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

STATE OF OKLAHOMA,	)	
	)	
Plaintiff,	)	
	)	
v.	)	**Case No. 05-CV-00329-GKF-SAJ**
	)	
TYSON FOODS, INC., et al.,	)	
	)	
Defendants.	)	

SUPPLEMENTAL OBJECTIONS AND RESPONSES OF STATE OF OKLAHOMA TO SEPARATE DEFENDANT TYSON CHICKEN, INC.'S FIRST SET OF INTERROGATORIES PROPOUNDED TO PLAINTIFFS

COMES NOW, the Plaintiff, the State of Oklahoma, ex rel. W.A. Drew Edmondson, in his capacity as Attorney General of the State of Oklahoma, and Oklahoma Secretary of the Environment, C. Miles Tolbert, in his capacity as the Trustee for Natural Resources for the State of Oklahoma under CERCLA, (hereinafter "the State") and supplements its previous response to Defendant Tyson Chicken, Inc's First Set of Interrogatories in accordance with the Court's Order of February 26, 2007 (Dkt # 1063). The State incorporates its previous responses and objections to these interrogatories as if fully stated herein. Further, the State reserves the right to supplement its responses as additional responsive information is identified.

INTERROGATORY NO. 2: Please Identify all reports, studies, publications, research, sampling data or monitoring data which demonstrates or which the State believes tends to demonstrate that the soil, water, sediments or biota in the IRW has been injured by or become contaminated with copper or copper compounds disposed of or released by the Tyson Defendants or any person or Entity for which the Tyson Defendants may allegedly be held legally responsible.

SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 2

The State incorporates and restates its general and specific objections set forth in its June 15, 2006 responses to Tyson Chicken's First Set of Interrogatories Propounded to Plaintiffs [*sic*]. Subject to and without waiving those objections, in addition to those responses, the State sets forth the following list of reports, studies, publications, research, sampling data or monitoring data as examples of reports, studies, publications, research, sampling data or monitoring data which support the State's contention that the Illinois River Watershed has been contaminated and injured by copper. This list of examples of reports, studies, publications, research, sampling data or monitoring data identifies materials which the State contends evidence or demonstrate that the soil, water, sediments, or biota in the Illinois River Watershed have been and are being injured by or contaminated by copper or copper compounds disposed of or released by the Tyson Defendants or any person or Entity for which the Tyson Defendants are legally responsible.

The State has not completed its analysis of the contamination and resulting injury of copper or copper compounds in the Illinois River Watershed. The State is continuing to characterize such injuries to the Illinois River Watershed caused by the Poultry Integrator Defendants including the Tyson Defendants and Entities for which the Tyson Defendants are legally responsible. Once that task is completed, the State, through appropriate experts, will

provide additional information by supplementing its response to this Interrogatory, or by providing expert reports.

The following list of documents are representative, but not exhaustive of documents identified by the State as support for its claim of injury and contamination of the Illinois River Watershed by copper or copper compounds:

Adamski, J.C. (1987), The Effect of Agriculture on the Quality of Ground Water in a Karstified Carbonate Terrain, Northwest Arkansas. M.S. Thesis, University of Arkansas, 124 p. **(see pages 71-81).**

Al-Qinna, M. I. (2003), Measuring and Modeling Soil Water and Solute Transport with Emphasis on Physical Mechanisms in Karst Topography. Ph.D., United States -- Arkansas University of Arkansas 272 p. **(see pages 1, 5-8, 39-42, 61-63, 107, 198-200).**

Bolan, N. S., Adriano, D. C., Mahimairaja, S. (2004), Distribution and Bioavailability of Trace Elements in Livestock and Poultry Manure by-Products. *Critical Reviews in Environmental Science and Technology* **34**(3): 291-338. **(see pages 292-293, 295, 297, 302-306, 308, 312-313, 326).**

Brown, A.V., Graening, G. O., Vendrell, P. (1998), Monitoring Cavefish Population and Environmental Quality in Cave Springs Cave, Arkansas. . Arkansas Water Resource Center Publication No. MSC-214. P 28.

Edwards, D. R., Nichols, D. J., Moore, P. A., Jr., Daniel, T. C., Srivastava, P. (1997), Vegetative Filter Strip Removal of Metals in Runoff from Poultry Litter-Amended Fescuegrass Plots. *Transactions - American Society of Agricultural Engineers* **40**(1): 121-127. **(see pages 121, 124-126).**

Fisher, D. J., Yonkos, L. T., McGee, B. L., Kane, A.S. (2003), Development and Application of Biomarkers to Evaluate Endocrine Disruption in Fish as a Result of Poultry Litter Application on the Delmarva Peninsula (R/Bt-09). Maryland Sea Grant, University System of Maryland WREC-03-01. 122 p. **(see pages 17, 27-28).**

