

Product Stewardship

Overview

The Product Stewardship Institute (PSI) defines product stewardship as “the act of minimizing health, safety, environmental and social impacts and maximizing economic benefits of a product and its packaging throughout all lifecycle stages.” While often focused on manufacturers and producers it can also encompass distributor, retailers and consumers. Stewardship can be either voluntary or mandatory (e.g., required by law).

The PSI defines extended producer responsibility (EPR) as “a mandatory type of product stewardship that includes, at a minimum, the requirement that the producer’s responsibility for their product extends to post-consumer management of the product and its packaging. There are two related features of EPR policy: (1) shifting financial and management responsibility, with government oversight, upstream to the producer and away from the public sector; and (2) providing incentives to producers to incorporate environmental considerations in the design of their products and packaging.” Product stewardship initiatives focus on specific waste materials. It is widely used in Europe and Canada to support recycling and waste diversion.

In 2010, Keep Nebraska Beautiful, WasteCap Nebraska, the Nebraska League of Municipalities, the cities of Lincoln and Omaha, and the Product Stewardship Institute formed the Nebraska Product Stewardship Coalition (NPSC) with the mission of “shifting Nebraska’s waste management system from one focused on government funded and ratepayer financed waste diversion to one that relies on producer responsibility in order to reduce public costs and drive improvements in product design that promote environmental sustainability.”

Current Programs

Nebraska and the Planning Area are served or have access to several programs that represent basic principles of product stewardship and EPR; these are voluntary programs. According to the NPSC “current collection programs in the state for various materials do not fully reflect the product stewardship model because they do not share proportional responsibility with industry.”

Examples of available programs are mostly focused on toxic and difficult to manage materials. Further information on end-of-life and extended product life programs can be found in attachments to this technical paper, in the [Lincoln-Lancaster County’s Official 2012 Waste Reduction & Recycling Guide](#), and though the City’s Solid Waste Operations website <http://lincoln.ne.gov/city/pworks/waste/sldwaste/>. Some of these programs are directly supported by product manufacturers, while others are geared toward diversion without necessarily placing strong emphasis on manufacturer, distributor, or consumer responsibilities for waste reduction, resource conservation, environmental protection or societal changes. Also, for those materials managed through the City-County HHW programs they involve grant funding and thus are paid for through ratepayer/government financed programs.

Examples of spent products (wastes), often a part of product stewardship initiatives, that can be managed locally through various initiatives include:

- Electronics
- Batteries (automotive, rechargeable, button)
- Fluorescent lamps
- Paints
- Motor Oil

- Telephone Directories
- Other materials managed by household hazardous waste (HHW) collection events

Many of these are currently managed by private/business financed efforts and are voluntary in nature. Access to national resources for select materials is also available through organizations such as:

- Rechargeable Battery Recycling Corporation (aka Call2Recycle®)
- Corporation for Battery Recycling (for spent household batteries)
- End of Life Vehicle Solutions (for mercury from auto dismantlers)
- Thermostat Recycling Corporation

The City also addresses end-of-life management of appliances through its appliance de-manufacturing facility at the N48th Street Landfill, where mercury switches and PCB capacitors are removed from appliances before the metal components are recycled. Again, this is a government funded and ratepayer financed program.

State legislation (Nebraska's Integrated Solid Waste Management Act) attempts to provide the public and businesses some incentive for toxics reduction and proper waste management by banning certain materials from municipal waste landfills. This does not directly place the burden on manufacturer's and producer, and does not mandate recycling. The following items are banned by this act:

- Waste Tires
- Lead Acid Batteries
- Waste Oil
- Household Appliances
- Yard Waste (see exception below)
- Unregulated Hazardous Wastes

The legislation provides for seasonal and other exceptions for yard waste and does allow for landfills, such as the City's Bluff Road Landfill, to accept yard waste for disposal, because it could be used for the production and recovery of methane gas for use as fuel. Acceptance of yard waste at the City's Bluff Road Landfill would require approval from NDEQ and would not be applicable until the power generation facilities are complete in 2013.

Generation and Diversion

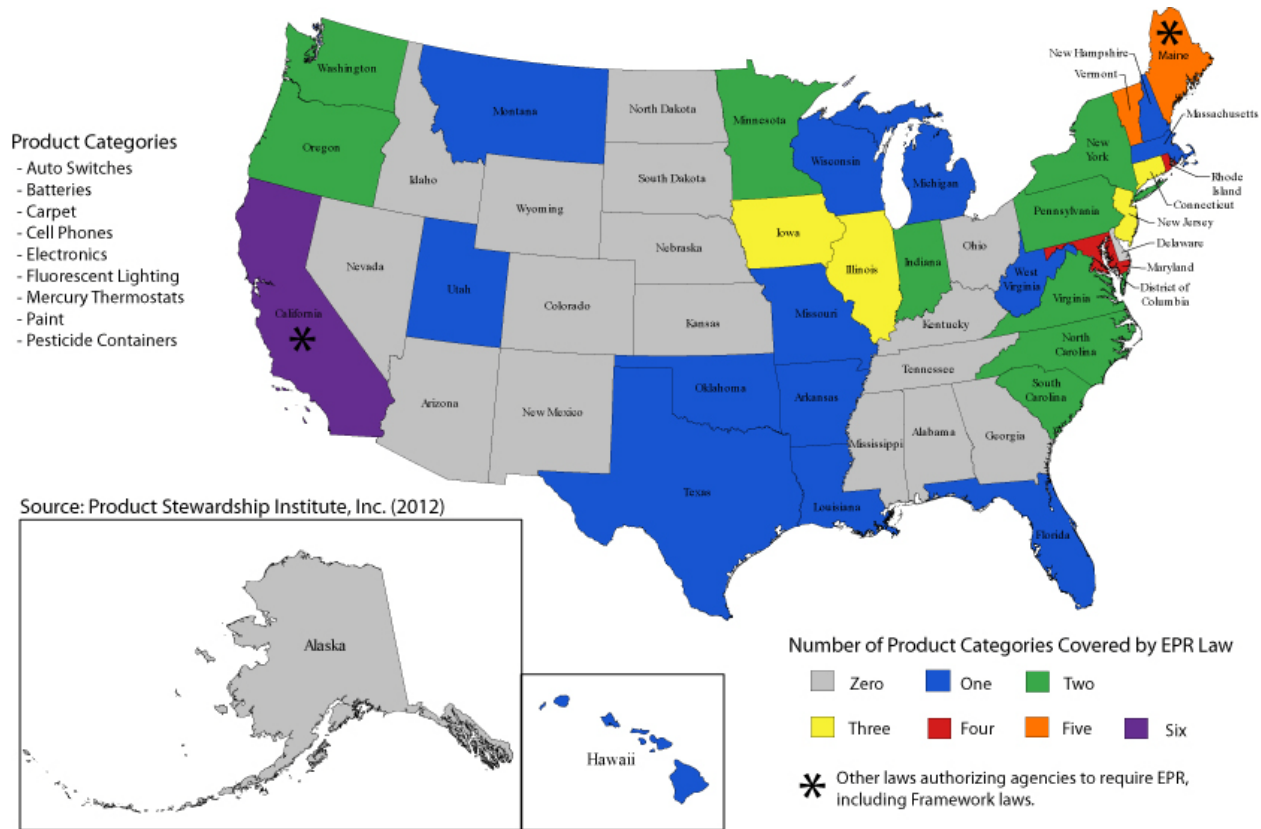
The NPSC notes in one of its publications that 42 percent of the over 2 million tons of material landfilled (including 7,550 tons of electronics) in Nebraska in 2010 is readily recyclable. This disposal represents a loss of not only recyclable materials but of finite resources such as metals and petroleum based products.

