

Region V Solid Waste Management Assistance Grants Proposal

Organic By-products GIS Database Project

RATIONALE and PROJECT SUMMARY

Many economically important industries in Wisconsin generate large amounts of organic wastes annually. Such wastes are either land spread, land filled, or processed for other uses. In most cases, the potential for their beneficial reuse as soil amendments has not been realized. The recent report "A Study of the Future of Solid Waste Management in Wisconsin: A Report to the Legislature" (WI Department of Natural Resources and Univ. of Wisconsin-Extension, January 2001), acknowledged that composting and other biodegradation processes have the potential to recycle more than 50% of all solid wastes generated in Wisconsin (approximately 5 million tons/yr.). In order to promote greater beneficial use of organic by-products, particularly as soil amendments, we will create an interactive, web-based GIS database of organic by-products and by-product processors in Wisconsin.

The clientele will be manufacturers (waste generators), waste processors (composters, etc.) and end users of organic by-products (farmers, landscape companies, departments of transportation, golf courses, parks/green spaces). We will provide information about types of organic wastes, their biophysical characteristics, current modes of disposal, times of availability, hauling/transportation costs, potential for blending with other by-products and suitability for use as soil amendments (either in unprocessed or processed forms).

The goal of the ***Organic By-products GIS Database Project*** is to provide generators and users with geo-referenced web-based information to facilitate the beneficial re-use of materials that are otherwise considered wastes. The website will foster exchange of information among organic by-product generators processors, and end users. Ultimately, this type of information and materials exchange will reduce land filling and improper land disposal of these organic materials.

A preliminary outcome of equal importance will be creating the database itself. Waste streams of organic by-products in Wisconsin are not currently well understood or catalogued, yet they are a major source of landfill materials. This project would allow us to characterize the **types of** organic wastes generated in industrial, municipal and agricultural sectors, estimate **amounts of** organic wastes generated in Wisconsin, determine the seasonality of their generation, track the fate of these waste streams, document the bio-physical characteristics of these wastes and establish potential **markets** for the **beneficial reuse** of organic by-products.

Waste streams to be included in the database are:

- ◆ Biosolids from POTWs
- ◆ Yard debris (from municipalities)

- ◆ Cheese manufacturing residuals
- ◆ Animal manures (from large concentrated animal feeding operations)
- ◆ Cannery wastes
- ◆ Meat processing wastes
- ◆ Wood lumber mill wastes
- ◆ Paper mill residuals
- ◆ Tannery wastes
- ◆ Other food processing wastes

The ***Organic By-products GIS Database Project*** will be conducted in concert with the Fox River Valley Organics Recycling project (FRVOR). This integrated waste management project is attempting to collectively process diverse organic wastes into soil amendments. One component of the FRVOR project involves tracking all wastes in a “wasteshed” (50 mile radius) around Appleton, Wisconsin. These wastes will be processed into marketable soil amendment products. We will use the wasteshed around Appleton Wisconsin as a test case for creating the database, which can be expanded to create a database for the entire state, should additional funding become available.

The success of this project will depend heavily on business and industry support. Some industries will be reluctant to provide this information if they know it will be available for public viewing. We plan to overcome this potential obstacle by providing a high level of confidentiality. In addition, we will populate our preliminary geo-referenced web-based data set with companies involved in the FRVOR project as well as companies who have demonstrated an interest in environmental issues. Having these companies voluntarily include their by-product information on line should set an example for other industries and encourage their participation in the project. Companies involved in FRVOR include:

City of Appleton (Wastewater and Public Works Divisions)
 City of New London (Department of Public Works)
 American Foods (Meat processor)
 Tinedale Farms (Large dairy farm with anaerobic digester)
 Agrilink Foods (Vegetable processor)
 Hillshire Farms (Meat processor)
 D.C. Wiegman Inc, BioResource Products, LLC (Landscape nursery, composter)

Specific steps in the ***Organics by-products database*** project include:

- 1) Identify companies in the Fox River Valley wasteshed (four-county area) that generate organic by-products.
- 2) Identify companies with environmentally friendly records.
- 3) Conduct surveys to gather information about amounts of organic wastes generated and when, current fates (land filling, land application), current permits they hold, interest in finding other outlets for their organic wastes.
- 4) Obtain samples of by-products and test them to determine their physical, chemical and biological characteristics.

- 5) Create a GIS database of the organic wastes incorporating the information listed above.
- 6) Integrate the GIS database with our by-products web site. Develop query questions that web visitors can use to obtain information they need.
- 7) Construct a complete educational web site about soil amendments and composting that includes the by-products database and provides beneficial use case studies (this activity is already in progress).
- 8) Expand the survey and database for the state of Wisconsin (with additional funding).

MEASUREMENT PLANS

Step 1 has largely been completed through the use of Harris Info database information about manufacturers in the state of Wisconsin. This database is organized by SIC codes, so we can identify manufacturers by type and then sort by location using zip codes. The WI Dept. of Natural Resources and the state's wastewater treatment facility operator's association have collected information about municipal wastewater treatment residuals for the state. The WI DNR also has information about permitted large-scale livestock facilities (CAFOs) including number of cattle and manure management plans. We will have to fill in some of the gaps by talking with other livestock producers (large but not permitted as CAFOs). Steps 2-4 are largely not completed, and we plan to accomplish these tasks by developing a survey instrument (Phil Wells, Leslie Cooperband) and administering the survey through phone interviews (Jim Jacobus, UW-Soils Extension Outreach specialist) and some face-to-face interviews (Phil Wells). We will send samples to the UW Soil and Plant Analysis lab and the WI Hygiene lab for appropriate analyses on chemical (pH, conductivity, nutrients, organic matter content), physical (moisture content, bulk density, particle size) and biological (e.g. BOD5) analyses. Phil Wells (FRVOR project coordinator) has already begun to build the GIS database with help from Dr. Steve Ventura (Step 5). Step 7 is underway in that we have collected some information from the FRVOR feedstock suppliers on amounts of organic wastes, current fates, general chemical characteristics and handling costs. We have developed sample maps for cheese plants and CAFOs on the "WasteNOT organics webpage (www.wastenot-organics.wisc.edu).

We will likely be able to complete the GIS database and do sample analyses with the grant funds requested. We hope to begin the process of interfacing the database with the WasteNOT organics website (Step 6), but this may require additional funds to complete. We plan to hire a web development consultant to assist with developing the interactive part of the website, so that users can make specific queries on the database and input their own data.

After we have collected and evaluated the data, and developed the by-products web site, we will use several strategies for quantifying the impacts of the project. As the ultimate goal of the project is to facilitate beneficial use of organic by-

products in Wisconsin, we will design a web-based survey for users to provide feedback on the usefulness of the database in stimulating migration to beneficial re-use. We will conduct follow up telephone surveys to assess how these exchanges have been facilitated and the web site will be designed to track the number of visits to each area of the web site for evaluating each area's interest.

We will offer incentives such as membership in a *Black Gold* club, to highlight a company's success in sharing, selling, or otherwise re-using materials that previously would have been considered "waste." These honorary awards will serve as case studies to document the success of the project. Following one year of an operational web page, we will meet with the members of the *Black Gold* club to conduct a focus group on improving the process.

PARTICIPANTS

Dr. Leslie Cooperband, Assistant Professor University of Wisconsin Soil Science Department

Phil Wells, FRVOR Project Coordinator

Jim Jacobus, UW-Extension Outreach Specialist/Web Page Designer.

Dr. Steve Ventura, Associate Professor Soil Science Dept. and Director of the Center for Mapping, UW-Madison