Gascho, G. and Hubbard, R. (2006), Long-Term Impact of Broiler Litter on Chemical Properties of a Coastal Plain Soil. *Journal of Soil and Water Conservation* **61**(2): 65-74. **(see pages 65, 70-74).**

Graening, G. O. and Brown, A.V. (2000), Trophic Dynamics and Pollution Effects in Cave Springs Cave, Arkansas: A Final Report Submitted to the Arkansas Natural Heritage Commission. Arkansas Water Resources Center MSC-285. 44 p. **(see pages 1, 13, 18, 27, 29, 32, 34).**

Graening, G. O. and Brown, A.V. (2003), Ecosystem Dynamics and Pollution Effects in an Ozark Cave Stream. *Journal of the American Water Resources Association* **39**(6): 1497-1507. **(see pages 1498, 1503, 1505-1506)**

Moore, P. A., Jr., Daniel, T. C., Gilmour, J. T., Shreve, B. R., Edwards, D. R., Wood, B H. (1998) Decreasing Metal Runoff from Poultry Litter with Aluminum Sulfate. *Journal of Environmental Quality* **27**(1): 92-99. **(see pages 92, 94-96).**

Rutherford, D. W., Staver, K. W., Wershaw, R. L., Bednar, A. J., Garbarino, J. R.,Needham, R. (2003), Environmental Fate of Roxarsone in Poultry Litter. Part Ii. Mobility of Arsenic in Soils Amended with Poultry Litter. *Environmental Science and Technology* **37**(8): 1515-1520.

Oklahoma Water Resources Board, U.S. Army Corps of Engineers and Oklahoma State University. 1996. Diagnostic and Feasibility Study on Tenkiller Lake, Oklahoma. Sponsored by USEPA. Available at http://www.owrb.ok.gov/studies/reports/reports.php.

Office of the Secretary of the Environment. 2003. Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers (per Senate Bill 972, 2nd Session of the 48th Legislature, 2002). Available at http://www.environment.ok.gov/documents.html.

Office of the Secretary of the Environment. 2004. Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers (per Senate Bill 972, 2nd Session of the 48th Legislature, 2002), Calendar Year 2003 Update Report. Available at http://www.environment.ok.gov/documents.html.

Office of the Secretary of the Environment. 2005. Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers (per Senate Bill 972, 2nd Session of the 48th Legislature, 2002), 2005 Update. Available at http://www.environment.ok.gov/documents.html.

Office of the Secretary of the Environment. 2006. Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers (per Senate Bill 972, 2nd Session of the 48th Legislature, 2002), 2006 Update. Available at http://www.environment.ok.gov/documents.html.

Analytical results for phosphorus, nitrogen compounds including ammonia, copper and copper compounds, arsenic and arsenic compounds, zinc and zinc compounds are contained in the reports from Aquatic Research and A&L Analytical Laboratories. Data providing results of these substances associated with litter or soil applied with waste from Tyson associated facilities are found in A&L Analytical Laboratories Report Numbers: 06-178-204, 06-179-0204, 06-193-0223, 06-194-203, 06-181-9210, 06-187-202, 06-208-0216, 06-188-0201, 06-192-0200.

INTERROGATORY NO. 3: Please Identify all reports, studies, publications, research, sampling data or monitoring data which demonstrates or which the State believes tends to demonstrate that the soil, water, sediments or biota in the IRW has been injured by or become contaminated with hormones disposed of or released by the Tyson Defendants or any person or Entity for which the Tyson Defendants may allegedly be held legally responsible.

SUPPLEMENTAL RESPONSE TO INTERROGATORY NO 3.

The State incorporates and restates its general and specific objections set forth in its June 15, 2006 responses to Tyson Chicken's First Set of Interrogatories Propounded to Plaintiffs [*sic*]. Subject to and without waiving those objections, in addition to those responses, the State sets forth the following list of reports, studies, publications, research, sampling data or monitoring data as examples of reports, studies, publications, research, sampling data or monitoring data which support the State's contention that the Illinois River Watershed has been contaminated and injured by hormones. This list of examples of reports, studies, publications, research, sampling data or monitoring data identifies materials which the State contends evidence or demonstrate that the soil, water, sediments, or biota in the Illinois River Watershed have been and are being injured by or contaminated by hormones disposed of or released by the Tyson Defendants or any person or Entity for which the Tyson Defendants are legally responsible.

The State has not completed its analysis of the contamination and resulting injury of hormones in the Illinois River Watershed. The State is continuing to characterize such injuries to the Illinois River Watershed caused by the Poultry Integrator Defendants including the Tyson Defendants and Entities for which the Tyson Defendants are legally responsible. Once that task is completed, the State, through appropriate experts, will provide additional information by supplementing its response to this Interrogatory, or by providing expert reports.

