

**Marketing Compost Manure to Public Entities
Texas Cooperative Extension
FY 01 319(h) Nonpoint Source Grant
TCEQ Contract No. 582-2-44407**

Quarter no. 9 From 6/01/04 Through 8/31/04.

I. Introduction/Abstract

Progress overall was evaluated in quarter 9 as project personnel look forward to beginning final year of project activities. As expected, market development continued to be a primary effort. Dairy compost demonstrations were completed in counties surrounding the Bosque River Watershed and plans to continue demonstrations into next year are in place. Project personnel continued to work with North Central Texas and Central Texas Council of Government's in promoting use of organic material, specifically, dairy compost. RAA continued and finalized the municipal sales calls and TWRI distributed project materials to all who requested information. Interest in the Upper Leon Soil and Water Conservation District Rebate Program was noted in several areas.

Alternative market development included the arrangement of dairy applications on Fort Hood. Additionally, project personnel worked to improve organic matter status of composted material to increase dairy compost producers ability to compete in TxDOT market. RAA completed the survey portion of the organic matter improvement study and TCE outlined plan of action for study establishment.

Due to complexity of project budget (separation of fund 1 and fund 2), many hours were dedicated to development of financial status reports and full utilization of fund 1. Final billing will be submitted by October 15 with any overlooked or delayed fund 1 expenses being reported by October 26 as TCEQ requires all billing finalized by October 29, 2004. TWRI will meet with TCE personnel to establish plan of action for final year activities including budget expenditures.

II. Overall Progress and Results by Specific Work Task within each Phase

PHASE 1

Task 1.1 Texas Water Resources Institute (TWRI) will serve as the prime contractor for the project and provide overall administration required fulfilling the "Technical Contractor" responsibilities under the Texas Commission on Environmental Quality (TCEQ) Composted Manure Incentive Project scope of work. Responsibilities include planning and facilitating meetings; negotiating subcontracts; submitting reimbursement documents and appropriate documentation of project progress; handling budget and fiscal reviews; adherence to Texas State Soil and Water Conservation Board (TSSWCB) and TCEQ nonpoint source management program; and ensure all activities, deliverables

and tasks follow TCEQ contract provisions.

The following actions have been completed during this reporting period:

- a. Administrative tasks completed by TWRI will fall under phase II activities from this point forward.

Task 2.1 Assess the potential market, the compost product quality, existing educational and promotional materials available for a composted manure marketing project, and research and demonstration needs.

The following actions have been completed during this reporting period:

- a. No progress to report at this time.

Task 2.2 Develop a strategic Compost Education and Marketing Plan (CEMP). The CEMP will include a Research/Demonstration Design Plan (RDDP) to address the research and demonstration needs and a Quality Assurance Project Plan (QAPP) to address environmental data collection.

The following actions have been completed during this reporting period:

- a. Data collection and maintenance of applied research studies continued at Stephenville and Dallas.

Task 2.3 Implement the strategic CEMP. The CEMP will provide educational outreach, technical assistance, and documented materials for compost producers and users. It will also provide for the direct marketing of composted manure. The CEMP will target both public entities and private citizens throughout the region.

The following actions have been completed during this reporting period:

- a. TCE participated in Compost Roundtable Discussion on 7-1-04 hosted by North Central Texas COG. With assistance from TCEQ, Roundtable participants were able to discuss the potential to share green waste with dairy composters in need of a carbon additive.
- b. TCE presented information on compost production, compost use, and the incentive program at two workshops hosted by Central Texas Council of Government. The Temple workshop was held on 7-21-04 and the Cameron workshop was held on 7-28-04. Participants expressed interest in utilizing compost in their management programs.
- c. TCE distributed a news release on the development of the Upper Leon Soil & Water Conservation District Rebate Program.
- d. TCE revised the 3 developed news releases into 2 articles covering the following topics: the basics of compost and its use; dairy manure compost facilities and the incentive to purchase dairy compost. The news releases were submitted to TCEQ on 8-2-04. TCE has not received final approval from TCEQ to release the articles.
- e. To expedite the release of these articles as well as additional articles in the future, TCE developed a list of media contacts in and near the Bosque River

Watershed. The list was used to distribute announcement related to the Upper Leon Soil & Water Conservation District Rebate Program. TCE will share distribution list with TCEQ per request.

