief, which is simply not the case and is merely an effort to mislead the Court by clouding the issue with irrelevant comparisons. The two substances differ to such a fundamental extent that they cannot be considered equivalents for purposes of rhetoric or for application of case law.

2. Oklahoma Statutes cited by plaintiffs do not establish that poultry litter is a nuisance *per se*.

Plaintiffs' hope to convince the Court to trigger the public nuisance provisions of Oklahoma law based on invocations of statutory definitions which include manure (not poultry litter) as a pollutant. Plaintiffs' attempt is misplaced.

First, Title 27A, Section 2-6-105, in addition to the terms relied upon by the plaintiffs, further requires that where the Executive Director finds that water has been polluted he should order the pollution to cease or order actions intended to prevent the pollution in the future. 27A O.S. §2-6-105(B) In this matter the Executive Director has not made any such finding or order.

Moreover, as acknowledged by the plaintiffs, there is no conflict between section 27A and the general public nuisance law found in Title 50 of the *Oklahoma Statutes*. (Plaintiffs' Motion and Brief in Support, p. 25) Section 1.1 of Title 50 provides:

> Agricultural activities conducted on farm or ranch land, if consistent with good agricultural practices and established prior to nearby nonagricultural activities, are presumed to be reasonable and do not constitute a nuisance unless the activity has a substantial adverse affect on the public health and safety.

50 O.S. §1.1(B)

Here, the actions plaintiffs complain of do not constitute a nuisance. To date, it has not been established that the manner in which the contract growers handle their litter has (beyond mere allegations) a substantial adverse affect on public health or safety. As such, litter application in the Watershed and the alleged consequences of that application by the contract growers is reasonable and does not amount to a nuisance *per se*. Because the Poultry Defendants have not allowed manure to enter waters of the State of Oklahoma and because litter application practices of contract growers have always been consistent with good agricultural practices, land application of litter is not a nuisance *per se*.

PROPOSITION III

PLAINTIFFS HAVE FAILED TO SHOW THAT THE POULTRY DEFENDANTS ARE LIABLE AS A MATTER OF LAW FOR VIOLATING STATUTES REGARDING THE POLLUTION OF A MUNICIPAL WATER SUPPLY.

Plaintiffs failed to show that the Poultry Defendants are liable under the "normal and expected contract operations" exception to the general rule that there is no liability for an employer of an independent contractor, or that the "abnormally dangerous activities" exception applies. Plaintiffs have failed to show that litter (not manure) is

considered by any of the authorities (e.g. CWA, RCRA, case law, and/or statutes) to be a pollutant or otherwise considered to be a hazardous substance. Plaintiffs have also failed to show that the agriculture practices engaged in by the contract growers in the Watershed are not consistent with good agricultural practices. As such, plaintiffs' failed to show that there is no genuine issue regarding each of those facts and, accordingly, they are not entitled to judgment as a matter of law as to any of them.

POULTRY DEFENDANTS' MOTION TO STRIKE

Alternatively to denying Plaintiffs' Motion and Brief, the Poultry Defendants assert that because the plaintiffs have not raised this theory of the case at any time prior to this Motion, this Motion should, in the interest of not rewarding unfair surprise and in the interests of fair play and substantial justice, be stricken in its entirety.

Rule 12(f) of the Federal Rules of Civil Procedure states in pertinent part as follows:

> (f) Motion to Strike. Upon motion made by a party before responding to a pleading or ... upon the court's own initiative at any time, the court may order stricken from any pleading any insufficient defense or any redundant, immaterial, impertinent, or scandalous matter. Fed. R. Civ. P. 12(f) (Supp. 2000)(emphasis added).

Rule 12(f) provides a court the impetus to strike, either by its own initiative or upon proper motion, redundant, immaterial, impertinent, or scandalous information contained in any pleading or to strike the pleading in its entirety. A Rule 12(f) Motion does not challenge the pleading on its face, but merely challenges the timeliness, relevance and / or materiality of information contained in the pleading. The motion may be used to strike allegations or information in the pleading that do not help understand the plaintiff's claim for relief and/ or do not perform some other useful purpose in promoting the just disposition of the litigation.

