

**Poultry Litter Transport from the Eucha-Spavinaw and the Illinois  
River Watersheds (Oklahoma) to Non-Nutrient Limited Watersheds:**

**Final Report**

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**Prepared by:**



OKLAHOMA CONSERVATION COMMISSION  
WATER QUALITY DIVISION  
4545 N. LINCOLN BLVD., SUITE 11A  
OKLAHOMA CITY, OK 73105

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## Table of Contents

INTRODUCTION.....	3
PROJECT DESCRIPTION .....	4
PROGRAM RESULTS .....	6
Literature Cited.....	9
APPENDIX A.....	10

### List of Figures

Figure 1. Map of Tonnage of Poultry Litter Transferred from Illinois River and Eucha Spavinaw Watersheds to Non-Nutrient Limited Watersheds in Oklahoma.....	7
Figure 2. Photo of Poultry Litter Spreader purchased by Talihina CD in 2009.....	8
Figure 3. Photo of Poultry Litter Spreader purchased by Kay CD in 2009.....	8

### List of Tables

Table 1. Poultry Litter Transfer Program Funding and Tonnage moved by receiving Conservation Districts.....	6
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## INTRODUCTION:

Poultry operations are heavily concentrated in the eastern portion of Oklahoma. As a result, large amounts of poultry litter have been applied to the surrounding land as fertilizer. Poultry litter is commonly used as a fertilizer because it contains nitrogen and phosphorus, which are important nutrients for plant growth. Application rates determined by the NRCS are calculated to meet the nitrogen requirement of the crop receiving the litter; however, the litter applied contains more phosphorus than can be utilized by the vegetation. Over the years, the soils in the watersheds surrounding the poultry operations have accumulated excess phosphorus in the soils, which may enter streams, rivers, and lakes during runoff events.

An excess of nutrients in the water, especially phosphorus (often the limiting nutrient for plant growth) can be detrimental to water quality. In cases where phosphorus is significantly increased relative to nitrogen, blue-green algal growth is favored (Wetzel, 1983). Eutrophication, or increased nutrients and resulting productivity of algae, has been linked to numerous human health and ecological problems. Some of these problems include increased human illnesses and fish kills. Eutrophication adversely affects the color, smell, and taste of drinking water in reservoirs. These changes result in a higher water treatment cost for cities. The City of Tulsa has been dealing with such issues and has spent much money treating its main water supply, Spavinaw Lake, a watershed focus of this project.

Due to the unfavorable impacts of concentrated poultry litter application in nutrient-limited watersheds, the OCC decided to aid in the transfer of poultry litter to areas of the state where it would not adversely affect the water and would provide much needed agronomic benefit. The Litter Transfer Program was designed to transport litter to areas of the state where the soils are low in nutrients and the litter can be utilized as a plant fertilizer and soil amendment. Export enables the nutrients from litter to be utilized to meet the nutritional needs for row crops, pasture, forage, and grass lands production in areas with lower soil phosphorus and nutrient levels. The bedding portion of the litter, rice hulls or wood shavings, provide organic material that improve the soil quality.

According to Oklahoma statute, poultry waste is “poultry excrement, poultry carcasses, feed wastes, or any other waste associated with the confinement of poultry from a poultry feeding operation”. Colloquially, many people speak of the combination of bedding material and waste removed from the houses at cleanout as “litter”. Therefore, for the remainder of the report, the terms “litter” and “waste” will be used interchangeably to refer to the combination of excrement, feed wastes, and bedding materials removed from the house at cleanout.

## PROJECT DESCRIPTION:

The purpose of the fy 2008 Poultry Litter Transfer Program was to protect water quality in the Illinois and Eucha-Spavinaw Watersheds by reducing land application of poultry litter through exportation. The objective of the program was to haul litter from the Illinois and Eucha-Spavinaw Watersheds to non-nutrient limited watersheds in Oklahoma where it can be safely used as fertilizer.

The program was designed to offer incentive payments to buyers based on the tonnage and mileage of exportation. Haulers and growers were not subsidized through this program and buyers were responsible for locating their own sources and haulers of litter. Nutrient limited watersheds or those watersheds which have been determined to be sensitive to nutrient enrichment (see Appendix A) were not eligible for subsidy through the program.