The following list of documents are representative, but not exhaustive:

Finlay-Moore, O., Hartel, P. G., and Cabrera, M. L. (2000), 17 Beta-Estradiol and Testosterone in Soil and Runoff from Grasslands Amended with Broiler Litter. *Journal of Environmental Quality* **29**(5): 1604-1611. **(see pages 1604, 1608-1610).**

Peterson, E. W., Davis, R. K., and Orndorff, H. A. (2000), 17 Beta-Estradiol as an Indicator of Animal Waste Contamination in Mantled Karst Aquifers. *Journal of Environmental Quality* **29**(3): 826-834. **(see pages 826-827, 829-833)**

Wicks, C., Kelley, C., and Peterson, E. (2004), Estrogen in a Karstic Aquifer. *Ground Water* **42**(3): 384-389. **(see pages 384, 388).**

Bidwell, Joseph A. 2006. Occurrence of Pharmaceuticals, Hormones, and other Organic Wastewater Contaminants in Cave Water within the Lower Neosho and Illinois River Basins, Oklahoma. Water Resources Research Project 2006OK60B; abstract available at http://www.osu-ours.okstate.edu/research/06/CAS06.htm.

USGS 2002. Pharmaceuticals, hormones, and other Organic Wastewater Contaminants in U.S. Streams. Available at http://toxics.usgs.gov/pubs/FS-027-02/.

Analytical results for phosphorus, nitrogen compounds including ammonia, copper and copper compounds, arsenic and arsenic compounds, zinc and zinc compounds are contained in the reports from Aquatic Research and A&L Analytical Laboratories. Data providing results of these substances associated with litter or soil applied with waste from Tyson associated facilities are found in A&L Analytical Laboratories Report Numbers: 06-178-204, 06-179-0204, 06-193-0223, 06-194-203, 06-181-9210, 06-187-202, 06-208-0216, 06-188-0201, 06-192-0200.

INTERROGATORY NO. 4: Please Identify all reports, studies, publications, research, sampling data or monitoring data which demonstrates or which the State believes tends to demonstrate that the soil, water, sediments or biota in the IRW has been injured by or become contaminated with microbial pathogens disposed of or released by the Tyson Defendants or any person or Entity for which the Tyson Defendants may allegedly be held legally responsible.

SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 4:

The State incorporates and restates its general and specific objections set forth in its June 15, 2006 responses to Tyson Chicken's First Set of Interrogatories Propounded to Plaintiffs [*sic*]. Subject to and without waiving those objections, in addition to those responses, the State sets forth the following list of reports, studies, publications, research, sampling data or monitoring data as examples of reports, studies, publications, research, sampling data or monitoring data which support the State's contention that the Illinois River Watershed has been contaminated and injured by microbial pathogens. This list of examples of reports, studies, publications, research, sampling data or monitoring data identifies materials which the State contends evidence or demonstrate that the soil, water, sediments, or biota in the Illinois River Watershed have been and are being injured by or contaminated by microbial pathogens disposed of or released by the Tyson Defendants or any person or Entity for which the Tyson Defendants are legally responsible.

The State has not completed its analysis of the contamination and resulting injury of microbial pathogens in the Illinois River Watershed. The State is continuing to characterize such injuries to the Illinois River Watershed caused by the Poultry Integrator Defendants including the Tyson Defendants and Entities for which the Tyson Defendants are legally responsible. Once that task is completed, the State, through appropriate experts, will provide additional information by supplementing its response to this Interrogatory, or by providing expert reports.

The State hereby incorporates the documents identified in its response to Cobb Vantress' Interrogatory No. 2. The following list of documents are representative, but not exhaustive:

Avery, L. M., Killham, K., and Jones, D. L. (2005), Survival of E. Coli O157:H7 in Organic Wastes Destined for Land Application. *Journal of Applied Microbiology* 98(4): 814-22. **(see pages 814-815, 820-821).**

Coyne, M. S. and Blevins, R. L. (1995), Fecal Bacteria in Surface Runoff from Poultry-Manured Fields. *Animal Waste and the Land-Water Interface*. Boca Raton, Lewis Publishers: 77-87. **(see pages 77, 80, 82, 85-86).**

Crane, S.R., Westerman, P.W., and Overcash, M. R. (1980), Dieoff of Fecal Indicator Organisms Following Land Application of Poultry Manure. *Journal of Environmental Quality*, **9**: 531-537. **(see pages 531, 537).**

Davis, J. V. and Bell, R. W. (1998), Water-Quality Assessment of the Ozark Plateaus Study Unit, Arkansas, Kansas, Missouri, and Oklahoma; Nutrients, Bacteria, Organic Carbon, and Suspended Sediment in Surface Water, 1993-95. United States Geological Survey 98-4164. 63 p. **(see pages 1, 5, 7, 10, 19, 37-38).**

Davis, R. K., Hamilton, S., and Van Brahana, J. (2005), Escherichia Coli Survival in Mantled Karst Springs and Streams, Northwest Arkansas Ozarks, U.S.A. *Journal of the American Water Resources Association* **41**(6): 1279-1287 **(see pages 1279-1280, 1284-1286).**