See Wright & Miller "Federal Practice & Procedure" § 1380-1382. In addition, Rule 12(f) motions are used to challenge allegations and information contained in the pleading that are unworthy of consideration by the court because they are so unrelated to the plaintiff's cause of action that it would be unnecessary, burdensome, or unjust to require a defendant to respond.

Via their Motion and Brief, plaintiffs for the very first time, just two months out from trial, present a radically different theory of the case from that which they have relied on or disclosed to date. Until the plaintiffs filed their Motion and Brief they have relied solely upon their contention that the Poultry Defendants exercise so much control over their contract growers that the contract growers are not actually independent contractors but are agents of the Poultry Defendants. This assertion was the basis of their theory of liability in their original Complaint and in their Amended Complaint. (See generally: Complaint, ¶¶ 17-22 & Amended Complaint, ¶¶ 17-22)

Now, apparently recognizing flaws in their argument, plaintiffs attempt to change course and assert a new and dramatically different theory of liability. They did not choose to assert this theory of liability until they filed the instant Motion, after depositions and discovery were completed or near completion, and thus the theory has not been investigated during the discovery process. If plaintiffs had disclosed this theory of liability at an earlier juncture then it would have drastically altered the Poultry Defendants discovery process, theories of the case, and defense strategy. Additionally, plaintiffs' new theory would have required additional discovery regarding the scientific aspects of the argument and the validity inquiries into the remote authorities relied upon by the plaintiffs regarding their argument.

In short, plaintiffs ambushed the Poultry Defendants with a new theory of liability that Poultry Defendants cannot properly defend against because discovery is closed. For these reasons, the Poultry Defendants request that this Court strike plaintiffs' Motion and Brief pursuant to Rule 12(f) of the *Federal Rules of Civil Procedure*.

CONCLUSION

Plaintiffs have failed to show that there is an absence of material fact with regard to the alleged liability of the Poultry Defendants. Plaintiffs did not establish the normal and expected contract operations exception to the general rule that there is no liability for the acts of independent contractors. Plaintiffs failed to prove that litter (not manure) is a pollutant or hazardous material, beyond mere broad allegations. As such, the Poultry Defendants are not liable as a matter of law under any of the theories presented by the plaintiffs in their Motion and Brief. In the alternative, because the theory of recovery presented by the plaintiffs is radically different than any theory asserted to date, the Poultry Defendants request that the Court strike plaintiffs' Motion and Brief in its entirety.

WHEREFORE, PREMISES CONSIDERED, the Poultry Defendants respectfully request that this Court deny Plaintiffs' Motion and Brief for Partial Summary Judgment Against Poultry Defendants on Issue of Liability for Growers' Disposal of Poultry Manure or, in the alternative, that the Court will grant the Poultry Defendants' Motion to Strike Plaintiffs' Motion and Brief for Partial Summary Judgment Against Poultry Defendants on Issue of Liability for Growers' Disposal of Poultry Manure, and they further request any and all other relief to which they may be entitled.

By:

Gary V. Weeks
Vince Chadick (OB #15981)
James M. Graves (OB #16604)
BASSETT LAW FIRM
P.O. Box 3618
Fayetteville, AR 72702-3618
(479) 521-9996

AND

Richard Carpenter

Richard L. Carpenter, Jr. (OB #1504)
CARPENTER, MASON & McGOWAN
1516 S. Boston Avenue, Suite 205
Tulsa, OK 74119-4013
(918) 584-7400

Attorneys for George's, Inc. and also signing by consent of other Defendants

CERTIFICATE OF SERVICE

This is to certify that I have on this day served counsel for all parties in the foregoing matter with a true and correct copy of this pleading by depositing in the United States mail a copy properly addressed with adequate postage thereon.

DATED this 27th day of November, 2002.

Richard L. Carpenter, Jr.

0001

IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF OKLAHOMA

. THE CITY OF TULSA 2. THE TULSA METROPOLITAN UTILITY AUTHORITY, Plaintiffs, vs. 1. TYSON FOODS, INC., 2. COBB-VANTRESS, INC., 3. PETERSON FARMS, INC., 4. SIMMONS FOODS, INC., 5. CARGILL, INC., 6. GEORGE'S, INC., 7. CITY OF DECATUR, ARKANSAS, Defendants.	Case No. 01 CV 0900B(X)

DEPOSITION OF DAVID LEE HOLCOMBE
Taken at 221 North College, Fayetteville, Arkansas,
on August 8, 2002, at 9:00 a.m.