It is possible to promote product stewardship throughout the lifecycle of consumer products that focuses on reduction, reuse and recycling. Product stewardship and EPR programs in the U.S. have target post-consumer management of durable goods and potentially hazardous materials.

Program (Facility/System) Options

The application of product stewardship and EPR at a local (Planning Area) level may be difficult/challenging, because the nature of such programs, are often viewed as needing state or federal legislation. Figure 1 provides a summary of EPR laws by state.

Figure 1 – Extended Producer Responsibility Laws by State



Source: Product Stewardship Institute (Downloaded July 18, 2012)

Some examples of programs that have been implemented across the United States include:

- Take-Back Programs or Extended Producer Responsibility (See Figure 1)
- Bans on Certain Materials (including those in Nebraska) and Bans on the Toxic Components in Certain Materials (such as limits on Volatile Organic Compounds in paints or lead in fishing tackle)
- Deposit or Bottle Bill (Iowa)
- Paint Recycling/Take-Back (Rhode Island)
- Advanced Recycling Fees (California)

With the goal of reducing waste generation there are also programs such as pay-as-you-throw and volume based fee system, which will be discussed in separate technical papers. Such volume based fee programs may not truly be acts of product stewardship, but rather waste reduction incentive programs.

With the NPSC mission of shifting Nebraska's waste management system from one focused on government funded and ratepayer financed waste diversion to one that relies on producer responsibility it would appear one of the most effective means of implementing product stewardship and EPR (to the extent that they would be a part of the Solid Waste Plan 2040) would be to continue to support efforts of NPSC to integrate principles of environmental

stewardship into the policy and economic structures of Nebraska through support of educational initiatives and legislative changes.

While product stewardship is a much discussed topic in the waste management and environmental community, it generally needs top-down legislation of business and new environmental laws may create challenges for rapid implementation in Nebraska and at the federal level. Ongoing changes in environmental policy across the US have also been focused on material bans and prevention of inappropriate management practices (as has been occurring with certain electronics exported overseas for recycling).

Options Evaluation

As mentioned above, most of the options related to extended producer responsibility require state legislation, however local EPR options may be considered when analyzing management strategies for specific waste materials.

Three publications are attached to this paper; they provide additional information and opinions for further consideration. These include:

1. Nebraska Product Stewardship Coalitions Purpose Statement
2. Building Product Stewardship in Nebraska: Understanding Our Foundation, Nebraska Product Stewardship Initiative, November 2010
3. From Birth to Rebirth: Will Product Stewardship Save Resources, Chaz Miller, October 2011.

Consistent with the guiding evaluation criteria developed for use in the Solid Waste Plan 2040, product stewardship and EPR have been evaluated based on the following considerations:

- **Waste Reduction/Diversion:** product stewardship and EPR have the clear goals of reducing waste at the source, supporting recycling goals and diverting materials from disposal. The mechanisms proposed focus principally on product manufacturers/producers but extend across the entire spectrum of waste generators from distributors to consumers. They also include principles that serve to create markets for recovered materials.
- **Technical Requirements:** product stewardship and EPR would of necessity create added material recycling capacity to accommodate increased diversion for specific products. The extent to which such programs complement or are compatible with other local program elements would need to be further explored as specific programs are developed. The risks and uncertainties may also be more a function of the success of such programs in reducing costs to consumers and government; these cannot be precisely estimated or quantified at this time. As noted above, it is likely necessary for program to be developed at the state and federal level to ensure reliable performance and consistency across a wide spectrum of effective implementation and enforcement issues.
- **Environmental Impacts:** the definition of product stewardship states it is the act of minimizing health, safety, environmental and social impacts and maximizing economic benefits of a product and its packaging throughout all lifecycle stages. As programs and options are considered and support is recruited it may be necessary to further evaluate a given option to verify that it meets the following criteria:
 - Conservation of resources (materials and energy)
 - Air emissions (criteria pollutants, greenhouse gas)
 - Water quality impacts

- Reduction of toxicity
- Health and safety
- **Economic Impacts:** product stewardship and EPR can provide for an alternative financing mechanism for managing specific products at the local level. With product stewardship and the EPR models it would clearly be the manufacturer/producers responsibility to provide funding for major capital investments and establish funding mechanisms; some of these laws allow manufacturers/distributors to include advanced deposit or refund fees in initial product sales fees at the retail level. From a community perspective the manufacturer/producers investments may also provide local economic development and local market opportunities, with associated employment opportunities in the collection and processing of materials. These factors cannot be estimated or quantified at this time and must be analyzed in evaluating options for specific products.
- **Implementation Viability:** Implementation viability may largely be driven by legislated mandates and/or regulatory changes; again, these may be specific to materials managed and program structure. While the overall concept of stewardship and EPR are likely considered socially and politically acceptable the details of the program will ultimately determine the true acceptability. By emphasizing manufacturer responsibility and focusing on toxic materials it may be easier to gain wider support for initial program options.