Mawdsley, J. L., Bardgett, R. D., Merry, R. J., Pain, B. F., and Theodorou, M. K. (1995), Pathogens in Livestock Waste, Their Potential for Movement through Soil and Environmental Pollution. *Applied Soil Ecology : A Section of Agriculture, Ecosystems & Environment* **2**(1): 1-15. **(see pages 1-12).**

Schlottmann, A. L. 2000. Reconnaissance of the Hydrology, Water Quality, and Sources of Bacterial and Nutrient Contamination in the Ozark Plateaus Aquifer System and Cave Springs Branch of Honey Creek, Delaware County, Oklahoma, March 1999-March 2000. Water-Resources Investigations Report 00-4210, available at http://pubs.usgs.gov/wri/wri004210/

Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers (SB 972 Report), issued in 2003, 2004, 2005, and 2006. Full text of reports are located at http://www.ose.state.ok.us/documents.html#972.

Office of the Secretary for the Environment. 2003. Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers (per Senate Bill 972, 2nd Session of the 48th Legislature, 2002). Available at http://www.environment.ok.gov/documents.html.

Office of the Secretary for the Environment. 2004. Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers (per Senate Bill 972, 2nd Session of the 48th Legislature, 2002), Calendar Year 2003 Update Report. Available at http://www.environment.ok.gov/documents.html.

Office of the Secretary for the Environment. 2005. Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers (per Senate Bill 972, 2nd Session of the 48th Legislature, 2002), 2005 Update. Available at http://www.environment.ok.gov/documents.html.

Office of the Secretary for the Environment. 2006. Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers (per Senate Bill 972, 2nd Session of the 48th Legislature, 2002), 2006 Update. Available at http://www.environment.ok.gov/documents.html.

Analytical results for phosphorus, nitrogen compounds including ammonia, copper and copper compounds, arsenic and arsenic compounds, zinc and zinc compounds are contained in the reports from Aquatic Research and A&L Analytical Laboratories. Data providing results of these substances associated with litter or soil applied with waste from Tyson associated facilities are found in A&L Analytical Laboratories Report Numbers: 06-178-204, 06-179-0204, 06-193-0223, 06-194-203, 06-181-9210, 06-187-202, 06-208-0216, 06-188-0201, 06-192-0200.

INTERROGATORY NO. 5: Please Identify all reports, studies, publications, research, modeling, sampling data or monitoring data which assesses or purports to assess that relative contributions (whether expressed in percentages, pounds, tons or other units) of any or all the defendants named in this Lawsuit to any injury, loss, damage, destruction, impairment or endangerment to the natural resources within the IRW due to the alleged release or disposal of phosphorus/phosphorus compounds, nitrogen/nitrogen compounds, arsenic/arsenic compounds, zinc/zinc compounds, copper/copper compounds, hormones or microbial pathogens.

SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 5:

The State incorporates and restates its general and specific objections set forth in its June 15, 2006 responses to Tyson Chicken's First Set of Interrogatories Propounded to Plaintiffs [*sic*]. Subject to and without waiving those objections, in addition to those responses, the State sets forth the following list of reports, studies, publications, research, sampling data or monitoring data as examples of reports, studies, publications, research, sampling data or monitoring data which support the State's contention that the Illinois River Watershed has been contaminated and injured by phosphorus/phosphorus compounds, nitrogen/nitrogen compounds,

arsenic/arsenic compounds, zinc/zinc compounds, copper/copper compounds, hormones or microbial pathogens. This list of examples of reports, studies, publications, research, sampling data or monitoring data identifies materials which the State contends evidence or demonstrate that the soil, water, sediments, or biota in the Illinois River Watershed have been and are being injured by or contaminated by phosphorus/phosphorus compounds, nitrogen/nitrogen compounds, arsenic/arsenic compounds, zinc/zinc compounds, copper/copper compounds, hormones or microbial pathogens disposed of or released by the Tyson Defendants or any person or Entity for which the Tyson Defendants are legally responsible.

The State has not completed its analysis of the Defendants' relative contribution of phosphorus/phosphorus compounds, nitrogen/nitrogen compounds, arsenic/arsenic compounds, zinc/zinc compounds, copper/copper compounds, hormones or microbial pathogens in the Illinois River Watershed. The State is continuing to characterize such contributions to the Illinois River Watershed caused by the Poultry Integrator Defendants including the Tyson Defendants and Entities for which the Tyson Defendants are legally responsible. Once that task is completed, the State, through appropriate experts, will provide additional information by supplementing its response to this Interrogatory, or by providing expert reports.

The State further contends that the injuries to the Illinois River Watershed caused by phosphorus/phosphorus compounds, nitrogen/nitrogen compounds, arsenic/arsenic compounds, zinc/zinc compounds, copper/copper compounds, hormones or microbial pathogens are indivisible. The Tyson Defendants and the Entities for which they are legally responsible are therefore jointly and severally liable to the State for its injuries.