Under this project the decision was made to establish the allowable subsidy to \$0.03 /ton/mile. This subsidy allowed for additional monies to move more litter than in previous programs. Applicants received a subsidy up to \$10,000. Conservation Districts where the litter was applied and through which subsidy payments were paid were eligible to receive up to \$1/ton to provide administrative assistance to buyers for participation in the incentive program. Activities funded in this project began in March 2008 and ended in December 2009.

The following requirements had to be met for participation in the Litter Transfer Program:

- Litter had to originate from the Eucha-Spavinaw or Illinois River Watersheds.
- A landowner had to apply waste based on nutrient analysis from the soil and litter tests.
- A landowner had to have, or at least have applied for a nutrient management plan from NRCS.
- A maximum of \$10,000 cap in program funds was allowed for each farm.
- Land where the litter was to be applied had to be at least 10 miles from the nutrient source. AFO and CAFO producers were not eligible to participate.
- Litter had to be applied according to a current Nutrient Management Plan (NMP) and in compliance with State law that requires application by a certified applicator. Proof of applicator certification had to be provided to qualify for the subsidy.
- No animal wastes could be applied on Forest, Grazed Forest, Grazed Range, &/or Native or Naturalized Pasture under these incentive payments.
- This program was administered by local Conservation Districts, which ensured buyers completed the steps necessary to receive the subsidy. Conservation Districts who support the program were eligible to receive \$1.00/ton for the litter that moved to their district. In return for these administrative fees, Conservation Districts processed claims and advertised the program.

To approve payment of poultry litter transfer subsidy to farm operators, the following work tasks were required by participating Conservation Districts:

1. Photocopy of current soil test of the field where litter was to be applied
2. Photocopy of the litter applicator's license
3. Photocopies of certified scales weigh tickets of loaded weight and empty weight of all trucks used to transport litter used to verify the amount of litter applied
4. Verification of a current Comprehensive Nutrient Management Plan for fields where litter was to be applied
5. Legal location, lat/long or street address of the origin of the litter
6. Photocopy of hauler's bill to purchaser showing mileage hauled.

The program was advertised and facilitated through the Oklahoma State University Cooperative Extension Service's website ([www.ok-littermarket.org](http://www.ok-littermarket.org)). The website posted information about the subsidy program and offered a place for buyers, haulers, and sellers to list their information to arrange litter sales. Extension specialists also facilitated the program and helped local producers better understand the options open to them regarding the use of poultry litter as a fertilizer. Additional information was also provided through OSU Cooperative Extensions' educational website, [www.poultrywaste.okstate.edu/links.asp](http://www.poultrywaste.okstate.edu/links.asp).



## PROGRAM RESULTS:

This program funded the movement of 70,682.14 tons of litter from the Illinois River and Eucha Spavinaw watersheds into non-nutrient limited or non-nutrient threatened watersheds in Oklahoma between March 2008 and December 2009. Tonnage totals moved by the 29 participating conservation districts are shown in both Table 1 and Figure 1. Litter spreaders purchased by Kay and Talihina Conservation Districts are shown in Figure 2 and Figure 3. A total of \$28,975 federal funds and \$4,350 non-federal (district) funds were used to purchase the poultry litter spreader equipment for Kay and Talihina Conservation Districts. Federal funds expended for litter transfer totaled \$140,094.36. The total state funding was \$218,183.66.

