

WASTEMATTERS

The Energy and Waste Management Bureau — Iowa Department of Natural Resources

July 2003

what's in the BIN?

ECICOG study reveals the effectiveness of recycling programs in Iowa

A recent study challenges a common assumption that the choice of collection system alone will determine the success of a residential recycling program.

“Just choosing a system isn’t necessarily going to make a program effective. You need to consider a whole host of factors,” said Jennifer Ryan, solid waste planner with the East Central Iowa Council of Governments (ECICOG), which produced the study in consultation with DSM Environmental Services (DSM) of Ascutney, Vermont.

Funded by a \$100,000 DNR Solid Waste Alternatives Program grant, the study examines the effectiveness of recycling in nine ECICOG case-study communities: Belle Plaine, Cedar Rapids, Central City, Iowa City, Marion, Monticello, Traer, Vinton, and rural Iowa County.

Waste sorts, surveys, and focus groups measured the effectiveness of recycling education, participation rates, capture



BOB CASTELLINE • DNR

A recycling worker empties a bin. An ECICOG study, conducted with funds from DNR, examines the effectiveness of recycling programs in 10 eastern Iowa communities.

rates, and costs. Benchmark analyses compared ECICOG communities with other communities in the United States in which the consultants had collected data.

“The study is a wealth of information for ECICOG, but it’s also a great resource that other planners can use on collecting data and evaluating their own programs,” said Jeff Myrom, executive officer with the Energy and Waste Management Bureau.

What factors increase residential recycling?

A key finding was that “pay-as-you-throw” (PAYT), also known as “unit-based pricing” programs work — but not all are equal.

Several case study communities have different forms of PAYT systems. In some cases, residents may set out one or two bags before paying for additional bags of refuse. “Most households don’t generate

It seems that people’s knowledge of recycling was formed when they first heard about it, about ten years ago.

— Jennifer Ryan
ECICOG

more than two bags a week, so they aren’t even aware they are on a pay-as-you-throw system,” Ryan said. “Incentives to recycle are greater for residents who must pay for each bag set out.”

- Other factors that contribute to increased recycling include:
- Collection of garbage and recyclables on the same day every week
- Co-mingling all materials in recycling bins, rather than asking residents to set out paper, plastic, metal and other materials separately

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- Landfill bans
- Weekly versus less frequent collection of recyclables
- Higher levels of education spending per household

An unexpected finding from the focus groups was that, despite years of public education about what can and cannot be recycled, many residents were still confused.

“It seems that people’s knowledge of recycling was formed when they first heard about it, about ten years ago, and even with updates over the years, absorption of the new information isn’t always happening,” Ryan said. “We need to work harder on different education strategies.”

Planners were also surprised to learn that, in municipalities where households have access to both curbside and drop-off systems, the majority (67 percent) of drop-off users also have curbside programs that collect many of the same recyclables at no cost. In the case of Iowa City, drop-offs were perceived by some residents to be easier to use than curbside because of stringent set-out requirements for curbside. In other communities, some residents said that storing recyclables was a problem and that the drop-offs accept a wider range of material.

As expected, communities that provide curbside recycling and education materials capture more recyclable material than those served by drop-off, but also have higher per household costs. However when you include the cost of driving to the drop-off to recycle, costs of drop off programs can equal or exceed the cost of curbside recycling programs.

“Communities have to decide what’s more important 3/4 diverting

Under study

Communities observed for the ECICIG case study

Municipality	County	Population	Households	Recycling Program Type
Belle Plaine	Benton	2,878	1,212	Drop-off
Cedar Rapids	Linn	120,758	49,820	Curbside, PAYT, drop-off
Central City	Linn	1,157	490	Curbside
Iowa City	Johnson	62,220	25,202	Curbside, PAYT, drop-off
Marion	Linn	26,294	10,458	Curbside, PAYT, drop-off
Monticello	Jones	3,607	1,538	Curbside, PAYT
Traer	Tama	1,594	686	Drop-off
Vinton	Benton	5,102	2,116	Drop-off
Rural Iowa county	Iowa	N/A	N/A	Voluntary subscription

materials from landfills or keeping short-term costs down,” said Marie DeVries, ECICOG solid waste planning coordinator.