0002

APPEARANCES

MR. ROBERT L. ROARK McKinney & Stringer Corporate Tower 101 North Robinson, Suite 1300 Oklahoma City, Oklahoma 73102 (405) 272-1901 (405) 239-7902 Fax	FOR THE PLAINTIFFS
MR. A. SCOTT McDANIEL Joyce, Paul & McDaniel, P.C. 111 West Fifth Street, Suite 500 Tulsa, Oklahoma 74103 (918) 599-0700 (918) 732-5370 Fax	FOR THE DEFENDANT, PETERSON FARMS, INC.
MS. THERESA NOBLE HILL Rhodes, Hieronymus, Jones, Tucker & Gable, P.L.L.C. 100 West Fifth Street, Suite 400 Tulsa, Oklahoma 74103-4287 (918) 582-1173 (918) 592-3390 Fax	FOR THE DEFENDANT, CARGILL, INC.
MS. LINDA C. MARTIN Doerner, Saunders, Daniel & Anderson	FOR THE CITY OF DECATUR, ARKANSAS

EXHIBIT
1

22 A. Tuesday.
23 Q. Okay, sir.
24 A. Last Tuesday.
25 Q. About how long did you spend there?
0005
1 A. Probably two hours.
2 Q. Who all was present besides Mr. McDaniel?
3 A. Janet Wilkerson.
4 Q. Anyone else?
5 A. No.
6 Q. Okay. Are you employed by Peterson in any respect?
7 A. On a limited part-time basis.
8 Q. And what is your title or -- Tell me about that
9 part-time basis.
10 A. The title is probably somewhat misleading. I was
11 hired beginning of February, like I say, on a limited
12 part-time bases mainly to deal with water quality issues
13 and environmental issues that -- and attend meetings that
14 were having effect with the poultry industry for Peterson
15 Farms.
16 Q. So you are an employee of Peterson's?
17 A. Part-time.
18 Q. How many -- Do you have regular hours?
19 A. No, sir.
20 Q. How many hours a week do you work in that capacity?
21 A. Without going back and looking at the records, I
22 doubt that I have worked a total of ten hours a month.
23 Like I say, it's very limited.
24 Q. Who do you report to in that capacity?
25 A. Would be Janet Wilkerson.
0006
1 Q. And was this a job that was filled by someone else,
2 to your understanding, before you were hired part-time?
3 A. No, sir, not to my understanding.
4 Q. Is this a -- a position that was created more or
5 less when -- when they hired you?
6 A. Yes.
7 Q. And does it have an official title or name?
8 A. I think they've got it listed as environmental
9 employee, I believe is the way it's listed. Environmental
10 issues maybe.
11 Q. Okay, sir. And what is your compensation
12 arrangement for that job?
13 A. It's an hourly fee.
14 Q. And what is that?
15 A. $20 an hour.
16 Q. When you were hired, what were your -- how were your
17 duties explained to you?
18 A. What we had discussed was that as water quality
19 issues came up, as meetings came up pertaining to water
20 quality or environmental issues, I would probably attend
21 those meetings and bring that information back to the
22 company and dispense that information to them. Usually
23 that came back to Janet, and then they would take that
24 information and do whatever they needed to, you know, and
25 make their decisions with it.
0007
1 Q. And is your job limited solely to meeting with
2 out -- in outside meetings or conferences or wherever
3 water quality issues are the subject?
4 A. That's the basics, yes. There will be some meetings
5 that take place there at the office, but the majority of
6 it has been travel meetings.

COPY OF TRANSCRIPT

IN THE UNITED STATES DISTRICT COURT FOR THE

NORTHERN DISTRICT OF OKLAHOMA

THE CITY OF TULSA AND TULSA METROPOLITAN UTILITY AUTHORITY,	)	
Plaintiff,	)	
vs.	)	No. 01CV0900B(C)
PETERSON FARMS, INC.; TYSON FOODS, INC.; GEORGE'S, INC.,; COBB-VANTRESS, INC.; CARGILL, INC.; SIMMONS FOODS, INC.; CITY OF DECATUR, ARKANSAS,	)	
Defendants.	)	

DEPOSITION OF WESLEY M. JARRELL

TAKEN ON BEHALF OF THE DEFENDANTS

ON NOVEMBER 5, 2002, BEGINNING AT 8:40 A.M.