Relationship to Guiding Principles and Goals

As it relates to the Guiding Principles and Goals of the Solid Waste Plan 2040, product stewardship would be applicable as further noted below:

- Emphasize the waste management hierarchy: product stewardship and EPR is directly related to the waste management hierarchy in that it places maximum emphasis on reduce, reuse, and recycle to avoid or prevent the need to generate and manage certain residuals.
- Encourage public/private partnerships: product stewardship and EPR requires participation by both public and private stakeholders, nationally, state-wide and locally.
- Ensure system capacity: product stewardship and EPR requires the necessary infrastructure and systems approaches to ensure that material will not be discarded and can be reused, recycled and returned to beneficial use. These concepts go well beyond the end of the line management (disposal) and would also require the creation of the infrastructure with the capacity to collect, transport and manage targeted materials.
- Engage the community: product stewardship and EPR will require an engaged community because it will likely require legislation at the state or local level.
- Embrace sustainable principles: product stewardship and EPR is based on sustainability principles in emphasizing minimizing health, safety, environmental and social impacts of a product and its packaging throughout all lifecycle stages of manufacturing, distribution, retailing and consumer.

Summary

Product stewardship and EPR focus on minimizing health, safety, environmental and social impacts and maximizing economic benefits of a product and its packaging throughout all lifecycle stages, in part by imposing requirements that extend the producer's responsibility for

their product to post-consumer management of the product and its packaging. Product stewardship can be either voluntary or mandatory and can serve as a mechanism to fund various waste reduction strategies.

There may be many challenges in attempting to shift waste management of specific products from a focus on government funded and ratepayer financed waste diversion to one that includes greater reliance on producer responsibility. It would appear that one of the most effective means of implementing product stewardship and EPR (to the extent that they would be a part of the Solid Waste Plan 2040) would be to continue to support efforts of NPSC to integrate principles of environmental stewardship into the policy and economic structures of Nebraska through support of educational initiatives and legislative changes. While product stewardship is a much discussed topic in the waste management and environmental community, it needs top-down legislation of business and development of new environmental laws at the local, state and/or at the federal level to realize its full potential.

APPENDICES

Nebraska Product Stewardship Coalition

Purpose Statement

May, 2012

The Nebraska Product Stewardship Coalition is a cooperative effort between non-profit organizations, municipalities, and the solid-waste management community to build product stewardship capacity and infrastructure in the state of Nebraska. The Coalition does not have an office, staff or budget. It relies on the volunteer contributions of Coalition members and their member agencies.

Membership in the Coalition shall occur when a representative of an organization agrees that its organization can be listed as participating in the Coalition. Actions of the Coalition shall be determined through a consensus of the Coalition members. Any Coalition member can participate in meetings and decisions of the Coalition.

MISSION STATEMENT

To shift Nebraska's product waste management system from one focused on government funded and ratepayer financed waste diversion to one that relies on producer responsibility in order to reduce public costs and drive improvements in product design that promote environmental sustainability. The Nebraska Product Stewardship Coalition works to integrate the principles of product stewardship into the policy and economic structures of Nebraska.

DEFINITION OF PRODUCT STEWARDSHIP AND EXTENDED PRODUCER RESPONSIBILITY

Product Stewardship is the act of minimizing health, safety, environmental and social impacts, and maximizing economic benefits of a product and its packaging throughout all lifecycle stages. The producer of the product has the greatest ability to minimize adverse impacts, but other stakeholders, such as suppliers, retailers, and consumers, also play a role. Stewardship can be either voluntary or required by law.

Extended Producer Responsibility (EPR) is a mandatory type of product stewardship that includes, at a minimum, the requirement that the producer's responsibility for their product extends to post-consumer management of that product and its packaging. There are two related features of EPR policy: (1) shifting financial and management responsibility, with government oversight, upstream to the producer and away from the public sector; and (2) providing incentives to producers to incorporate environmental considerations in the design of their products and packaging.

OBJECTIVES

The objectives of the Nebraska Product Stewardship Coalition are to:

- Develop and recommend product stewardship policies and educational tools to organizations, institutions, governments, and state legislators.
- Provide effective leadership on product stewardship initiatives in the state.
- Educate elected officials and other decision makers on the benefits of product stewardship.
- Provide a forum for the exchange of information regarding existing and proposed EPR programs.



PRODUCT STEWARDSHIP AND EXTENDED PRODUCER RESPONSIBILITY

Reducing Economic, Environmental, Health, and Safety Impacts from Consumer Products

The growing product stewardship movement in the United States seeks to ensure that those who design, manufacture, sell, and use consumer products take responsibility for reducing negative impacts to the economy, environment, public health, and worker safety. These impacts can occur throughout the lifecycle of a product and its packaging, and are associated with energy and materials consumption; waste generation; toxic substances; greenhouse gases; and other air and water emissions. In a product stewardship approach, manufacturers that design products and specify packaging have the greatest ability, and therefore greatest responsibility, to reduce these impacts by attempting to incorporate the full lifecycle costs in the cost of doing business.