**Table 1. Poultry Litter Transfer Program funding and tonnage moved by receiving Cons. Districts.**

<b>Poultry Litter Transfer Program</b>				
<b>District</b>	<b>Tons</b>	<b>Federal Funds</b>	<b>State Funds</b>	<b>Equipment Federal Funds</b>
<b>Adair Co. CD</b>	<b>528.90</b>	\$1,862.38		
<b>Caney Valley CD</b>	<b>793.60</b>		\$4,674.38	
<b>Checotah CD</b>	<b>1,564.86</b>	\$9,357.23		
<b>Comanche Co. CD</b>	<b>263.12</b>		\$2,362.82	
<b>Craig Co. CD</b>	<b>11,518.14</b>	\$18,802.53	\$21,285.11	
<b>Garfield Co. CD</b>	<b>4,746.25</b>		\$37,712.56	
<b>Grady Co. CD</b>	<b>972.32</b>		\$8,598.53	
<b>Grant Co. CD</b>	<b>1,603.78</b>		\$12,235.00	
<b>Haskell Co. CD</b>	<b>163.20</b>		\$725.55	
<b>Hughes Co. CD</b>	<b>548.40</b>	\$1,057.80	\$375.76	
<b>Jefferson Co. CD</b>	<b>2,156.26</b>		\$19,405.64	
<b>Kay Co. CD</b>	<b>2,003.62</b>		\$13,977.64	\$15,925.00
<b>Konawa CD</b>	<b>428.50</b>	\$3,428.00		
<b>LeFlore Co. CD</b>	<b>8,587.70</b>	\$17,645.50		
<b>Lincoln Co. CD</b>	<b>5,472.45</b>	\$14,908.30	\$7,237.51	
<b>McIntosh Co. CD</b>	<b>1,817.40</b>	\$12,532.94		
<b>Muskogee Co. CD</b>	<b>2,904.72</b>	\$5,153.34	\$7,741.17	
<b>Noble Co. CD</b>	<b>5,949.21</b>		\$44,879.72	
<b>Nowata Co. CD</b>	<b>77.90</b>	\$606.80		
<b>Okfuskee Co. CD</b>	<b>389.90</b>	\$3,314.90		
<b>Okmulgee Co. CD</b>	<b>5,536.48</b>	\$4,671.04	\$16,221.95	
<b>Osage Co CD</b>	<b>834.00</b>	\$7,506.00		
<b>Ottawa Co. CD</b>	<b>1,921.04</b>	\$4,415.54		
<b>Pawnee Co. CD</b>	<b>697.50</b>	\$2,946.27	\$1,919.50	
<b>Payne Co. CD</b>	<b>1,732.38</b>	\$9,808.85	\$2,960.34	
<b>Seminole Co. CD</b>	<b>2,208.76</b>	\$5,465.40	\$9,419.36	
<b>Sequoyah Co. CD</b>	<b>2,133.40</b>	\$1,457.00	\$6,210.42	
<b>Talihina CD</b>				\$13,050.81
<b>Wagoner Co. CD</b>	<b>3,128.35</b>	\$15,154.54	\$240.70	
<b>Totals</b>	<b>70,682.14</b>	<b>\$140,094.36</b>	<b>\$218,183.66</b>	<b>\$28,975.81</b>

**Figure 1. Tons of poultry litter (indicated by numbers in respective conservation districts) transferred from the Illinois River and Eucha Spavinaw Watersheds to non-nutrient limited watersheds in Oklahoma.**

**Tons of Poultry Litter Transferred  
from Illinois River and Eucha/Spavinaw Watersheds to  
Non-Nutrient Limited Watersheds in Oklahoma**