IN TULSA, OKLAHOMA

APPEARANCES:

MR. KENNETH N. McKINNEY, Attorney at law, of The firm McKINNEY & STRINGER, 101 North Robinson, Suite 1300, Oklahoma City, Oklahoma 73102, appeared for the **PLAINTIFF.**

MR. JOHN ELROD, Attorney at Law, of the CONNER & WINTERS firm, Suite 200, 100 West Center Street, Fayetteville, Arkansas 72701-6081, appeared for the **DEFENDANT SIMMONS FOODS.**

REPORTED BY: **KATHERINE A. POWELL, CSR, RPR, CRR**

EXHIBIT 2

Then wl. n I went to Riverside in 6, they were in the middle of nitrate work down there. They were early, but then phosphorous faded out in the late '70s, nitrate came in and has been a fairly dominant issue for some time.

Now there's a realization, and I think in part it's because we have better tools for understanding phosphorous than we ever had in the earlier days.

Q What has happened in science that has given us better tools to understand phosphorous?

A Well, the way we've looked at it, at least in our program, is geographic information systems, for example, GIS lets you look at the whole landscape, understand elements of it like slope, land management, soil type, where the water is, how much is coming out.

Computer modeling has certainly been an element that's something that wasn't particularly available 20 years ago, 30 years ago.

Q From your viewpoint, Dr. Jarrell, in the last 20 years has there been a particular scientist who has been a crusader for phosphorous?

A Well, the name that pops up all the time is Sharpley.

number of those who will go into cash grains.

And a lot of those farmers value the nitrogen material and the phosphorous and the organic matter that they're getting out of the manure.

Q There's been a lot of talk in Oklahoma and Arkansas about something called a litter bank, which is nothing more than an informatio system for potential buyers and so on for chicke litter can come together, for instance. Is the sa sort of thing going on in Wisconsin in terms of dairy manure?

A That's a great idea. I haven't seen that level of development yet. My wife is actually working on some approaches that are similar to that in trying to get people who produce organic waste materials of all kinds to join together and try to create value-added products that are real beneficial.

Q Is there an equivalent of a phosphorou index in the Wisconsin regulatory scheme?

A Right. The 590 standard has a phosphorous index.

Q And that's actually in play right now in Wisconsin?

A It's not -- when the 590 standard becomes in effect, it will be in play. But that's -- initially, it was anticipated it would be this year, but it looks like it's pushed forward a couple of years.

Q Are there any other standards, other than a phosphorous index, that would tell a farmer whether or not he or she can apply animal manure to a particular field?

A Right. The way the 590 was written this round, it also includes a soil test phosphorous option.

Q Is that in play yet?

A No. Neither one are because the 590 isn't.

Q So right now it's totally laissez-faire?

A It is. It is. Yeah, as far as I'm aware, it's nitrogen-based still, which is the old standard.

Q But there is, then, some regulation that could prohibit a farmer from applying to a particular field animal manure?

A If -- when the 590 standard, if it gets inserted into the Department of Ag regulation, it would be.

Q So it's still something yet to come?

A That's correct. But there's an anticipa
date that looks relatively firm. The 590 was in
process when the last set of rules went through,
so it wasn't yet finalized. And they were not --
did not want, for good reason, to accept somethi
that wasn't finalized as the standard.

So our ideal is to work the next two year
very hard to get the phosphorous index more
validated over a wide range of areas and tested t
determine if it's doing its job.

Q Is there general acceptance among the
agricultural community that it is time to start
dealing with these kinds of issues?

A I would characterize it as reluctant
acceptance in many cases.

Q That's a good term. I like that.

A It's not embraced fully, but there's a
realization that it's coming and that the best wa
to deal with it -- and that's what Discovery Farm
are trying to do, I think, is to get out ahead of it
and be able to say this is what is happening on
the farm and this is what's happening with the
environment, and these are the benefits and cost
of the BMP's, for example, that you're asking us t
do, or sometimes telling us to do.