The terms *product stewardship* and *extended producer responsibility (EPR)* are often used differently by stakeholders involved in the product stewardship movement. The purpose of this document is to harmonize terminology in the U.S. and to guide development of policies, legislation, and other initiatives by governments, companies, and organizations. By speaking the same language, we can have a constructive public discussion.

We use the following definitions for product stewardship and EPR. Since we define EPR as a legislative approach, we believe it requires further clarification and therefore developed the subsequent *Principles of Extended Producer Responsibility*.

Product Stewardship is the act of minimizing health, safety, environmental and social impacts, and maximizing economic benefits of a product and its packaging throughout all lifecycle stages. The producer of the product has the greatest ability to minimize adverse impacts, but other stakeholders, such as suppliers, retailers, and consumers, also play a role. Stewardship can be either voluntary or required by law.

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PRINCIPLES OF EXTENDED PRODUCER RESPONSIBILITY

The following EPR Principles include key elements that should be included in all EPR legislation. Although these Principles will be applied differently by different jurisdictions, they are aspirational and considered best practice to achieve maximum results.

- **Producer Responsibility**
 - Producers are required to design, manage, and finance programs for end-of-life management of their products and packaging as a condition of sale. These programs may or may not use existing collection and processing infrastructure. Programs should cover all products in a given category, including those from companies no longer in business and from companies that cannot be identified.
- **Level Playing Field**
 - All producers within a particular product category have the same requirements, whether they choose to meet them individually or jointly with other producers.
- **Results-based**
 - Producers have flexibility to design the product management system to meet the performance goals established by government, with minimum government involvement.
 - Producer-managed systems must follow the resource conservation hierarchy of reduce, reuse, recycle, and beneficially use, as appropriate.
 - Products must be managed in a manner that is protective of human health and the environment.
 - Producers design and implement public education programs to ensure achievement of performance goals and standards established by government.
 - All consumers have convenient access to collection opportunities without charge.
- **Transparency and Accountability**
 - Government is responsible for ensuring that producer programs are transparent and accountable to the public.
 - Producer programs, including their development and the fate of products managed, provide opportunity for input by all stakeholders.
- **Roles for Government, Retailers and Consumers**
 - Government is responsible for ensuring a level playing field for all parties in the product value chain to maintain a competitive marketplace with open access to all, for setting and enforcing performance goals and standards, for supporting industry programs through procurement, and for helping educate the public.
 - Retailers only sell brands within a covered product category that are made by producers participating in an industry program, and are responsible for providing information to consumers on how to access the programs.
 - Consumers have a responsibility to reduce waste, reuse products, use take-back and other collection programs, and make appropriate purchasing decisions based on available information about product impacts and benefits.

Building Product Stewardship in Nebraska: Understanding Our Foundation

November 2010

Acknowledgements

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We also wish to thank the Nebraska Department of Environmental Quality and Nebraska Environmental Trust for sharing information on grants they have provided and allowing representatives of the Leadership and Management Team to review grant reports.

Table of Contents

What is the Nebraska Product Stewardship Initiative	3
Why is Product Stewardship Necessary.....	3
Product Stewardship in Nebraska	5
Who's Who	5
Current Collection Practices.....	6
Product by Product: An Overview of Product Stewardship Take-Back Efforts in Nebraska and Nationally	7
Appliances	7
Automobile Switches.....	8
Batteries	8
Cellular Phones.....	9
Compact Fluorescent Lamps (CFLs) and Fluorescent Tubes	10
Electronic Waste.....	11
Paint.....	12
Pesticide Chemical Containers	13
Pharmaceuticals	13
Telephone Directories	15
Thermostats.....	16
Toner and Ink Cartridges	16
Tires	17
Used Motor Oil	17
The Future of Product Stewardship in Nebraska	18
Appendix.....	18

What is the Nebraska Product Stewardship Initiative?

The Nebraska Product Stewardship Initiative (Nebraska Initiative) is a cooperative effort between non-profit organizations, municipalities, and the solid-waste management community to build product stewardship capacity and infrastructure in the state. Representatives from several of these stakeholder groups formed a Leadership and Management Team in early 2010 to coordinate the Nebraska Initiative. A list of the members of this Leadership and Management Team appear in Appendix A. Funding for this effort comes from the Nebraska Department of Environmental Quality (NDEQ) through a grant received by WasteCap Nebraska. The Product Stewardship Institute, Inc. (PSI), based in Boston, Massachusetts, is assisting a Leadership and Management Team in organizing and facilitating the Nebraska Initiative.

Product Stewardship is a principle that directs all those involved in the life cycle of a product to take responsibility for the impacts to human health and the natural environment that result from the production, use, and end-of-life management of the product. Extended producer responsibility (EPR), a central tenet of product stewardship, is a policy approach in which the producer's responsibility for their product extends to the post-consumer management of that product and its packaging. A prime example of product stewardship in action is a manufacturer providing free collection and recycling or safe disposal of the products they sell.

Product stewardship is already being implemented in Nebraska. For example, manufacturers and retailers prevent a significant amount of mercury and other toxic heavy metals from reaching landfills and incinerators by offering collection and recycling services for spent rechargeable batteries, mercury thermostats, fluorescent lamps, electronics, and auto switches. While these programs rely on voluntary industry programs, they provide a solid foundation for future product stewardship programs and policies. The purpose of this paper is to outline existing product stewardship programs in the state of Nebraska, and to establish baseline data from which to measure future progress.

Why is Product Stewardship Necessary?

Product stewardship programs prevent toxic materials found in consumer products from entering the waste stream by creating systems to collect and recycle or safely dispose of those products. Product stewardship programs also help preserve natural resources and reduce greenhouse gas emissions. Finally, product stewardship is necessary to relieve taxpayers and local governments from the financial burdens of waste management.