In addition, water, soil, sediment and litter analytical data collected during 2005 and 2006 were provided to Defendants in February 2007 and subsequent updates pursuant to the Court's

January 5, 2007, Order. Analytical results for phosphorus, nitrogen compounds including ammonia, copper and copper compounds, arsenic and arsenic compounds, zinc and zinc compounds are contained in the reports from Aquatic Research and A&L Analytical Laboratories. Data providing results of these substances associated with litter or soil applied with waste from Tyson associated facilities are found in A&L Analytical Laboratories Report Numbers: 06-178-204, 06-179-0204, 06-193-0223, 06-194-203, 06-181-9210, 06-187-202, 06-208-0216, 06-188-0201, 06-192-0200.

The State hereby incorporates the documents identified in its response to Tyson Foods Interrogatory No. 8. In addition, the following list of documents are representative, but not exhaustive identified by the State as support for its claim of Defendants contribution to the contamination of the Illinois River Watershed by phosphorus/phosphorus compounds, nitrogen/nitrogen compounds, arsenic/arsenic compounds, zinc/zinc compounds, cooper/cooper compounds, hormones or microbial pathogens:

Al-Qinna, M. I. (2003), Measuring and Modeling Soil Water and Solute Transport with Emphasis on Physical Mechanisms in Karst Topography. Ph.D., United States -- Arkansas University of Arkansas 272 p. **(see pages 1, 5-8, 39-42, 61-63, 107, 198-200).**

Arai, Y., Lanzirotti, A., Sutton, S., Davis, J. A., and Sparks, D. L. (2003), Arsenic Speciation and Reactivity in Poultry Litter. *Environmental Science and Technology* **37**(18): 4083-90. **(see pages 4083, 4089).**

Avery, L. M., Killham, K., and Jones, D. L. (2005), Survival of E. Coli O157:H7 in Organic Wastes Destined for Land Application. *Journal of Applied Microbiology* 98(4): 814-22. **(see pages 814-815, 820-821).**

Bellows, B. C. (2005), Arsenic in Poultry Litter: Organic Regulations. A Publication of ATTRA, the National Sustainable Agriculture Information Service 12 p. **(see pages 1-8).**

Bitton, G. and Gerba, C. P. (1994), *Groundwater Pollution Microbiology*. Krieger Pub. Co. 377 p. **(see pages vii, 50-51, 199-203).**

Coyne, M. S. and Blevins, R. L. (1995), Fecal Bacteria in Surface Runoff from Poultry-Manured Fields. *Animal Waste and the Land-Water Interface*. Boca Raton, Lewis Publishers: 77-87. **(see pages 77, 80, 82, 85-86).**

Crane, S R, Westerman, P W, and Overcash, M R. (1980) Dieoff of Fecal Indicator Organisms Following Land Application of Poultry Manure. *Journal of Environmental Quality* **9**: 531-537. **(see pages 531, 537).**

Davis, J. V. and Bell, R.W. (1998), Water-Quality Assessment of the Ozark Plateaus Study Unit, Arkansas, Kansas, Missouri, and Oklahoma; Nutrients, Bacteria, Organic Carbon, and Suspended Sediment in Surface Water, 1993-95. United States Geological Survey 98-4164. 63 p. **(see pages 1, 5, 7, 10, 19, 37-38).**

Davis, R. K., Brahana, J. V., and Johnston, J. S. (2000), Ground Water in Northwest Arkansas: Minimizing Nutrient Contamination from Non-Point Sources in Karst Terrain. Arkansas Water Resources Center MSC- 288. 69 p. **(see pages 1-3, 8, 19-21, 43-44).**

Davis, R. K., Hamilton, S., and Van Brahana, J. (2005), Escherichia Coli Survival in Mantled Karst Springs and Streams, Northwest Arkansas Ozarks, U.S.A. *Journal of the American Water Resources Association* **41**(6): 1279-1287 **(see pages 1279-1280, 1284-1286).**

Edwards, D. R. and Daniel, T. C. (1994), A Comparison of Runoff Quality Effects of Organic and Inorganic Fertilizers Applied to Fescuegrass Plots. *Water resources bulletin* **30**(1): 35-41. **(see pages 35, 40).**

Finlay-Moore, O., Hartel, P. G., and Cabrera, M.L. (2000), 17 Beta-Estradiol and Testosterone in Soil and Runoff from Grasslands Amended with Broiler Litter. *Journal of environmental quality* **29**(5): 1604-1611. **(see pages 1604, 1608-1610).**

Garbarino, J. R., Wershaw, R. L., Bednar, A. J., Rutherford, D.W., and Beyer, R. S. (2003), Environmental Fate of Roxarsone in Poultry Litter. I. Degradation of Roxarsone During Composting. *Environmental Science and Technology* **37**(8): 1509-1514. **(see pages 1515, 1520).**