1 IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OKLAHOMA
2
3 THE CITY OF TULSA, and THE)
TULSA METROPOLITAN UTILITY)
4 AUTHORITY,)
Plaintiffs,)
5)
vs.) Case No. 01-CV-0900-B(C)
6)
)
7 TYSON FOODS, INC.,)
COBB-VANTRESS, INC., PETERSON)
8 FARMS, INC., SIMMONS FOODS, INC.,)
CARGILL, INC., GEORGE'S INC.,)
9 and THE CITY OF DECATUR, ARKANSAS,)
)
10 Defendants.)

11
12
THE DEPOSITION OF BILLY B. TUCKER, Ph.D.,
13
taken on behalf of the Plaintiffs, pursuant to
14
agreement of the parties, on the 14th day of November
15
2002 at the law offices of Rhodes, Hieronymus, Jones,
16
Tucker & Gable, 400 ONEOK Plaza, Tulsa,
17
Oklahoma, 74103, before Elizabeth Roy Rockett,
18
Certified Shorthand Reporter in and for the States of
19
Oklahoma and New York.
20
21 A p p e a r a n c e s
22
For the Plaintiffs: MR. KENNETH N. MC KINNEY, ESQ.
23 MR. ROBERT L. ROARK, ESQ.
McKinney & Stringer
24 Suite 1300
101 North Robinson
25 Oklahoma City, Oklah

EXHIBIT
3

of crops and it ought to be recycled and used.
Q. In a form that doesn't hurt water supplies?
A. Yes.
Q. Do you, even though you would say it differently, can you see that this is a statement that a competent scientist could make?
A. They did.
Q. The next paragraph starts out saying, "Several states have proposed standards that would limit manure application..." and so forth. It goes on to say standards may be based on nutrient utilization where manure is applied to meet phosphorus required for crop production. First, do you think that's accurate and correct?
A. Yes.
Q. It goes on to say, "Standards based on waste disposal exceed nutrient phosphorus crop requirement and allow for some buildup of soil phosphorus. Do you think that's correct?
A. I really don't understand the sentence standards based upon waste disposal exceed nutrient P crop requirement or the standards do allow for some buildup of soil. That's correct.
Q. If an application is in excess of plant needs, then it's being called here a waste disposal rather than a beneficial use?

A. Runoff from water?
Q. Runoff water, yes.
A. You can get runoff from water, but I don't think you carry the material. It's all the way to the creek.
Q. You don't?
A. Not generally.
Q. Let's say people think the weather is going to be nice and dry. You see how they spread this dusty, dry chicken manure on the field, haven't you?
A. Yes.
Q. You just take a truck and kind of spread it around. You've seen it blow around and everything else when they're applying it; does it not?
A. I haven't seen it -- I have seen it, you know, the dust blow out from it. But the manure itself dropped to the ground when I saw it.
Q. So if the weatherman happens to be wrong that week and a few days later if there's a pretty good rainfall, then why is it that the runoff is not going to carry with it some of that soluble feed that's been put right on top of the soil?
A. Over the soluble P?
Q. Yes, sir.
A. I thought you were talking about the P in the --
Q. The high STP in, down in the soil itself?

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OKLAHOMA

THE CITY OF TULSA, THE TULSA METROPOLITAN UTILITY AUTHORITY, Plaintiffs,	No. 01 CV 0900B(X)
vs.	VIDEOTAPED DEPOSITION OF RONALD J. MULLIKIN
TYSON FOODS, INC., COBB-VANTRESS, INC., PETERSON FARMS, INC., SIMMONS FOODS, INC., CARGILL, INC., GEORGE'S, INC., CITY OF DECATUR, ARKANSAS, Defendants.	

COPY

THE VIDEOTAPED DEPOSITION OF RONALD J. MULLIKIN, taken before Karen J. Eichmann, Certified Shorthand Reporter and Notary Public of the State of Iowa, commencing at 12:02 p.m., on the 18th day of July, 2002, at 421 West Broadway, Suite 405, Council Bluffs, Iowa.

Reported by: Karen J. Eichmann, C.S.R.