- f. Additional interest in the Upper Leon Soil and Water Conservation District Rebate Program also materialized during this quarter. Specific individuals contacting TCE or participating SWCDs include:
- Mr. Carl Symms of Grove contacted both TSSWCB and TWRI to inquire about participating in ULSWCD Rebate program for compost use as a potting medium in nursery. Mr. Symms is eligible to participate as he is within Hamilton-Coryell SWCD boundary. TCEQ granted permission to Mr. Symms obtain the reduced price without obtaining a TSSWCB approved Water Quality Management Plan as his use did not pose a threat to water quality via storm runoff.
 - Mr. Will Thompson of Carlton, TX contacted O'Neals Compost Facility and TWRI about participating in the ULSWCD program. Mr. Thompson was directed to contact the Cross Timbers SWCD. It was projected that Mr. Thompson would require a TSSWCB approved Water Quality Management Plan as his potential compost application would be on 1000 acres.
 - Mr. Jeremy Barwick contacted Bosque River Compost and TWRI about participating in the ULSWCD program. Mr. Barwick would like to apply compost to establish vegetation to remediate erosion prone areas. TWRI contacted Cross Timbers SWCD regarding Mr. Barwick's WQMP and a site visit was scheduled.
 - Ms. Fern Hardin contacted TCE regarding the use of dairy compost on private lands in Kaufman and Limestone Counties. While Ms. Hardin was not eligible for ULSWCD Rebate program (not within participating SWCD) or TCEQ incentive payment, Ms. Hardin was given information regarding proper use and contact information for dairy compost producers. Further, Ms. Hardin was directed to project Web site for additional information.

Task 2.4 Develop a project web site comprised of technical information for project cooperators, demonstration locations and research data, sources of available compost, educational literature from TCE, and facts about TCEQ rebate program and the TCEQ and TSSWCB nonpoint source management program.

- The following actions have been completed during this reporting period:
- a. Following permit approval, the Dairy Cow Compost facility contact information and location were added to the Web site under Compost Producers Link
 - b. Information regarding Upper Leon Soil and Water Conservation District Rebate Program was added to project Web site and links to TCEQs Web site regarding Composted Manure Incentive Payment was also added to rebate section of Web site.
 - c. Updated quarterly progress reports and deliverable schedule were added to

- Web site under Project Overview Link.
- d. Links for 6 applied research studies and the 7 county demonstrations related to the dairy compost utilization project were added to the Web site. Links include location, contact information, treatments, photos and results for each study or demonstration. Specialists or County Agents directly involved with each demo will assist project personnel in keeping individual links up to date.
 - e. Presentations from Council of Government Workshops and educational/training events were added to the Web site under Compost Use Resources link. Addition of these presentations provides workshop participants access to information after an event ends.

Task 3.1 Provide TCEQ with assistance for quality assurance activities. Compost production sites will be evaluated to ensure sound production practices and at least 20 random site visits will be conducted to monitor uses of compost to ensure applications, BMPs and rates are made in an environmentally appropriate manner.

The following actions have been completed during this reporting period:

- a. TCE personnel assisted agents in installing demonstration at Palo Pinto County.
- b. Dairy Compost Demonstration was established in Palo Pinto County at the Santo ISD High School football field. In cooperation with TCE, Santo ISD purchased compost and applied and received the TCEQ Composted Manure Incentive Payment.
- c. Due to inventory demand, the dairy compost demonstrations at Lovell Lawn and Landscape located in Stephenville was not brought to completion. However, personnel noted the use of composted material as a potting media was an improvement over the more traditional potting mix. Further, the plants did not stress as much and water requirements were reduced considerably. In conclusion, the higher organic matter dairy manure compost provided the plants with faster growth. As a result, Lovell Lawn and Landscape plans to utilize the material again on a trial basis this fall and have stated they will definitely use the product in the future.
- d. Additionally, County Extension Agents in Stephens and Palo Pinto County have both conveyed local interest in utilizing dairy compost for spring applications in 2005.

Task 3.2 Where existing guidance literature is lacking, reports of current and past field trials and result demonstration activities will be documented and published. All effective compost production and use aspects will be documented in draft case studies, cost analysis and effectiveness assessment reports.

The following actions have been completed during this reporting period:

- a. TCE graduate assistant working on applied research studies in Stephenville completed academic work and is in process of completing statistical analysis of data and compilation of thesis regarding use of dairy manure compost rate and timing in coastal bermudagrass production.

- b. Two separate TAES graduate assistants working on applied research studies in Stephenville will be presenting data on two separate studies at Tri-Society Meetings in Seattle, Washington during November, 2004.