Reducing the Impact of Toxins in Products

Many consumer products contain materials that federal and state environmental agencies have determined to be toxic. For example, electronic products such as televisions and computers can contain lead, mercury, cadmium, lithium, phosphorous, and bromides. Batteries contain toxic metals, and oil-based paints contain volatile organic compounds. Fluorescent light bulbs and most thermostats contain mercury, which is a neurotoxin. In terms of the environmental hazards they represent, consumer products are often no different from hazardous wastes generated by

industry. For that reason, they are often referred to as household hazardous waste (HHW). Other products, such as unwanted pharmaceutical drugs, are collected because they pose safety or environmental concerns in the waste stream.

Conserving Resources and Reducing Greenhouse Gas Impacts

Consumer products can often be reused, and many contain materials that can be recycled. Neglecting to recover and reuse products and packaging results in wasted energy and other natural resources, which impact the environment through the extraction and production of virgin materials and the manufacture of new products. According to the U.S. Environmental Protection Agency (EPA)¹, the extraction, production, transport, and disposal of goods accounts for approximately 29 percent of all man-made greenhouse gas emissions. Greater reuse and recycling of consumer products and packaging are powerful greenhouse gas reduction strategies. For example, leftover paint can be reused by residents who frequent local swap shops, while nickel and cadmium from a spent rechargeable battery can be remanufactured into a new battery or other product. Non-toxic recyclables, such as bottles, cans, cardboard, and other packaging materials, represent about 30 percent of the municipal solid waste stream, nearly all of which can be recycled. Other products, such as mattresses, can be difficult to handle and create challenges for waste collection and disposal operations.

Reducing the Financial Burden on Taxpayers and Local Governments

With some products, such as ink cartridges and disposable cameras, companies have a financial interest in recapturing the goods because the recovered materials have enough market value to cover the cost of collection and processing. For most products, however, local and state governments bear the cost of managing products at the end-of-life (e.g., when they are no longer usable). These products must be collected and transported for reuse, recycling, or safe disposal, which means that tax dollars have been spent to protect the environment and public health from the unintended impacts of consumer products.

In many parts of the country, the costs to local governments of managing discarded consumer products through HHW collection programs has proven to be staggeringly high, ranging from about \$1.50 per pound of leftover pesticides to \$8.00 per gallon for leftover paint. These programs also rarely offer convenient opportunities for the public to discard products and packaging. As a result, most people end up throwing away products in their household trash or storing them in their basements or attics.

By shifting the costs of HHW management and product recycling from taxpayer-funded government programs to manufacturers and consumers, product stewardship creates the funding base needed to expand and sustain end-of-life management programs without depleting scarce government resources. By making manufacturers responsible for the unintended impacts of their products and packaging, product stewardship also creates incentives for manufacturers to redesign their products and packaging to be less costly to manage at end-of-life. When a manufacturer takes responsibility for managing their product or packaging waste at the end of its useful life, it is referred to as **extended producer responsibility (EPR)** because the manufacturer is *extending* their responsibility for their products' impacts past the point of

¹ http://www.epa.gov/oswer/docs/ghg_land_and_materials_management.pdf

manufacturing or sale, and all the way through to the end of the product's useful life. EPR programs are happening around the country, sometimes as a voluntary initiative, and other times as a result of state or local legislation. In some cases, states are passing laws even if manufacturers already provide a voluntary program – as with mercury thermostats – because they want the manufacturers to collect more thermostats and want other stakeholders, such as heating and cooling contractors, to share the burden of responsibility.

Product Stewardship in Nebraska

State Laws

Many states have passed legislation to apply product stewardship principles. However, this type of legislation typically focuses on specific products rather than enforcing stewardship principles broadly. Nebraska does not have any laws requiring manufacturers to set up and pay for the collection of their products, although there are laws on the books that provide interim measures to help offset the state's financial burden of managing certain products. In 1992, the Nebraska Legislature, as part of the **Integrated Solid Waste Management Act**, included an advanced disposal fee of \$1.00 per tire sold that goes into the Scrap Tire Reduction and Recycling Incentive Fund, which is administered by the NDEQ for the proper recycling and disposal of scrap tires. The legislation has since been modified such that the first \$1 million dollars raised each year goes to the Scrap Tire Recycling Fund, and any remaining amount goes into the Waste Reduction and Recycling Incentive Fund grant program (also administered by the NDEQ) for promoting waste reduction and recycling in the state.

Disposal Bans

Disposal bans are one tool for providing incentives to the public and businesses to ensure that their products are recycled or disposed of properly. The Integrated Solid Waste Management Act bans the following materials from landfills in the state: tires, lead acid batteries, waste oil, household appliances (white goods), yard waste (grass and leaves), and unregulated hazardous waste (except from households). Waste coming to landfills is screened to be sure it does not contain banned materials. The legislation was later altered to allow yard waste in landfills with gas recovery systems that generate power.

Several attempts have been made to enact legislation that would either regulate the disposal of electronics or set up a fund to offset the cost of proper disposal. So far, none of the bills have passed.

Who's Who?

There are several key players in Nebraska who are taking the lead in providing the state's residents and businesses with the information and infrastructure needed to collect and manage various products. The **NDEQ and Nebraska Environmental Trust (NET) provide funding support to local and regional governments, as well as, non-governmental organizations for proper collection and disposal of selected materials.** These grants fund projects such as HHW collections or collection events for electronics. A list of grants for selected material collections provided by these organizations from 2007 to 2010 appears in appendices that are attached. With

funding from NDEQ, NET, and other sources, the following groups are running collection programs to serve Nebraska:

- **Local governments:** Five local jurisdictions have permanent HHW collection facilities in Nebraska, and one more facility is nearing completion. These facilities are located in the cities of Holdrege, Kearney, North Platte, Omaha and Red Willow County. Permanent facilities like these are open year around, while other municipalities hold periodic collection events. The frequency of periodic collection events varies from six to eight per year in Lincoln, to one per year in other communities.
- **Keep Nebraska Beautiful (KNB) & Keep America Beautiful (KAB) Affiliates:** The KNB organization seeks to develop a household hazardous waste collection system so every resident in the state has access to a waste disposal program. In contrast, many KAB affiliates organize HHW collection events, electronic collection events, and pharmaceutical collection events in different parts of the state. One HHW facility in Holdrege, serves four counties with a mobile collection trailer. At least five KAB affiliates held HHW collections within the past year.
- **Resource Conservation and Development Councils (RC&Ds)²:** These regional organizations serve rural areas of Nebraska, offering support by sponsoring HHW and e-waste collection events in addition to facilitating compact fluorescent bulb (CFL) collection programs in local hardware stores.
- **WasteCap Nebraska:** WasteCap Nebraska has been involved in computer collections events since 2000. Through mid 2010, they have organized or assisted with more than 20 collection events in Nebraska. WasteCap has funds from the NET to manage e-Scrap collection events and to develop a Take-it-Back Network of retailers willing to accept CFLs, linear lamps, and rechargeable batteries for recycling. WasteCap also participates in cell phone, toner cartridge and mercury thermostat (see Bucket Project below) take-back programs.
- **University of Nebraska – Lincoln, Extension:** This group runs an agricultural pesticide-container recycling program (explained further in the section on Pesticide Chemical Containers, below).
- **Manufacturers and retailers:** Depending on the product, some companies—such as Best Buy, Dell, FedEx, Hewlett-Packard, IBM, Kinko's, and Staples—provide programs or funds for the collection and recycling or safe disposal of the products they sell (or, in the case of mercury thermostats, products that were sold in the past).

Current Collection Practices

The Leadership and Management Team of the Nebraska Product Stewardship Initiative reviewed grant reports and conducted research on various approaches to collecting specific materials. They identified current product stewardship programs in Nebraska, and calculated current collection rates from these programs. Materials ranging from appliances to used oil were analyzed. This information was used to establish a baseline of current product stewardship activities in the state.

As previously noted, a number of communities in Nebraska provide HHW collection services to residents. In 2009 and 2010 there were approximately 40 community-sponsored HHW collection events which collected more than 1.1 million pounds of HHW at a cost of more than \$1.5 million. A summary of the material collected is below:

	Pounds
Paint	466,094
Oil	163,706
Electronics	62,050
Other	452,050
Total	1,143,900

Product-by-Product: An Overview of Product Stewardship Take-back Efforts in Nebraska and Nationally

This section describes the work that is being done in Nebraska to collect and safely manage a wide range of products. We also offer a snapshot of what product stewardship looks like nationally.

Appliances

Status in Nebraska

Discarded household appliances were banned from Nebraska landfills as a result of the Integrated Solid Waste Management Act, which went into effect in 1995. However the continued hoarding of unwanted appliances due to lack of disposal outlets, and the illegal disposal of appliances in Nebraska ditches continues to be a problem.

There are scrap metal yards throughout the state that collect scrap metal and pay the generators of the scrap metal a nominal amount for the metal. Some of these firms will take appliances. Freon-containing appliances are taken for a fee that covers the safe disposal of the refrigerant.

The City of Lincoln Solid Waste Operations has an appliance de-manufacturing facility in which mercury switches, PCB ballasts, and Freon is removed and properly disposed of prior to recycling through a private scrap metal yard.

The Nebraska Public Power District used an NDEQ grant to collect and recycle 1,817 refrigerators in their service area amounting to 263,945 pounds of appliances in 2009. Funds were used for advertising, collection and recycling fees. See Appendix B for a summary of grant-funded appliance recycling from 2007-2010 in Nebraska.

Some appliance retailers will take the old appliance from the consumer and recycle them. This is generally considered part of the service provided in the purchase of the new appliance or is provided at a nominal fee. The old appliances are generally recycled through local or regional scrap metal yards.

Status Nationwide

There are no product stewardship laws in the U.S. for household appliances, though this product category is on the list to be subject to EPR requirements in Canada in the near future. In the U.S., federal law regulates³ some of the component materials of household appliances. Private companies operate recovery and recycling programs of appliances nationwide, such as the Appliance Recycling Centers of America (ARCA)⁴ which operates turnkey appliance collection and recycling programs for retailers, utilities and municipalities. The U.S. Environmental Protection Agency (US EPA) operates the Responsible Appliance Disposal Program (RAD) which is a voluntary partnership program working to reduce unlawful and hazardous disposal of household appliances. The US EPA has partnered with several utility and retail businesses and to promote safe disposal of appliances. State government agencies can also partner with RAD to increase environmental benefits in the state. For more information on the US EPA RAD program refer to <http://www.epa.gov/ozone/partnerships/rad/index.html>.

Automobile Switches

Status in Nebraska

NDEQ has worked in coordination with the national End of Life Vehicles Solutions Corporation (ELVS) program to promote mercury switch recovery from scrap vehicles.⁵ ELVS provides collection buckets to vehicle recyclers in Nebraska, and pays for the cost of transportation, recycling, or disposal of mercury from the recovered switches.⁶ For additional information refer to www.elvsolutions.org.

Status Nationwide

The National Vehicle Mercury Switch Recovery Program (NVMSRP) is a multi-stakeholder collaboration developed in 2006 to recover mercury switches from scrap vehicles.⁷ NVMSRP is carried out nationally by the ELVS program. Eight states have passed laws which require the ELVS program to offer a cash incentive to encourage vehicle recyclers to remove and recycle the mercury switches.

Batteries

Status in Nebraska

Button cell batteries, used in watches, hearing aides and miniature electronics are generally accepted and recycled from the public at no cost at household hazardous waste collection

³ 69 FR 11978

⁴ <http://www.arcainc.com/home.html>

⁵ <http://www.elvsolutions.org/nebraska.htm>

⁶

<http://www.deq.state.ne.us/AirWaves.nsf/66f49af6ce2a8f80862573230053ebbc/af1e79489508954f86257323005b6adc?OpenDocument>

⁷ [http://www.elvsolutions.org/Mercury%20Switch%20Recovery-%20annual%20report%20\(final\).pdf](http://www.elvsolutions.org/Mercury%20Switch%20Recovery-%20annual%20report%20(final).pdf)

events/facilities and retailers, including jewelry stores. This type of battery has enough high value metal to balance the cost of recycling.