How do case-study communities compare nationally?

To answer this question, DSM compared ECICOG case-study communities to other U.S. communities for which DSM had recently collected similar data, using the same methodologies.

In summarizing the results, Natalie Starr, DSM senior associate, said, “Recovery rates by material (in ECICOG communities) are some of the highest we’ve seen in the country. Costs are more along the average of what we’ve seen, and pounds recycled per household are a little lower than average. However, this may be because Iowa households generate less recyclable material to begin with.”

In response to why tonnages recycled have declined in case study communities during the past two years, while participation rates remain high, DeVries said, “We can only speculate. The economy is always a factor. The less people buy, the fewer

Participation rates

By community for the ECICIG case study

Municipality	Households Served	Households Participating	Participation Rate
Cedar Rapids			
Route 56	577	545	94%
Route 55	761	658	86%
Route 50	1,400	565	40%
Marion	504	442	88%
Iowa City			
Tues. Route	474	324	68%
Wed. Route	521	357	69%
North Liberty	250	205	82%
Central City	312	187	60%
Belle Plaine			38%

the recyclables. It may look like a bad thing, but what we may have now is waste reduction, which is actually higher on the waste management hierarchy than recycling.”

The 2003 study, “Evaluation of Recycling Programs: East Central Iowa Council of Governments, contains many other findings that can benefit Iowa planners and is available on-line at www.state.ia.us/dnr/organiza/wmad. For information, contact Marie DeVries at (319) 365-9941, Ext. 26 or by e-mail at mdecicog@inav.net.

WHO DOES? WHO DOESN'T? Some factors influencing participation rates for recycling:

- Multi-family dwellings have less access to curbside programs, so they recycle less frequently.
- People required to separate recyclables participate less frequently.
- People whose recyclables are picked up on a different day than their garbage participate less frequently.



All eyes on Iowa

USA watches, waits as DNR develops new rules for electronics waste

According to the song, if you can make it in New York, “you can make it anywhere.” In other tunes, a person in the City of Big Shoulders might say Chicago is “my kind of town,” and San Franciscans wear “flowers in their hair.”

But the top players in the world of electronics waste (E-waste) are singing a different tune. All eyes are on “the fairest state in all the west,” as Iowa works to develop rules for E-waste recyclers.

If all goes according to plan, the Department of Natural Resources will submit the proposed rules to the state’s Environmental Protection Committee in August, with the rules taking effect early in 2004. Iowa would be the first U.S. state to enact legislated rules for E-waste recyclers.

Merry Rankin, a DNR environmental specialist and project lead for the DNR’s E-waste recycling efforts, said that while some states have banned certain electronic components from their landfills, none have completed the loop and enacted rules to facilitate a sustainable infrastructure and level playing field for electronics recyclers. Rankin, who has served for more than two years on the National Electronics Product Stewardship Initiative (NEPSI) committee, said other states are taking notice.

“Other states have commented that Iowa is going about this in a very logical manner, which is to develop the infrastructure before taking further action,” Rankin said. “States that have banned electronic components from the landfill have found it to be a challenge to develop a sustainable infrastructure after the fact.”

The processing of E-waste has been a growing concern nationwide and in Iowa. E-waste poses problems not only because of the increasing volume being sent to landfills, but also because of potential environmental concerns. The glass used in computer monitors and television sets contains lead - as much as 5-7 pounds in a single monitor - while other heavy metals are found in a variety of electronic components. All these heavy metals can contaminate groundwater and pose other environmental and health risks if disposed improperly.