PHASE II

Task 1.1 TWRI will continue to provide overall administration required to fulfill the "Technical Contractor" responsibilities under the TCEQ Composted Manure Incentive Project scope of work in FY 2004. In addition to the responsibilities detailed in the Phase I scope of work, TWRI will negotiate a subcontract with a Compost Marketing Firm to assist with marketing and educational tasks.

The following actions have been completed during this reporting period:

- a. TWRI completed a detailed outline of all budget expenditures from fund 1 and fund 2 throughout project duration. Budget outline was utilized to complete financial status reports to ensure efficient utilization of project funds in a timely manner. TWRI projects to outline all final year budget plans during next quarter.
- b. Contract amendment and revised budget were signed and approved by TAMU Contracts and Grants Office and returned to TCEQ and finalized. . Amendment and additional funding (total project cost of \$1,523,817 with a maximum TCEQ obligation of \$939,094) were made to TCEQ Contract No. 582-2-44407.
- c. Additional funds were designated for the purchase, delivery and application of compost on Fort Hood Training areas, specifically, abandoned tank trails.
- d. TWRI facilitated agreements with six dairy manure compost producers, who agreed to supply compost and delivery of material for a set price of \$10 per cubic yard and \$3 per loaded mile. Transportation costs were knowingly set higher than average because hauling distance was estimated and projected to be less than actual distance.
- e. TWRI also facilitated the announcement and posting of the bid package for application services associated with Fort Hood training areas. GeoSource, Inc. out of Bulverde, TX was awarded the contract with a low bid of \$16,272.
- f. Seed purchase for vegetation establishment along the prepared and treated tank trails was facilitated by TWRI personnel. Traditional approved native seed mix was utilized.
- g. TWRI personnel surveyed abandoned tank trail area and selected application sites that would best benefit from compost application. Each site was mapped using GIS technology and corresponding information was sent to each compost facility. Dairy manure compost will be spread in a strip type fashion at a 3 inch rate. Each facility's material will be independently applied to keep material separate. Due to terrain and limited space, statistical data between materials will not be collected. Rather, performance of composted material as a whole on ability to establish vegetation will be evaluated.
- h. TWRI continues to receive monthly updates from DMES program regarding status of program and quantity of material transported to compost facilities.

Additionally, TWRI received compost sales data from TCEQ through May. TWRI is in process of developing database of all manure transported and compost sold as result of project.

Task 2.3 Implement the strategic CEMP. The CEMP will provide educational outreach, technical assistance, and documented materials for compost producers and users. It will also provide for the direct marketing of composted manure. The CEMP will target both public entities and private citizens throughout the region.

The following actions have been completed during this reporting period:

- a. RAA continued with sales call effort and submitted list of interested entities to TWRI. TWRI sent promotional letter, compost literature and rebate information to all interested entities. Further, contact information for entities which expressed immediate interest were forwarded to compost facilities with anticipation that the compost facilities would independently pursue the compost sale.
- b. All identified entities were contacted and a final distribution list of entities who received information was sent to all composters on 8-11-04 and to TCEQ on 8-24-04. Additionally, for the benefit of the compost producers, those entities which expressed immediate interest were highlighted for emphasis.
- c. The following was reported by RAA as direct assistance to compost facilities
 - Evaluated compost blend formulations and discussed STA Program test analysis with O'Neals and Producers Compost.
 - Discussed potential sources of organic matter, as identified in the OM survey, with composters
 - Per request by Organic Residual Reclamation, provided technical assistance to City of Carrollton in application of compost on one of their athletic fields.
 - Discussed specific market leads (as a result of the sales call effort) with particular composters.

Task 2.4 TWRI will maintain project web site by incorporating new information from the project's success in year 2. Information added to the web site will include, but is not limited to the following: results of compost use in field trials and demonstration programs from year 2 of the RDDP; success stories of compost use as a result of the project; and recent technical information obtained from project activities in year 2.

The following actions have been completed during this reporting period:

- a. Internet user statistic tracked use of Project Website to continually increase during quarter 9. Unique visitors for the month of June was tracked at 96 visits and increased in July to 121 and in August to 131. Website usage continues to grow and TWRI feels the site is an efficient communication tool.

Task 3.1 Continue to provide TCEQ assistance with quality assurance activities by conducting at least 20 random site visits to monitor the beneficial uses of compost by

participating state and local government entities and assess the agencies' and users' implementation of suggested BMPs.