EXHIBIT 4

1 regional sales manager.
2 Q. Where was your store as assistant
3 manager?
4 A. I was in Cross Lanes, West Virginia;
5 Freehold, New Jersey; Waterloo, Iowa.
6 Q. Then why did you leave them and go to
7 Peterson?
8 A. Well, I left them for health reasons
9 and because I wanted to live back in northwest
10 Iowa. I didn't leave -- or northwest Arkansas.
11 I didn't leave them because I wanted to go to
12 work for Peterson. I left them really without
13 having another job to go to and just took a
14 short sabbatical and then found the position at
15 Peterson.
16 Q. And started with Peterson when?
17 A. I believe it was in November of I
18 believe it was '97.
19 Q. And when did you leave Peterson?
20 A. Would have been in August of 2000, and
21 I think those dates are close.
22 Q. Then you left Peterson and went back
23 with Wal-Mart.
24 A. That's correct.
25 Q. What's the reason that you left

of the divisions to the other.

Q. And you anticipate your position back in the home office will be what?

A. Most likely with Sam's Club. There's a couple of different things that we are negotiating on right now. I don't know exactly which position it will be that they finally put me in.

Q. So you can't tell me what your function will be then?

A. No.

Q. How would you rate your tenure with Peterson Farms as far as job satisfaction and things of that sort?

A. I enjoyed it. I especially enjoyed the environmental side of it, and I think it's because of my agricultural roots. Enjoyed the human resources part of it also. And the part that I was originally hired for, which was to be the director of training, I got to the point where we had people trained that did most of that; and I wasn't nearly as involved with it.

Q. So after that point you moved more into the environmental side?

A. Uh-huh.

Q. Did you actually pick up an environmental title at that point?

A. I had the title of director of environmental affairs.

Q. From inception or later on?

A. No, later on.

Q. So at first director of training?

A. Uh-huh.

Q. And then after how long?

A. I would have said that it would be probably six to nine months.

Q. So sometime you are thinking in mid or so 1998, you're named director of environmental affairs, did you say?

A. That became -- that became more of what I did. My involvement with the environment started out with being asked to simply attend a meeting and come back and report on what my feelings were. As I gained a better understanding of it and I think their comfort level with what I was doing and seeing grew, that is when they said to go ahead and dedicate more time to that.

Q. Was there a function in the company with that title before?

area once you took over?

A. Uh-huh.

Q. Did those people report to you for environmental issues?

A. No. On many occasions I went to them for help just because I don't have a background in the poultry industry.

Q. But you did coordinate and work together with them after you became the director?

A. Yes.

Q. How would you describe Peterson Farms insofar as a commitment to environmental issues?

A. I would say that it was a huge concern.

Q. From the first when you became familiar with it?

A. I would have to say so or they wouldn't have put me in that position and started sending me to those meetings.

Q. What was the first meeting that you went to that you said sort of led to this assignment?

A. It was a meeting, and I don't recall the date, but it was a meeting at John Brown University. No, I take it back. It was at

Simmons Foods that we attended in Siloam Springs.

Q. A meeting at the Simmons Food facility?

A. Uh-huh, with integrators. There were people there from the state of Arkansas. There were people there from the USDA, people from Oklahoma, people from the University of Oklahoma, OU.

Q. OSU?

A. Yes.

Q. Are you saying both OU and OSU?

A. Yes.

Q. Approximately when was that meeting?

A. I would have to -- and this is a guess. Let's say that it was probably in February or March of '98.

Q. Three or four months after you had been with the company?

A. Uh-huh.

Q. What was your understanding of the purpose of the meeting?

A. Was to discuss the growing issue of poultry litter and concerns over problems that it could be creating.

Q. Primarily problems in watersheds?

A. Uh-huh.

Q. And was the Spavinaw watershed one of those areas that was being discussed?

A. I don't recall it being talked about specifically. There were a number of watersheds and a number of things that were discussed, and I don't -- I don't recall the total content of the meeting.

Q. What did you bring away from that meeting? What kind of knowledge or feeling about this area?

A. Mr. McKinney, my first feeling, if I remember correctly, was one of confusion because the ideas the people had, the perceptions is probably the best way to put it, no one could really substantiate. There was nothing really clear and decisive about what everybody was talking about.