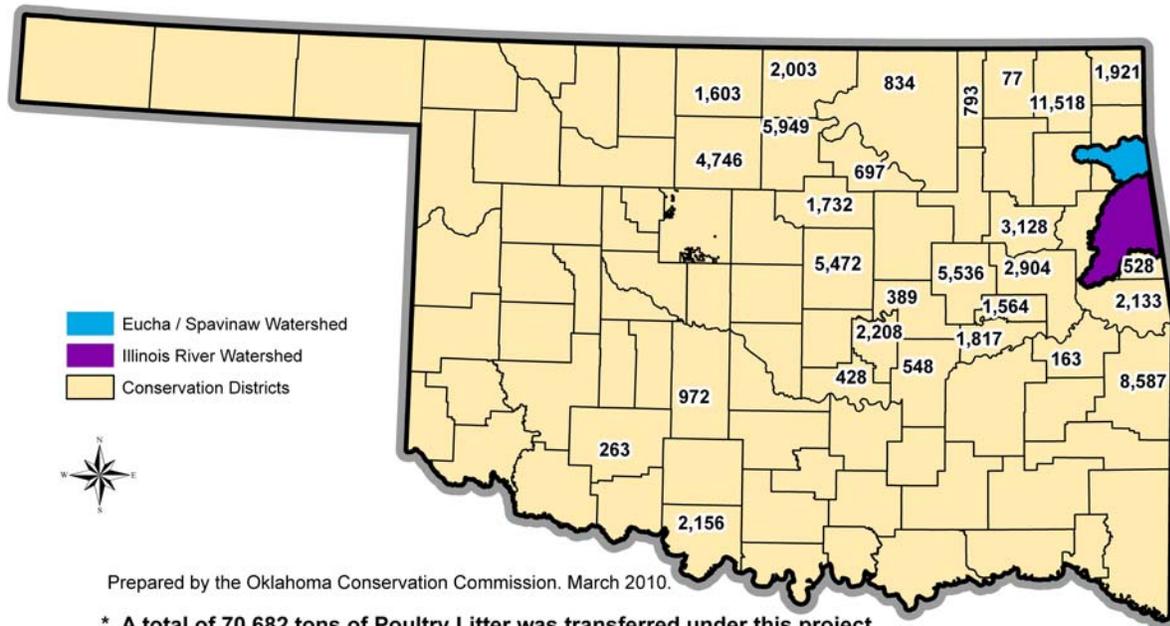




Figure 2. Poultry litter spreader purchased by the Talihina Conservation District in 2009.



Figure 3. Poultry litter spreader purchased by the Kay County Conservation District in 2009.

## Literature Cited:

NRCS, United States Department of Agriculture. 1994. *The Phosphorus Index, A Phosphorus Assessment Tool*.

[www.nrcs.usda.gov/TECHNICAL/ECS/nutrient/pindex.html](http://www.nrcs.usda.gov/TECHNICAL/ECS/nutrient/pindex.html).

Wetzel, R.G. 1983. *Limnology*, 2<sup>nd</sup> Edition. Saunders College Publishing, a division of Holt, Rinehart & Winston, Inc. Philadelphia.

## APPENDIX A. Nutrient Limited Watersheds

### Litter Transfer Program- Determining Eligible Areas

In order to determine whether land is eligible for litter application or whether litter has originated in the Illinois River or Eucha/Spavinaw watersheds, we have developed a series of maps of nutrient limited watersheds in Oklahoma where landowners wishing to apply litter are not eligible for subsidy through the program. These watersheds include:

1. Illinois River in Delaware, Adair, Cherokee, and Sequoyah Counties,
2. Eucha/Spavinaw Watersheds in Delaware and Mayes Counties,
3. Lake Carl Etling Watershed in Cimarron County,
4. Claremore Lake Watershed in Rogers County,
5. Elk City Lake Watershed in Beckham County,
6. Fort Cobb Watershed in Washita, Caddo, and Custer Counties,
7. Fort Gibson Lake Watershed in Craig, Rogers, Mayes, Delaware, Wagoner, and Cherokee Counties,
8. Fort Supply Watershed in Ellis and Woodward Counties,
9. Great Salt Plains Watershed in Woods and Alfalfa Counties,
10. Hudson Lake Watershed in Craig, Mayes, and Delaware Counties,
11. Hulah Lake Watershed in Osage County,
12. Overholser Lake Watershed in Blaine, Kingfisher, Canadian, Oklahoma, and Dewey Counties,
13. Ozzie Cobb Lake Watershed in Pushmataha County,
14. New Spiro Lake in LeFlore County
15. Rocky Hobart Watershed in Washita County
16. Taylor Lake Watershed in Grady County
17. Thunderbird Lake in Cleveland and Oklahoma Counties
18. Vanderwork Watershed in Washita, County, and
19. Wister Lake Watershed in Latimer and LeFlore Counties

Also included are Arkansas maps to help determine whether or not the sources of litter are in eligible watersheds. These maps also pinpoint the locations of some poultry houses as noted by Arkansas records. Although the locations of houses may not be completely current, most of the operational houses should be noted on these maps.

Some of these maps cover large areas; however, the detail should be sufficient to allow you to zoom in to areas of interest to verify whether or not they are within eligible areas. (Maps will be made available upon request.)