The proposed rules, developed with input from a multi-stakeholder advisory committee, feature provisions similar to those covering appliance demanufacturing (found in Chapter 118 of the Iowa Administrative Code). Some of those provisions include:



BOB CASTELLINE • DNR

The DNR’s Teresa Stiner unloads a monitor at the agency’s recent schools E-waste collection event in Hiawatha. More than 100 tons of E-waste were recycled.

- Registration and permitting of electronics recyclers
- Specific operational requirements based on recycling activities that will be completed within the facility
- A training and certification program for electronics recyclers
- Requirements for electronics recyclers to document and provide recycling information to the State of Iowa; having this information will help the state track the sources of E-waste, monitor the amount of E-waste generated and assist in the event of liability tracking.

Rankin said the proposed rules will facilitate a responsible and sustainable infrastructure for electronics recycling.

“It rewards responsible, conscientious recyclers,” Rankin said. “It also provides some direction and encourages forethought by new recyclers who are interested in entering the realm of electronics recycling. And it maintains an even playing field from a competitive standpoint.”

In addition to the proposed rules, the DNR will submit a strategic report, which is designed to be a policy recommendations document. The strategic report will provide guidelines for recommended thought processes as rules are developed or revised.

The proposed rules were developed as a result of legislative mandate in 2001 to deal with the growing problem of electronics waste.

“E-waste is a priority of ours, but we didn’t drive the formulation of these rules,” Rankin said. “This initiative shows a tremendous amount of proactive thought by the Legislature.”

For more information, contact Merry Rankin at (515) 281-0879, or by e-mail at merry.rankin@dnr.state.ia.us.

IN THE SPOTLIGHT:
As of June 2003, 26 states had introduced a total of 52 bills that would force electronics recycling in some way. The bills range from studies to landfill bans to complete takeback requirements by manufacturers. Iowa is working to establish sound rules and strategies before introducing legislation.

NO CRTs ALLOWED:
Currently, four states ban the disposal of cathode ray tubes (computer monitors and TVs) from their landfills:

- California
- Massachusetts
- Maine
- Minnesota



From LUST to loam

Landfarming helps remediate petroleum-contaminated soil

ON THE PLUS SIDE:

- Some advantages of landfarming:
- Simple
 - Short treatment times
 - Cost competitive
 - Effective on constituents with slow biodegradation rates

ON THE MINUS SIDE:

- Some disadvantages of landfarming:
- Difficult to completely eliminate contaminants
 - Presence of heavy metals may inhibit microbial growth
 - Requires large land area
 - Potential air quality concerns



Iowa ranks in the top three for agricultural production in the United States, so it's no surprise that the "land where the tall corn grows" is known throughout the world for its farming. But another commodity produced on the fields of Iowa might surprise you.

Clean dirt.

Landfarming, also known as land treatment or land application, is an above-ground technology that uses biodegradation to reduce the levels of petroleum constituents found in contaminated soil.

This contaminated soil, usually excavated from areas surrounding leaking underground petroleum storage tanks (LUST), is spread in a thin layer over a strategically located field and mixed with the upper few inches of topsoil. Microorganisms found in the soil — stimulated through aeration, energy from the sun, and the addition of minerals, nutrients and moisture — break down the petroleum contaminants. In time, the soil can safely support crop growth.

In other words, it's using nature to make clean dirt from contaminated soil.

While landfarming can be an effective remedy for contaminated soils, it also can cause problems for the environment if performed improperly. Trouble can occur if the contaminated soil is applied too thick, or if it's applied on slopes, near streams or near houses. Jeff Myrom, executive officer for the DNR's Energy and Waste Management Bureau, believes that Iowa's rules for landfarming need to be improved. He said the agency will soon update Iowa's rules



NRCS PHOTO

Landfarming involves spreading contaminated soil over a designated area, discing the soil, and allowing nature to remove petroleum contaminants naturally through biodegradation.

governing landfarming.

"We don't want to make this an unnecessarily complex process, but we need to get up to modern standards for landfarming," Myrom said. "There needs to be some more due diligence in making sure this is done right."