The following actions have been completed during this reporting period:

- a. Although final budget for Organic Matter Improvement Survey and Study proposal has not been finalized, RAA completed survey portion of proposal. Preliminary report and tabular results can be found in Exhibit A.
- b. TCE proposes to hire a technician at Stephenville to complete organic matter improvement study during the next quarter.

Task 3.2 Where existing guidance literature is lacking, reports of current and past field trials and result demonstration activities will be documented and published. All effective compost production and use aspects will be documented in draft case studies, cost analysis and effectiveness assessment reports.

The following actions have been completed during this reporting period:

- a. No progress to report at this time.

Task 3.3 Develop and submit annual and final joint reports of 'success stories' including assessment and feasibility of program strategies so that similar programs could develop from the provided outline.

The following actions have been completed during this reporting period:

- a. No progress to report at this time.

III. Related Issues/Current Problems and Favorable or Unusual Developments

While working diligently to develop and expand markets for composted material, project personnel continue to face the barrier of limited participation by compost producers. It is the goal of TCE and TWRI to provide compost producers with the tools necessary to effectively market their product and in doing so, establish a market which will sustain on private funds without government assistance.

IV. Conclusion/Projected Work for Next Quarter

The following will be accomplished during the coming quarter:

- a. Finalize plans and budget expenditures for project activities of final year.
- b. Complete application of material on Fort Hood to evaluate ability to establish vegetation on abandoned tank trails.
- c. Conduct organic matter improvement study at Stephenville, publish results and provide to RAA for economic analysis.
- d. Conduct follow-up contacts on municipal list to potentially further expand market.
- e. Continue to work closely with DMES and TCEQ personnel in tracking volumes of manure transported and compost sold for tracking results of project activities. .

Exhibit A

DRAFT

Organic Matter Survey Results and Report

Company	Residual	Volume	Char.	Price/Tip Fee	Current Status	Comments
City of Hewitt	brush chips	160 yds/yr	none	0	give away and compost for own use	contact him to discuss need, he is open to concept, no other city generators
City of Waco	yd debris	6000 tons/yr	none	0	give away and compost for own use	christianh@ci.waco.tx.us, do NOT contact hi until he has OK, Waco has lawsuit going against some dairy farmers-OK to call
City of Teague	brush chips	400 yds/yr	none	0	give away and compost for own use	contact him to discuss need, he is open to concept, no other city generators
City of Groesbeck	brush chips	200 yds/yr	none	0	give away and compost for own use	contact her to discuss need, he is open to concept, city and prison also have corrugated
City of Thorton	brush chips	??	none	0	just starting, will give away	this is first season with chipper, will raise issue with Council for their review
Limestone County Coop. Ext.	hay	n/a				very little produced, most bought
City of Marlin	brush chips	500 yds/yr	none	0	none, just piling up	contact him to discuss need, he is open to concept
City of West	brush chips	n/a	none	n/a		
City of Mart	brush chips	150+ yds/yr	none	0	burning most of it	contact her to arrange pick up, no other city generators
City of Lorena	brush chips	will call back				
City of Media	brush chips	not sure	none	0	give away and compost for own use	contact him to arrange pick up, no other city generators - would like to swap compost for chips
City of Morgan	brush chips	none				produce a small amount which they use
City of Robinson	brush chips	none			use and give away	nothing available
Texas Forestry Assoc.		unknown			sent e-mail with volume and timing needs	he is interested in trying to help

Cradick Lumber		none				generate tiny quantities which they just trash
Central Lumber		n/a				
Ken Jordon Shutter Mfg.	wood, sawdust	500 yds/yr	none	0	disposal	will give away to manure generators if they can provide him with a dumpster or other place to keep it
Dean Foods	none	none				
Altria Foods	none	none				
Jon Lin Corp.	onion skins	40,000#/day?				
West Pallet Co.	sawduct	not sure				would need to have a container placed there, creating lots of sawdust every day
TST College	chips	none			they use all for mulch	
Schrieber Foods	cardboard	6000+ #/wk	none	?	baling and disposing?	he will look into the possibility of giving it to our people, they will be expanding and have more in future
Fibergrate Composite Structures	cardboard	? Tons/yr	none	?	baling and recycling?	he will look into the possibility of giving it to our people, but he thinks that they receive \$\$ for it now
Lone Star Corrugated	cardboard	none			baling and recycling	getting paid for cardboard
Erath County Coop. Ext.	hay	none				very erratic, undependable supply, IF at all
Thelin Recycling		none				mortal ENEMY of Erath dairy guys
City of Benbrook		none				small residential community with no sources that she is aware of
City of Arlington		none				
Arlington Landfill	ground brush	80,000 yds now, 10,000/yr	none	\$2/yd asking price	claims to be selling	has large stockpile now, and annual supply, he wants to sell it
City of Burleson	brush	see below				