Loehr, R. C. (1978), Hazardous Solid Waste from Agriculture. *Environmental Health Perspectives* **27**: 261-273. **(see pages 261-262, 265, 267-269).**

Mawdsley, J. L., Bardgett, R. D., Merry, R. J., Pain, B. F., and Theodorou, M. K. (1995), Pathogens in Livestock Waste, Their Potential for Movement through Soil and Environmental Pollution. *Applied Soil Ecology : a Section of Agriculture, Ecosystems & Environment* **2**(1): 1-15. **(see pages 1-12).**

Peterson, E. W., Davis, R. K., and Orndorff, H.A. (2000), 17 Beta-Estradiol as an Indicator of Animal Waste Contamination in Mantled Karst Aquifers. *Journal of environmental quality* **29**(3): 826-834. **(see pages 826-827, 829-833).**

Schumacher, J. G. (2003), Survival, Transport, and Sources of Fecal Bacteria in Streams and Survival in Land-Applied Poultry Litter in the Upper Shoal Creek Basin, Southwestern Missouri, 2001-2002. U.S. Geological Survey 03-4243. 45 p. **(see pages 1-2, 5, 32-38).**

Sobsey, M. D., Khatib, L.A., Hill, V. R., Atocilja, E., and Pillai, S. (2006), Pathogens in Animal Wastes and the Impacts of Waste Management Practices on Their Survival, Transport, and Fate. In *Animal Agriculture and the Environment: National Center for Manure and Animal Waste Management White Papers* (ed. J. M. Rice, D. F. Caldwell, and F. J. Humenik), American Society of Agricultural and Biological Engineers, 609-666 p. **(see pages 609-651).**

Stolz, J. F., Perera, E., Kilonzo, B., Kail, B., Crable, B., Fisher, E., Ranganathan, M., Wormer, L., and Basu, P. (2007), Biotransformation of 3-Nitro-4-Hydroxybenzene Arsonic Acid (Roxarsone) and Release of Inorganic Arsenic by Clostridium Species. *Environ. Sci. Technol.* **41**(3): 818-823. **(see pages 818, 820-822).**

Wicks, C., Kelley, C., and Peterson, E. (2004), Estrogen in a Karstic Aquifer. *Ground Water* **42**(3): 384-389. **(see pages 384, 388).**

Oklahoma Water Resources Board, U.S. Army Corps of Engineers and Oklahoma State University. 1996. Diagnostic and Feasibility Study on Tenkiller Lake, Oklahoma. Sponsored by USEPA. Available at http://www.owrb.ok.gov/studies/reports/reports.php.

Green, W. R., and B. E. Haggard. 2001. Phosphorus and nitrogen concentrations and loads at Illinois River south of Siloam Springs, Arkansas, 1997–1999. U.S. Geological Survey Water Resources Investigation Report 01–4217.

Report: OCC TASK #78 - FY 1996 319(h) TASK #210 - Output #3 ESTIMATING WATERSHED LEVEL NONPOINT SOURCE LOADING FOR THE STATE OF OKLAHOMA (OSU).

Report: USGS Prepared in Cooperation with the Arkansas Soil and Water Conservation Commission – Phosphorus and Nitrogen Concentrations and Loads at Illinois River South of Siloam Springs, Arkansas, 1997 – 1999 OSRC 2-10.

Report: USGS National Water-Quality Assessment Program – Water-Quality Assessment of the Ozark Plateaus Study Unit, Arkansas, Kansas, Missouri, and Oklahoma – Nutrients, Bacteria, Organic Carbon, and Suspended Sediment in Surface Water, 1993-95 OSRC 2-11.

Report: USGS Preliminary Analysis of Phosphorus Concentrations and Fecal-Indicator Bacteria Counts at Selected Sites in the Illinois River Basin in Oklahoma, 1997-2001 OSRC 2-13.

Report: Basin-Wide Pollution Inventory for the Illinois River Comprehensive Basin Management Program – Final Report- Daniel Storm 8/96 OSRC 3-1.

Report: Recent Total Phosphorus Loads in the Illinois River in Arkansas compared to loads in 1980-1993 – by Martin Maner P.E. ADEQ 2/8/2000 OSRC 7-2B.

Report: An Investigation of the Sources and Transport of Nonpoint Source Nutrients in the Illinois River Basin in Oklahoma and Arkansas (Gade 1998) http://storm.okstate.edu/.

Report: Comprehensive Basin Management Plan for the Illinois River Basin in Oklahoma, OCC, May, 1999 available at http://www.okcc.state.ok.us/WQ/WQ_reports/REPORT085.pdf.

Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers (SB 972 Report), issued in 2003, 2004, 2005, and 2006. Full text of reports are located at http://www.ose.state.ok.us/documents.html#972.