Steve Squires, regional manager at E-Farms Ames office, says proper landfarming considers a number of aspects.

"One of the most important factors is choosing the proper site for a landfarm," Squires said. "You also have to be diligent in your efforts to properly disc the soil and collect proper soil samples to demonstrate successful treatment. The goal is to remediate the soil and minimize the impact to the environment, not to add to the problem."

While improper application of contaminated soil can lead to environmental problems, prematurely placing the land back into crop production could threaten human health. Petroleum products generally contain more than 100 different constituents that possess a wide range of volatility, meaning the amount of time to biodegradation

can vary from six months to two years, depending upon the specific contaminants found in the soil.

Although nearly all constituents in petroleum products typically found at leaking underground storage tank sites are biodegradable, the more complex the molecular structure of the constituent, the more difficult, and less rapid, is biological treatment.

The process of rewriting the rules for landfarming is nearing the advisory committee stage where the Department reviews a draft chapter with stakeholders to help improve the clarity and effectiveness of final rule requirements.

Squires added that clearly defined rules are the key to compliance.

"If it's laid out so that requirements are defined specifically, it's easier for people to follow them," Squires said. "The most successful programs are those that are written so that people can understand the requirements."

For more information on the landfarming rules revision process, contact Jeff Myrom at (515) 281-3302.

Waste tire program gets new life

Legislation enacted in 2002 will allow Iowa to continue building upon the success of the original waste tire management program, which began in 1996 and expired in 2002.

Twenty percent of revenues from a \$5 surcharge on motor vehicle titles has been appropriated through June 2006 to fund enforcement and compliance, market development, public education, stockpile abatement, and public health initiatives related to waste tires. Due to statewide budget shortfalls, the first fiscal year of funding was transferred to the state's General Fund. Funding is anticipated to begin this July.

"It's possible to do more with less money now because we're able to use what we've learned and direct the flow of tires better, rather than just responding to the glut of stockpiles," said Mel Pins, DNR environmental specialist. Since 1997, more than 70 stockpiles containing more than 10 million tires have been cleaned up, processed, and marketed.

By law, about one-third of the appropriation will enable the department to continue to staff waste tire program administration, permitting, enforcement and compliance. "As other states have learned, even if you clean up the big stockpiles, you can't stop there and think the problem's solved," Pins said. "To avoid future problems, you need to keep up the enforcement."

Another third of the funds, allocated to market development, will be direct toward capital improvements for business expansions that will handle the ongoing flow of tires, and for the further expansion of end-user market capabilities.

With the money appropriated for public education and awareness (18 percent), the department will launch a statewide public relations campaign targeting waste tire generators, including tire dealers, businesses and the general public



BOB CASTELLINE • DNR



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With major stockpiles such as the former Grell stockpile (above) near Fort Dodge cleaned up, the DNR will now be able to concentrate on developing markets for scrap tire byproducts. Among the many uses for scrap tires is the production of high-performance athletic fields, which use crumb rubber as a base material. The football field at Simpson College (left) uses such technology.

The legislation allocates 15 percent of the funds for waste tire stockpile abatement, and requires a cost share from landowners. "Since we have very limited dollars, the department will look closely at any site requesting assistance and will not consider cleaning up tire sites created after 1991, when the waste tire ban took place,"

Pins said. Specific criteria for the initiative will be established in administrative rule.

The remaining funds will be used to work cooperatively with the Iowa Department of Public Health on issues related to waste tires and the West Nile virus.

For information, contact Mel Pins at (515) 281-8489 or by e-mail at mel.pins@dnr.state.ia.us.

WMA

SECOND LIFE FOR TIRES:

Waste tires have a number of market uses:

- Tire-derived fuel— Shredded tires are used as a fuel supplement in power plants and cement kilns.
- Crumb rubber— Finely ground tires are used for athletic track surfaces and horse arena footing material.
- Leachate systems— Shredded tires are placed at the bottom of newly constructed landfills to "filter" and collect the leachate.
- Whole tires— Used for racetrack crash barriers, tarp hold-down weights and other applications.