" "	Brush /compost	about 30,000 yds/yr	4" - 6"			city makes and gives away yd trimming compost but has surplus, contractor grinds and removes
SMS Woodstone		LOTS				
SMS Woodstone	brush	LOTS	4" - 6"	0	mostly give away to variety of users	wood grinding company @\$.30-\$1.70/yd to grind, grind about 3.75MM yds/yr
City of Cleburne	brush	see below				
" "	brush	10,000 yds now	2"-5"	0	resident giveaway	double grinds for resident giveaway now, has large stockpile of larger material on site and available
City of Cross Plains		none				
Potter Game Tables	sawdust & scraps	15 yds,yr+	dust and scraps	0	disposal	has both sawdust and undefined quantity of natural wood scraps from furniture business
City of Dallas		maybe at landfill				
City of Duncanville	brush+	avg. 80 yds/wk	none	0	resident giveaway and living earth tech.	also 2 cabinet makers in town with large waste wood supply, send him an e-mail and he will coordinate
City of Euless		none				
Dallas City landfill	brush & chips	70,000 tons/yr	none	pay .93/yd to grind	use for road stabilization	would probably only offer unground waste, contains about 5% inerts
		60,000 yds/yr				
Trinity Waste	6 landfills					
" "		None, EXCEPT contaminated				lots of waste BUT NO source separation in Texas, ALL waste is co-mingled MSW
Council of Governments		none				thinks we are on right track and has no easier, faster way to go about carbon search
City of Ft. Worth	yd waste/ brush	20,000 tons++	none	0	some giveaway, ed.shumpert@fortworthgov.org	has 20,000 tons, ground and available NOW from a storm clean up, has 100 tons/wk year around

Abitibi Paper						handles all paper recycling for Ft. Worth
Supreme Corp.	cardboard?	call 8/16				
Dr. Pepper						
TX Institute of Applied Env. Res.	see EPA	none			beran@tiaer.tarleton.edu	
Trinity River Authority		No Waste or Info.				
TXU Electric Delivery Company	chips	300+ /day	none	0	giving away, disposal	has been contacted by Paul Fagan from Organic Reclamation (STA memembr) and trying to work with him,
						have 20-30 private locations that they store chips at, NO loading ability unless private sites can do
City of Granbury						
City of Grand Prairie						
City of Irving		left message				
City of N. Richland Hills		left message				
City of Stephenville	yd waste/ brush	2 tls/wk	none	0	used to giveaway to composter who went out of business	pay to have it ground about 1/yr, pretty cean, open to connecting with manure folks
City of Waxachie						
City of Weatherford	brush	350 yds/yr	none	0	local giveaway	would be interested in Erath project
Hamilton County Recycling		left message				
Central Texas Corrugated	corrugated	left message				
EPA Region 6		left message				

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Date: October 5, 2004

**To: TWRI and TCEQ Staff
From: Ron Alexander**

RE: Organic Matter Survey – Draft Report

Organic Matter Identification and Quantification Survey

1.0 Introduction

The dairy farmers located in the Bosque River Watershed (Erath County) are working with area composters, under the direction from TCEQ, to transform their manure into compost. This effort is ensuing in an effort to alleviate surface water impairments associated with excessive levels of nitrogen and phosphorus entering the watershed. These compounds, after composting, are much less available to leaching and run off, as more complex and less soluble forms are created. Further, a goal of the composting initiative is to raise the value of the manure, allowing it to be transported out of the impacted watershed. The majority of the manure being obtained for composting, however, is low in organic matter and high in pH, calcium and sodium. The finished composts possess similar characteristics, and have a high bulk density. These characteristics make the products less desirable for TxDOT usage and more expensive to ship.

It has been determined that the addition of organic matter, especially carbon rich sources, to the dairy manure compost can modify product characteristics, thereby improving its potential marketability. This should also assist composters in producing a finished compost product that will meet TxDOT compost specifications. Meeting TxDOT compost specifications would be an obvious benefit for the compost producers in the impacted watersheds as TxDOT is currently the largest user (specifier) of compost in Texas. Unfortunately, few large sources of organic matter (or carbon rich bulking agents) have been identified locally or regionally, and those that have been identified, have been somewhat costly.