Phosphorus Concentrations, Loads and Yields in the Illinois River Basin, Arkansas and Oklahoma, 1997-2001, p. 1, (http://pubs.usgs.gov/wri/wri034168/).

Phosphorus Concentrations, Loads and Yields in the Illinois River Basin, Arkansas and Oklahoma, 2000-2004, (http://pubs.usgs.gov/sir/2006/5175/).

INTERROGATORY NO. 6: Please Identify all reports, studies, publications, research, sampling data or monitoring data which You contend establishes or tends to establish the contamination, degradation, pollution or any other adverse impact upon any Water Body in the IRW as result of the release of phosphorus or phosphorus compounds.

SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 6:

The State incorporates and restates its general and specific objections set forth in its June 15, 2006 responses to Tyson Chicken's First Set of Interrogatories Propounded to Plaintiffs [*sic*]. Subject to and without waiving those objections, in addition to those responses, the State sets forth the following list of reports, studies, publications, research, sampling data or monitoring data as examples of reports, studies, publications, research, sampling data or monitoring data which support the State's contention that the Illinois River Watershed has been contaminated and injured by phosphorus and/or phosphorus compounds. This list of examples of reports, studies, publications, research, sampling data or monitoring data identifies materials which the State contends evidence or demonstrate that the soil, water, sediments, or biota in the Illinois River Watershed have been and are being injured by or contaminated by phosphorus or

phosphorus compounds disposed of or released by the Tyson Defendants or any person or Entity for which the Tyson Defendants are legally responsible.

The State has not completed its analysis of the adverse impacts that are the result of the release of phosphorus or phosphorus compounds in the Illinois River Watershed. The State is continuing to characterize such adverse impacts to the Illinois River Watershed. Once that task is completed, the State, through appropriate experts, will provide additional information by supplementing its response to this Interrogatory, or by providing expert reports.

The State hereby incorporates the documents identified in its response to Tyson Foods Interrogatory No. 8. In addition, the following list of documents is representative, but is not an exhaustive list of document identified by the State as showing the adverse impact to the Illinois River Watershed by phosphorus or phosphorus compounds:

Al-Qinna, M. I. (2003) Measuring and Modeling Soil Water and Solute Transport with Emphasis on Physical Mechanisms in Karst Topography. Ph.D., United States -- Arkansas University of Arkansas 272 p. **(see pages 1, 5-8, 39-42, 61-63, 107, 198-200).**

Breeuwsma, A., Reijerink, J. G. A. and Schoumans, O.F. (1995), Impact of Manure on Accumulation and Leaching of Phosphate in Areas of Intensive Livestock Farming. Animal Waste and the Land-Water Interface. Boca Raton, Lewis Publishers: 239-249. **(see pages 239-241, 243-248).**

Combs, S. M. and Bundy, L. G. (1995), Waste-Amended Soils: Methods of Analysis and Considerations in Interpretation of Analytical Results. Animal Waste and the Land-Water Interface. Boca Raton, Lewis Publishers: 15-26. **(see page 22).**

Daniels, M., Daniel, T. C., Carman, D., Morgan, R., Langston, J. L., and VanDevender, K. (1999), Soil Phosphorus Levels: Concerns and Recommendations. University of Arkansas Cooperative Extension Service FSA1029. 6 p. **(see pages 2-5).**

Davis, R. K., Brahana, J. V., and Johnston, J. S. (2000), Ground Water in Northwest Arkansas: Minimizing Nutrient Contamination from Non-Point Sources in Karst Terrain. Arkansas Water Resources Center MSC- 288. 69 p. **(see pages 1-3, 8, 19-21, 43-44).**

Edwards, D. R., Daniel, T.C., Murdoch, J. F., and Moore, P.A., Jr. (1996), Quality of Runoff from Four Northwest Arkansas Pasture Fields Treated with Organic and Inorganic Fertilizer. *Transactions - American Society of Agricultural Engineers* **39**(5): 1689-1696. **(see pages 1689, 1695).**

Gade, D.R. (1998) An Investigation of the Sources and Transport of Nonpoint Source Nutrients in the Illinois River Basin in Oklahoma and Arkansas. M.S. Thesis, Oklahoma State University, 286 p. **(see pages 2-3, 221-223).**

Haggard, B. E., Moore, J.P.A., Chaubey, I., and Stanley, E. H. (2003), Nitrogen and Phosphorus Concentrations and Export from an Ozark Plateau Catchment in the United States. *Biosystems Engineering* **86**(1): 75-85. **(see pages 75-76, 82-84).**

Johnson, A. F., Vietor, D. M., Rouquette, F. M., Jr., and Haby, V.A. (2004), Fate of Phosphorus in Dairy Wastewater and Poultry Litter Applied on Grassland. *Journal of environmental quality* **33**: 735-739. **(see pages 735,739).**