Most local governments rely on the private sector to properly recycle **lead-acid batteries**. Retailers of lead-acid batteries accept used batteries at no cost when a new battery is purchased, if a core or exchange battery is present. These batteries are then recycled by the retailer through regional or national lead-acid battery recyclers. Lead-acid batteries are also accepted at household hazardous waste events and facilities, sometimes providing a small amount of revenue from the recycled lead.

Primary cell batteries such as the single use alkaline, or “heavy duty” AAA, AA, C, D, and 9-volt cells are generally not accepted for proper disposal or recycling at any commercial or government program in Nebraska. The manufacturing industry repeatedly reports that batteries of this type are not hazardous, however from a resource management and from a public education standpoint, a message of “recycle all batteries” would be beneficial.

Some businesses that sell **secondary or rechargeable batteries**, including small gel-cell batteries, also collect used batteries from their customers at no cost through the nationally available Call2Recycle program, explained further below. In 2009 there were 451 active Call2Recycle collection sites in Nebraska. Nebraska’s HHW facilities also act as Call2Recycle collection points.

All Nebraska municipalities and county governments could sign up to be public collection points in the Call2Recycle program and ease the recycling of internally generated rechargeable batteries. WasteCap offers private businesses collection boxes for their employees. They also offer the boxes to local retailers to encourage the public to recycle in stores.

Status Nationwide

Voluntary recycling programs for rechargeable batteries are available nationally through Call2Recycle, an industry-run product stewardship program. Ten states have laws that require manufacturers to provide this service for at least some types of rechargeable batteries. New York City and California both require retailers to serve as collection locations. They use the Call2Recycle program to meet this requirement. For more information on the Call2Recycle program, including how to request a collection box, please see: <http://www.call2recycle.org/>. In 2010, California considered legislation that would require the manufacturers of primary batteries to develop a product stewardship program. Although this legislation did not pass, the trend in several Canadian provinces is to require manufacturers to collect both types of batteries. For more information on product stewardship programs for batteries, please see PSI’s battery webpage: <http://www.productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=609>

Cellular Phones

Status in Nebraska

State and local organizations recycle cellular phones used internally, but do not accept them from the public.

Non-profit organizations have established collection drives for old cellular phones as fundraisers. They generally ship the cellular phones collected to a cell phone reuse and/or remanufacturing facility. Because consumers often want a new phone before their existing device has reached the end of its useful life, many phones still have value and demand in a reuse market. WasteCap works with private businesses to place collection boxes so employees can recycle old phones and peripheral items. Several KAB Affiliates collect cell phones and peripherals on an ongoing basis.

Most cellular retailers in the state offer recycling programs for old cellular phones at no cost. However, it is rare that they provide any encouragement to recycle when selling a new phone. Target, Staples, and Best Buy stores nationwide have collection points in their vestibules for cell phones, small electronic devices (such as MP3 players), and rechargeable batteries.

Status Nationwide

There is no federal legislation requiring cell phone collection, however three states have passed legislation mandating retailer take-back of cell phones.⁸ There are a number of voluntary cell phone take-back programs operated by companies such as Best Buy, Staples, and FedEx Kinko's. Retailers typically use the Call2Recycle program because they can collect batteries and cell phones in the same box with one recycler.

Compact Fluorescent Lamps (CFLs) and Fluorescent Tubes

Status in Nebraska

The Nebraska Environmental Trust has provided 3 year grant funding to WasteCap Nebraska to develop a "take-it-back" network of hardware stores that collect compact fluorescent bulbs and fluorescent tubes from the public. Known as "[Another Bright Idea](#)," this program seeks to meet the need for a consumer-friendly recycling option for compact fluorescent light bulbs and linear tubes in Nebraska. During the initial five-month collection period in 2009 and 2010, a total of 735 pounds of fluorescent lighting (1,107 units) were collected at 23 locations. In addition to the collection and recycling, grant funds are used for start-up costs such as, collection supplies, personnel, and public education. WasteCap has partnered with the Omaha Public Library system and Lincoln hardware stores to coordinate a network of drop-off locations especially tailored to individual households. In Lincoln and other hardware-store-based collection points, grant funds cover the cost to transport and recycle the CFLs collected in the program; in the future, this cost will either be passed on to the consumer or financed through a manufacturer-financed product stewardship program. Linear tubes are also collected, but at a charge to the consumer. In Omaha, all costs to recycle the bulbs are paid by Under The Sink, the City's household hazardous waste facility. As of August 5, 2010, there were 33 collection sites in Nebraska. For more information about state grants for programs involving CFL and linear tube recycling, please see Appendix C.

The goal for CFL collection is to create a statewide network of 100 or more conveniently-located drop-off sites along with strategically-located consolidation points for the lamps before they are sent to recycling facilities. The program is being aggressively advertised, with ads running on Time Warner Cable in Lincoln and Cox Cable in Omaha. Future plans to raise awareness of the program include statewide radio, statewide billboards, Facebook, and statewide broadcast television.

⁸ INFORM. 2008. "Cell Phone Take-Back Programs in New York City" Available online. URL: http://www.informinc.org/pdfs/Cell_Phone_Report_FINAL_Sept_29.pdf

For businesses, fluorescent bulbs are classified as a “universal waste” where regulations allow greater latitude in handling, storage and disposal of potentially hazardous material in order to promote preferable recycling opportunities. Larger businesses tend to use recycling service providers to take their burned out lamps; however small and medium-sized businesses that do not generate as much waste also need options for recycling fluorescent lamps. Sites that will accept business-generated lamps are also being identified as part of the WasteCap project. Several KAB Affiliates have on-going collection of CFLs through a mail-back bucket program, as well.