As part of its contract through Texas A&M University, R. Alexander Associates, Inc. (RAA) was tasked to conduct a survey of potential public and private sources of organic matter. The impacted compost producers have expressed concern about paying for sources of organic matter (carbon), and remaining competitive with other composters in the State. Therefore, sources of recycled materials from both the public and private sectors were sought out, as an alternative to just purchasing products like commercially available sawdust and wood chips. It was hoped that an adequate supply of 'waste' carbon could be identified which may address two existing challenges: one for the 'generator' of the carbon waste and one for the composters. Specifically, it was hoped that compost producers could find materials available for a minimal fee (cost of transportation) or even better, receive a fee for management of the 'waste' carbon.

2.0 Methods

The surveying efforts encompassed an area approximately 50 miles in diameter, with Stephenville being the central point and a radius extending an approximate distance of 25 miles in all directions. It was estimated that anything located within this circle would pose minimal transportation challenges from both expense and logistical perspectives. Potential sources of high carbon organic matter or carbon rich by-products were sought out, quantified and evaluated for economic feasibility.

Various organic by-products sought included, but were not limited to:

- Yard waste, wood waste
- Tree trimmings, wood chips
- Sawdust
- Agricultural by-products (cotton burrs, rice hulls, spoiled hay, peanut hulls)
- Paper, cardboard

RAA utilized a variety of sources to create a contact list of possible generators and/or suppliers of this carbonaceous material. These included:

- municipalities who purchased wood chippers through solid waste grant programs
- city and county recycling officials
- other municipal officials
- county agricultural agents
- city chamber of commerce business lists
- referrals from those listed above, and other sources

The survey was conducted through telephone contact, but also included E-mail contact when requested by the prospect. The project duration was approximately 4 weeks, and took place primarily during the month of August 2004. The findings of the survey are listed in this report, and in the attached spreadsheet files.

Since several composters are already purchasing a variety of bulking agents to add to their compost, we did not concentrate on identifying additional sources of material that would have to be purchased. Up to now, Erath composters have purchased sawdust, wood chips and shavings, cotton burrs and peanut hulls in an effort to increase their organic matter content and reduce their pH. These materials possess a cost ranging from \$2.00 cubic yard (just the cost of delivery) to \$31.00 to \$55.00 cubic yard delivered. Other materials such as push down feed and spoiled hay have also been obtained, when available, typically for the cost of transportation.

2.1 Projects Tasks

The following tasks were completed during the project:

Task 1: Develop contact list to utilize during organic matter material survey.

Concentrate on municipalities, major employers and manufacturers producing such by-products and supplement the list with contacts from regional cities and counties (as well as their contractors).

Task 2: Conduct survey to identify organic matter material available within the Bosque River Watershed.

Data will be uniformly collected using a standard survey form in order to obtain valuable qualitative and quantitative data. Data collection will also identify the most easily accessible organic by-product sources, volumes, their general characteristics, seasonality of generation, price/tip fee to be paid, etc. Survey will be completed through the telephone, and samples of viable by-products will be obtained for verification.

Task 3: Target specific suppliers or organic matter materials.

Criteria include specific entities, which 1) are willing to pay a tip fee for the management of these materials, thereby generating additional revenues for the composters, or 2) can provide already sized reduced material (chipped, shredded, ground), thereby offsetting any related processing costs.

Task 4: Establish economic analysis of collected data.

Develop economic data for materials identified including available inventory and projected supply, potential cost of these additional bulking agents or the revenue generated by their management and transportation costs associated with each type. Realizing the difficulty of accurately determining this information, an attempt to analyze economic data will be made following the second phase of the Organic Matter Improvement Study when proper blending ratios are determined.

3.0 Survey Findings

The prospects were all initially contacted by telephone, in relatively random order. The initial key limiting factor determining prospect viability was their distance from Stephenville. They were asked a series of questions in an attempt to; determine if they generated any organic matter rich materials, define the type of materials they generated, determine the available quantity, determine the value, if any, that they assigned to the material, and other related questions. A copy of the survey questionnaire is included in this report as Exhibit 1.

A mix of both public and private entities was contacted based on the list of potential generators defined above. A total of 72 prospects were defined and contacted during the survey. This consisted of 43 municipal contacts (city, county, state and federal) and 29 private industry contacts. There are two types of available sources of materials available. There are 'stockpiled' supplies, that are available immediately, and there are 'ongoing' sources available throughout the year. The stockpiled sources are the result of periods of normal by-product collection and product stockpiling that resulted primarily from the generators inability to distribute the material, and also acute stockpiling situations that resulted from heavy spring storm clean up projects in the area. Most of these materials are yard debris, such as brush and tree trimmings. The ongoing production is, as the name implies, produced on a predictable basis throughout the year. This should be a consistent source of material for the composters once they develop a business arrangement with the generator.