Kleinman, P. J. and Sharpley, A. N. (2003), Effect of Broadcast Manure on Runoff Phosphorus Concentrations over Successive Rainfall Events. *Journal of Environmental Quality* **32**(3): 1072-81. **(see pages 1072-1073, 1079-1080).**

Mikkelsen, R. L .and Gilliam, J. W. (1995), Animal Waste Management and Edge of Field Losses. Animal Waste and the Land-Water Interface. Boca Raton, Lewis Publishers: 57-68. **(see pages 57-60, 62-63, 65).**

Moore, P.A., Jr., Daniel, T.C., Sharpley, A.N., and Wood, C.W. (1995), Poultry Manure Management: Environmentally Sound Options. *Journal of soil and water conservation* **50**(3): 321-327. **(see pages 321-322, 325, 327).**

Robinson, J. S., Sharpley, A. N. and Smith, S. J. (1995), The Effect of Animal Manure Applications on the Forms of Soil Phosphorus. Animal Waste and the Land-Water Interface. Boca Raton, Lewis Publishers: 43-48. **(see pages 43, 47).**

Sharpley, A. N. (1997), Rainfall Frequency and Nitrogen and Phosphorus Runoff from Soil Amended with Poultry Litter. *Journal of environmental quality* **26**(4): 1127-1132. **(see pages 1127, 1131-1132).**

Sharpley, A. (1999) Agricultural Phosphorus, Water Quality, and Poultry Production: Are They Compatible? *Poultry Science* **78**(5): 660-673. **(see pages 660-661, 663, 668-672).**

Sharpley, A. N., Daniel, T. C., Sims, J. T., Lemunyon, J., Stevens, R., and Parry, R. (1999), Agricultural Phosphorus and Eutrophication. Agricultural Research Service, U.S. Dept. of Agriculture. ARS-149. 37 p. **(see pages 1-37).**

Sharpley, A. N., Smith, S. J., and Bain, W.R. (1993), Nitrogen and Phosphorus Fate from Long-Term Poultry Litter Applications to Oklahoma Soils. *Soil Science Society of America journal* **57**(4): 1131-1137 **(see pages 1131, 1136-1137).**

Wood, C.W. and Hattey, J.A. (1995), Impacts of Long-Term Manure Applications on Soil Chemical, Microbiological, and Physical Properties. Animal Waste and the Land-Water Interface. Boca Raton, Lewis Publishers: 419-428. **(see pages 420-422, 426-427).**

Xu, F. and Prato, T. (1995), Optimal Farm-Level Use and Value of Broiler Litter. Animal Waste and the Land-Water Interface. Boca Raton, Lewis Publishers: 283-291. **(see pages 283-291).**

Oklahoma Water Resources Board, U.S. Army Corps of Engineers and Oklahoma State University. 1996. Diagnostic and Feasibility Study on Tenkiller Lake, Oklahoma. Sponsored by USEPA. Available at http://www.owrb.ok.gov/studies/reports/reports.php.

Comprehensive Basin Management Plan for the Illinois River Basin in Oklahoma, OCC, May, 1999 available at http://www.okcc.state.ok.us/WQ/WQ_reports/REPORT085.pdf.

Coordinated Watershed Restoration and Protection Strategy for Oklahoma's Impaired Scenic Rivers (SB 972 Report), issued in 2003, 2004, 2005, and 2006. Full text of reports are located at http://www.ose.state.ok.us/documents.html#972.

Phosphorus Concentrations, Loads and Yields in the Illinois River Basin, Arkansas and Oklahoma, 1997-2001, p. 1, (http://pubs.usgs.gov/wri/wri034168/).

Phosphorus Concentrations, Loads and Yields in the Illinois River Basin, Arkansas and Oklahoma, 2000-2004, (http://pubs.usgs.gov/sir/2006/5175/).

INTERROGATORY NO. 10: Please Identify all reports, studies, publications, research, sampling data or monitoring data which You contend establishes or tends to establish the contamination, degradation, pollution or any other adverse impact upon any Water Body in the IRW as result of the release of copper or copper compounds.

SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 10:

The State incorporates its response to Interrogatory No.2 as stated fully herein.

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VERIFICATION

STATE OF OKLAHOMA)
) ss:
COUNTY OF OKLAHOMA)

I, Miles Tolbert, being of legal age, hereby depose and state that I have read the foregoing supplemental responses to these interrogatory and that they are true and correct, to the best of my knowledge and belief, and that I furnish such supplemental responses based on consultation with the representatives of the State of Oklahoma based on documents identified as of the date of this response.

Miles Tolbert
Secretary of the Environment
State of Oklahoma

Signed and subscribed to before me on this 27th day of April, 2007

Shane Green
Notary Public

My Commission Expires:
3-9-10
My Commission Number:
06002615

SHANE GREEN
Notary Public
State of Oklahoma
Commission # 06002615 Expires 03/09/10