WE'RE LOOKING BETTER THAN EVER...



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DNR Leading Iowans in caring for our natural resources

DNR announces April SWAP recipients

WHO PAYS THE BILLS?

SWAP receives funding from the solid waste tonnage fee, which is a surcharge on nearly every ton landfilled in the state of Iowa.

April 2003 Projects funded through the Solid Waste Alternatives Program (SWAP):

- Midwest Sanitation of Pella received \$341,000 to improve and expand recycling operations targeting the commercial sector.
- \$170,000 was awarded to Koster Grain, Inc. of Carroll to manufacture and bag wood fuel pellets.
- Goodwill Industries of Central Iowa received \$82,665 to educate donors on responsible donating practices and deter illegal dumping at Goodwill stores across Iowa.
- \$71,400 was awarded to Ron Alexander Associates, Inc. of Apex, NC to conduct training efforts and workshops that assist Iowa's compost industry.
- Dayton Meat Products of Malcom received \$49,725 to purchase an in-vessel digester for composting of organic waste from its slaughterhouse.

- The City of Laurens received \$22,395 to implement cardboard and office paper recycling for businesses.
- \$20,000 was awarded to the Iowa Valley Community College District to create education materials for the Hispanic population of Marshall County.
- \$20,000 was awarded to the Clear Creek Amana School Foundation of Oxford to install a community playground area that includes recycled content surfacing material.
- The City of Algona received \$20,000 for the purchase of a compost screener to improve composting operations.
- \$20,000 was awarded to the Iowa Recycling Association to market recycled content paper as a state affiliate of the national Recycled Paper Purchasing Cooperative initiative.
- Tenco Industries of Ottumwa received \$19,495 to re-furbish

computers as part of a rehabilitation program for individuals with disabilities.

- \$19,246 was awarded to Benton County to implement county-wide curbside collection.
- Table to Table, Iowa City, received \$15,000 to expand their program, which collects edible but not sellable food and donates it to area shelters and other at risk groups.
- Vedic City received \$8,400 to implement drop off recycling for the residents of this newly incorporated city.
- \$6,500 was awarded to the University of Northern Iowa to distribute resources and administer waste-related service-learning projects in Iowa schools.
- Lakeside Recycling received \$2,696 to implement a commercial corrugated cardboard recycling program for businesses in Monroe County.



COMPLETE LIST:

For a complete list of DNR publications, visit www.iowadnr.com

DNR resource materials available for public use

Materials designed to educate on tires, autos, dumping

LEARNING TO MAKE A DIFFERENCE: Waste tire recycling instructional video

This 13 minute video, developed by the SEMCO solid waste planning area in conjunction with IDNR, is available for school teacher's and recycling educators at no charge. Helps to tell the story of what happens to old tires, and the dangers of improper storage and disposal. Great for children in grades 4-12, as well



as driver's education classes.

AUTO RECYCLING AND ENVIRONMENTAL AWARENESS: A Best Practices Guide

This guidebook has been prepared to help the auto recycler with on-site management practices of auto dismantling and waste recovery and handling. Gives auto recyclers options to help them minimize environmental impacts to air, land,



and water. Free copies as requested.

ILLEGAL DUMPING: How to Establish and Operate and Illegal Dumping Prevention and Response Program

This comprehensive guide for local governments was created to help cities and counties implement strategies in illegal dumping enforcement, prosecution, and community education efforts. Has tips to gain „buy-in“ from local government officials for their support and understanding of the issues posed by illegal dumping.



Changes improve DNR data collection

As a result of ongoing process improvements and assistance from the solid waste community, DNR's Energy and Waste Management Bureau has increased efficiency, improved data collection and significantly reduced review time for documents submitted by stakeholders.