3.1 Material Specifications

The vast majority material identified was in the form of shredded brush, generated by municipalities. Almost no supplier could give very specific specifications other than "the material had been run through a grinder". A size range of 2- to 5-inch was given by the City of Cleburne and 4- to 6-inch by SMS Woodstone and the City of Burleson. No other producers were able to give specific size or chemical specifications.

All of the municipal producers indicated that their material had a small level of contamination that ranged from a low of 1 percent and up to 5 percent. Most reported their materials having the lesser percentage of contamination. This contamination was claimed to be primarily film plastic, resulting from the trash bags used to collect the leaves and smaller brush, but there is also likely to be an assorted collection of some larger man-made debris contained in most of the stockpiles.

3.2 Quantity

Most of the contacts could only estimate the quantity of material that currently is or will be available. They were asked to take their best, conservative guess during the survey. Some of the estimates were given in a weight (tons) estimate and others were provided in volume (cubic yards). A ratio of 2 cubic yards equals 1 ton was used to standardize results in calculating the data totals listed below. This is a conservative figure, even for yard debris which is ground and aged to some degree. Therefore, even greater volumes are likely available.

Some key supply prospects are listed below, with their estimated quantities. These contacts were all passed along to the composters, TX A&M and TCEQ. In some cases, the composters were provided the contacts as soon as they were identified. This occurred when a need for urgent action was expressed by the generator of the material. The complete survey spreadsheet, with all contact information, is included in this report as Exhibit 2.

V. Major Generators*

Stockpiled Supply - Immediate Availability

City of Irving	'1,000s' of cubic yards (5,000 used for summary)
City of Fort Worth	40,000 cubic yards
City of Cleburne	10,000 cubic yards
City of Arlington landfill	80,000 cubic yards
TOTAL	135,000 cubic yards

Ongoing Annual Supply

City of Waco	12,000 cubic yards
City of Burleson	30,000 cubic yards
City of Arlington landfill	10,000 cubic yards
City of Dallas	60,000 cubic yards
City of Fort Worth	10,000 cubic yards
TXU Electric Company	75,000 cubic yards
Assorted other suppliers	21,000 cubic yards
TOTAL	218,000 cubic yards

*all figures are estimates

3.3 Financial Considerations

The vast majority of the municipal generators, as well as the TXU Electric Company, were more than willing to just have their material taken off their hands at no charge. It is a nuisance and a problem for them and for the most part would like to arrange a permanent and ongoing removal of it from their property. There were a few suppliers, however, who were either hinting at or asking to be paid something for the material. Some of the generators were obviously looking to offset the cost of grinding. Others may just be posturing or negotiating and will, in reality, also be satisfied to have the material removed from their sites at no charge. It will ultimately be up to the composters to negotiate the best possible arrangement. Perhaps one or more of the composters should even consider soliciting one of the larger generators for a yard debris management contract. In this scenario, they would set up a grinder at the generators location, then ship the ground product down to their Erath county location.

The City of Arlington landfill, as an example, has a supply in both categories above. They are asking \$2/cubic yard for this material. This seems unusual since they appear to have a significant excess which they would like to have removed. They also claim to be selling it. Several of the producers claimed to be using part of their production locally as mulch or, in one case, as a road stabilization base. Most of the municipal producers also had established public give-away programs for their residents. None of these self-use programs, however, seemed to be absorbing the total production of a facility in any but the smallest municipal producers.

3.4 Potential Challenges

Like any business arrangement, there will always be potential challenges or barriers to implementing a new program. A list of some of these potential challenges is listed below.

3.4.1 Contamination

All of the municipal generators indicated that there was a level of contamination in their product. This consists primarily of film plastic from bags used by residents to collect and store the material. A few also indicated that some larger piece of debris (e.g. furniture pieces, auto debris, etc.) might

occasionally be included in the material. If the composters were to accept this material, we assume that a waste management license may also be required.

Additionally, the risk for chemical contamination has also been addressed by some of the compost producers. Particular herbicides present in yard-wastes have been proven to persist in composted material and could pose a threat to producers who sell their material for landscape or greenhouse type uses. While this threat does not affect all uses of compost, it is difficult to test carbon material for presence of herbicide. Therefore, some compost producers are not willing to any source of 'waste' carbon.