Through my years in the fertilizer business, my understanding the properties and the way that phosphate, for instance, acts and reacts in the soil was somewhat different than what I was hearing at those meetings.

Q. What had been your understanding and --

again.

Q. What typ of soil would be able to sustain that type of phosphorus load?

A. I couldn't tell you.

Q. What impressions did you come out of this initial meeting at Simmons Foods with?

MS. BARTLEY: Object to form.

A. What I recall, once again, from that first meeting is one of almost confusion trying to understand what the problem was, what all the determining factors, what all the inputs were. And then I recall sitting down with Janet Wilkerson and us talking about what our role was or might be in the issues that were being spoken about.

Q. And Ms. Wilkerson's role was what, her function?

A. She was the vice president that I answered to. She was my direct report.

Q. What was her title? Vice president?

A. She was vice president of human resources.

Q. And in your training function, you had been reporting to her?

A. That's correct.

1 annual litter from a typical broiler house of
2 22,000 birds contains as much phosphorus as is
3 in the sewage from a community of 6,000 people."
4 Have you seen analyses and comparisons like
5 that?
6 A. I have seen comparisons, I don't know
7 if that number is correct or not.
8 Q. Would that surprise you to see that
9 kind of a comparison?
10 A. The comparison wouldn't, but there's so
11 many factors that go into it. I mean, that
12 statement really simplifies it. The different
13 feeds that they have has a tremendous impact on
14 the amount of phosphate, for instance, what the
15 ingredients are; and it's a pretty general
16 statement.
17 Q. Would you look at page 4. I think it's
18 the next page maybe, at the bottom talking about
19 environmental impact. They first talk about
20 spills directly into the water have an impact.
21 It goes on to say, "In addition, the excessive
22 growth and decay of algae and other aquatic
23 organisms that feed on excessive nutrients in
24 water deplete dissolved oxygen. The resulting
25 hypoxia (low oxygen) from chronic nutrient

enrichment can result in fish kills, odor and overall degradation of water quality." Do you agree with that statement, Mr. Mullikin?

A. Based on what I know, yes.

Q. Did you know that in February of 1998 when you started this job?

A. Yes.

Q. Even then you knew that?

A. Yes.

Q. And looking on page 6 under human health concerns it talks about the aquatic ecosystems and then goes on to say, "But there are also human health concerns associated with animal waste pollution that should be studied further." Have you learned that that is true?

A. I would agree with that.

Q. And has that been discussed by any of the officers of Peterson Farms?

A. Not in discussions that I was in with them.

Q. Look on page 21, if you would please, which I think is a description of the parts of the Animal Agriculture Reform Act. Incidentally, did Peterson support or fight this

earlier, I take it?

A. Uh-huh.

Q. Were you requested to write a memo bringing people up to date?

A. At times. I don't recall if in this case I was; but at times Ms. Wilkerson would say, you know, why don't you shoot us something so that we all know where you are at and what all is going on.

Q. If we could look at the second paragraph of your memo, you say, "I personally have no opinion on whether or not the integrator or the grower owns the litter." Was this because you had heard the argument that we spoke about earlier that since the integrator owns the chicken and the feed and the bird, then it follows they really should own the litter too?

MS. BARTLEY: Object to form.

A. I think the statement there was one where I didn't feel equipped, didn't feel like I knew enough about everything that was going on to have an opinion about it.

Q. Okay. And then you go on to say, "I do feel, without any doubt, that as time passes, we the integrator will be found to be liable for it

meeting?

A. The 300 pounds was an arbitrary number. It was a number that, once again, not based on science. It was a number that someone -- I don't recall if it was the NRCS. I don't recall if it was the extension service, whether it was -- I think in the state of Oklahoma it was mandated by legislation. But this 300 pounds was a number that was set forth so that -- as I state there, I believe there was only one Peterson farm grower that was able to write his plan because of that 300-pound threshold.

Q. Or apply any litter on his fields?

A. I would agree.

MS. BARTLEY: Object to form.

Q. Is that correct?

A. Yes.

Q. And you concluded that paragraph saying, "We need to continue to support anything we can to help our growers find ways to dispose of their litter." Do you firmly believe that?

A. Yes.

Q. By the time you left, had the company done anything to help its growers dispose of litter?