Process changes in financial assurance plan submittal have already paid dividends to the department and landfill agencies.

Legislation enacted in 1987 requires landfills to follow financial assurance rules that ensure funding for landfill closure and post-closure costs. Originally designed to be self-enforcing, the rules were revised to require departmental review, starting with April, 2002 submittals.

When Program Planner Alex Moon transferred to the bureau in November, 63 financial assurance plans awaited review, and were approved this spring.

As he reviewed the documents, Moon noted that various interpretations of the requirements resulted in document revisions that were time-consuming for both the landfills and the department.

Assisted by other departmental staff, Moon worked with landfill agencies in developing a form to simplify and streamline the submittal process. In February, two workshops were held to explain the requirements and the new form to landfill agencies and consultants.

The success of these efforts became evident when the plans due this April arrived. Of the 60 submitted as of June 1, 53 have been approved - and more than 75 percent of them were turned around in about a week, compared to the year it took for last year's submittals.

Moon credits the success to cooperation among department staff and landfill agencies. „ISOSWO members were happy to help and had a lot of input,“ he said. „It was great to work with a collaborative group to make worthwhile changes.“

This success followed a series of process improvements in solid waste comprehensive plan guidance, submittal, and review, which were also driven by the department's stakeholders.

A two-and-one-half year process beginning in the fall of 1999 culminated in revised administrative rules that clarified the type of information required, and allowed for on-line submittal of the plans.

„Our goal was to streamline the process, develop consistency and receive the required information when the plans are first submitted,“ said Jane Mild, supervisor of the bureau's Planning, Permitting and Engineering Services Section. „We already saw quite an improvement in the plans submitted in July, 2001.“

About two-thirds of every plan is now submitted electronically, with average approval time reduced from 275 days to 66 days. The department strives to submit the first comment letter to planners within two weeks.

The bureau also is tackling ways to streamline and improve the solid waste permitting process. All aspects of the process, including work flow, tracking, turn-around time, and document format will be examined. A major goal is to cut turnaround time to 30 days.

Mild, who is spearheading the effort, encourages stakeholders' input, beginning with focus groups to be held this summer. „The goal won't be accomplished overnight, but we realize there are important issues we need to address, and we need to make sure that all parts of the system work together,“ she said.

Mild will bring to the table her experience working with the Air Quality Bureau, on the Business Process Improvement Team.

For information, contact Jane Mild at (515) 281-5105 or by e-mail at jane.mild@dnr.state.ia.us.



Solid waste customer meetings continue on ICN

The DNR's series of Solid Waste Customer Contact Meetings over the Iowa Communications Network (ICN) continues August 12.

The meetings are part of an ongoing effort to provide increased communication between DNR staff and stakeholders in the waste management industry.

Time for the meeting is 10 a.m. to

noon. Locations are as follows:

Spencer, Iowa Lakes Community College, Fiber Optic Room.

Des Moines, Iowa Workforce Development, 2nd Floor conference room.

Mason City, North Iowa Area Community College, Room 129, Careers Building.

Washington, National Guard.

Davenport Central High School, Annex Building.

Atlantic Public Library.

Manchester Public Library.

Sioux City, Public Library.

For more information or directions to the sites, contact Jane Mild at (515) 281-5105, or by e-mail at jane.mild@dnr.state.ia.us.



Iowa in pictures

A look at waste management issues around the state



TOP: Think illegal dumping only happens in rural areas? Think again. This photo was taken in Des Moines just a few blocks from the State Capitol building. The DNR has been working with local governments to help them establish programs to combat illegal dumping. For more information, contact Mel Pins at (515) 281-8489.

BOTTOM: The recycling of electronics waste has been a priority at the DNR for two years. The DNR recently partnered with Iowa school districts to recycle more than 100 tons of used electronics. In this photo, a volunteer removes components from a school bus. For more information, contact Merry Rankin at (515) 281-8263.



Photos by BOB CASTELLINE • DNR

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