3.4.2 Sizing

The composters should be able to receive all of the carbon rich materials after it has been shredded. There will, however, be some inconsistency in the sizes, as different generators will use different size screens on their shredding equipment. As would be expected, some of the generators actually contract out the shredding service to private contractors.

It may ultimately be advantageous for some of the composters to accept un-shredded waste to offset the cost of shredding incurred by the generators, and perhaps offer a new service to the industry. The composters would likely need to grind the materials at a site closer to where it is generated or concentrated in order to reduce ultimate transportation costs. This type of scenario would also allow the composters to have a better control of the size of the materials they obtain. This opportunity can only be determined on a case by case basis after the composters make contact with the individual generators, determine material availability and investigate the financial implications of accepting the material as shredded versus un-shredded.

3.4.3 Bidding laws

There was once a situation, with the City of Irving, where they were not permitted under City *law* to give material away to a private entity. They were permitted, however, to make such arrangements with either another municipality or with a state agency. These same rules exist if a City is interested in having a private firm manage their by-products for a fee. Therefore, if a composter wanted to obtain a source of material, especially with a larger community, they would likely have to go through a bidding process.

3.4.5 Truck loading

The largest, and perhaps best source of wood waste that was identified was the TXU Electric Company. They operate 20-30 small sites throughout the area in question and produce a regular supply of very clean waste wood. They typically make arrangements with private landowners to stockpile the material, but could not guarantee that there would necessarily be any equipment at these private sites to load the trucks if the composters wanted to obtain it. This situation, like all of the potential generators, will need to be specifically reviewed and addressed. The essential key is the willingness on the part of TXU to cooperate and provide the material.

3.4.6 Dumpsters

There were a couple of the private industry wood waste generators who expressed an interest in cooperating, but indicated the need for either a dumpster or a container of some kind be left at their site to collect the wood scraps and/or sawdust. This is certainly a possibility, but would also require the composters to possess a truck that can haul a roll off container.

4.0 Conclusions and Recommendations

It is the opinion of RAA that a fairly significant supply of very usable, carbon rich waste material exists within a reasonable distance of Erath County. With this said, of course, transportation costs should not be just dismissed. Regional generators should be able to assist with fulfilling both an immediate and longer term requirements of the composters. The composters would, however, need to complete the due diligence in order to assure that:

- quality of the 'waste' or by-product meets their requirements,
- specific site challenges or licensing issues can be addressed and solved,
- a mutually agreeable financial arrangement can be made, and
- the transportation logistics are mutually agreeable and cost effective.

A specific, recommended plan of action for the composters is as follows:

1. Review the attached spreadsheet and determine which generators produce the type and volume of material they require.
2. Consider transportation options and costs to determine if the location of the material is within a manageable distance.
3. Contact every supplier on the list who appears to have available material and arrange to visit the site and evaluate the material firsthand. We believe that this is critical, as opposed to just requesting a sample in the mail. It will give the best sense of product quality, site truck loading needs, material contamination, etc.
4. Concentrate on those perspective generators identified above as 'immediate' first. They may make other arrangements if the composters do not act in a timely fashion.
5. Review some of the specific challenges listed above and be prepared to address them. Some of the larger generators have presented these and they must be solved in a mutually agreeable way.
6. Make sure the composting site is prepared to accept large quantities of material in a convenient and efficient manner, so as not to hinder either the truck unloading or the composting operation activities. Consider licensing and permitting requirements. This can be easily accomplished by contacting the TCEQ.
7. Keep looking for additional sources. The composters may well find additional sources of material after they get established with the sources identified in this report.

Exhibit 1

ORGANIC BY-PRODUCTS QUESTIONNAIRE

Date: _____

1. **Company** _____

2. **Location** _____

3. **Contact and Title** _____

4. **Type(s) of Product Produced** _____

5. **Type of By-Products Generated (carbon/nitrogen based)** _____

6. **Amount of By-Product Produced (tpd/lypd)** _____

7. **By-product characteristics (particle size, pH, bulk density, OM content, WHC, moisture content, NPK). Send samples and chemical analysis.**

8. **Tip fee paid? Price paid for? (per ton or yard, picked-up, bulk vs. bagged, sliding scale)** _____

9. **Current distribution strategy (Major markets? Who uses? Product Literature? Advertise? Etc.)** _____

10. **Other comments** _____