Nationwide

Consumer fluorescent lamps, including both CFLs and linear tubes, are being collected and recycled at numerous types of collection points around the country. Most of these programs are local or regional, and have been developed through partnerships among local government, retailers, and utilities or energy efficiency programs (among others). Maine requires manufacturers pay for recycling programs for households, while Washington requires manufacturers also fund programs for small businesses or organizations. The Home Depot and Lowe’s also provide collection and recycling of CFLs only (not linear tubes) at their locations across the country. For more information about product stewardship programs for CFLs and linear fluorescent bulbs, please go to PSI’s webpage:

<http://productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=271>

Electronic Waste

Status in Nebraska

Electronic devices contain valuable materials such as gold, silver, and copper that can be remanufactured at the end of the product’s useful life. The value of these materials has allowed for-profit businesses to provide a disposal opportunity for electronic devices. Electronics recyclers generally charge by the pound, or by the type of item. Unfortunately, questions about environmental harm caused by the inappropriate disposal of recyclables have plagued the industry. These businesses rarely exist outside Lincoln or Omaha, and open and close in rapid succession.

NDEQ and the Nebraska Environmental Trust have provided funds for e-waste collection events. These events are sponsored by regional governmental organizations or local NGO’s. Appendix A summarizes grants provided by these agencies during the last three years. At least eight KAB Affiliates have one or more electronic collections each year.

WasteCap’s E-scrap Nebraska project seeks to develop electronics recycling infrastructure, increase electronics recycling awareness, increase access to environmentally safe recycling options, and provide a funding mechanism for local communities to host electronics collection events. WasteCap achieves this by (1) developing a statewide education and marketing program to create a consistent message regarding electronics recycling in Nebraska, (2) developing a set of minimum performance standards for electronics recyclers, and (3) administering a small grant program for computer collection events in local communities. The project will fund as many as 18 electronics collection events from July 2009 through June 2011.

Based on grant data from the NDEQ and Nebraska Environmental Trust, a total of 30 communities held electronic collection events in 2009. A total of 425,028 pounds of electronics were recycled during these collection events. See Appendix D for more information on state grants for electronics recycling programs.

Status Nationwide

US EPA has developed a coordinating program, eCycling, between local and state governments, producers, manufacturers, and retailers to promote electronics recycling. Many national manufacturers of computer equipment such as Hewlett-Packard, Dell, and IBM allow for consumers to mail-in old equipment for recycling. The manufacturers generally cover the cost of shipping for the computer equipment. Best Buy and Staples provide recycling services for computer equipment for a small fee (sometimes offset by a coupon).

The lack of national legislation has resulted in a patchwork of laws throughout the country, making it difficult for manufacturers to design programs around the specific nuances of legislation in each state. There are currently 23 states with EPR laws for electronic waste, though they vary in exactly what they require of the manufacturers. Some laws require only that manufacturers provide take-back programs for consumers with no fee, while others set more specific requirements for the manufacturers to meet. For more information about product stewardship programs for electronics, please go to the PSI webpage:

<http://productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=64>

Paint

Paint falls in two categories, non-hazardous latex paint that is a nuisance to dispose, and alkyd (oil based) that is treated as hazardous material for disposal due to its volatile organic compounds (VOC) and its flammable potential.

Status in Nebraska

NDEQ has provided grant funds to research disposal alternatives for paint.

Some KAB affiliates, EcoStores Nebraska and other local government programs facilitate Paint Drop and Swap events on an annual basis.

In Omaha, Under The Sink collects both types of paint. Under The Sink pays for the proper disposal of alkyd paint, shipping it to Oklahoma for incineration. Latex paint is bulked and repurposed as a component in an alternative daily cover at the Sarpy County landfill. A total of 212,186 pounds of paint was collected in 2009 by the Under The Sink program. See Appendix E for a list of grant-funded HHW collection facilities and collection events.

Status Nationwide

Since December 2003, PSI has facilitated a national dialogue with US EPA, state and local governments, manufacturers, retailers, paint recyclers, and contractors to develop leftover paint management solutions that are both financially and environmentally sustainable. These discussions resulted in the first Paint Product Stewardship legislation passed in Oregon in the summer of 2009. Notably, the American Coatings Association supported the legislation. The

program went into effect in July 2010, and is currently being evaluated. California passed the second law in 2010. The hope is that eventually there will be paint stewardship programs across the country based on the lessons learned in Oregon. For more information about paint product stewardship programs, please go to the PSI webpage on paint:

<http://www.productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=116>

Pesticides Chemical Containers

Status in Nebraska

The University of Nebraska-Lincoln Extension in Lancaster County coordinates a statewide pesticide container collection program. The UNL program is funded by the Agricultural Container Research Council, a national coalition of agrichemical manufacturers. They have contracted with Container Services Network to collect the plastic chemical containers. There are 40 collection locations statewide. Local distributors aid UNL Extension by informing customers about recycling opportunities for the pesticide containers. There is no fee to users for recycling the containers.

The UNL Extension program has operated for 18 years and has collected a total of 950 tons of plastic pesticide containers. Plastic from collected containers is used to make industrial and consumer products such as shipping pallets, drain tile, dimension lumber and parking lot tire bumpers. Recycling sites, guidelines and program details are on UNL's Pesticide Education Resources website at: <http://pested.unl.edu/pesticide/pages/index.jsp>.

Status Nationwide

In California, effective January 1, 2009, all first-sellers of agricultural pesticide products must participate in a certified HDPE recycling program and submit annual certification documents to ensure compliance. A number of other states have pesticide container recycling programs similar to that of the UNL Extension program. For more information on product stewardship programs relating to pesticide use, storage, and disposal, please go to the PSI pesticides webpage:

<http://www.productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=176>

Pharmaceuticals

Status in Nebraska

NDEQ provided grants to develop a statewide education program about the proper disposal of pharmaceuticals. This was in cooperation with the Nebraska MEDS (Medication Education and Disposal Strategies) group that is composed of several statewide stakeholders. This includes representatives from the following organizations and government entities: Nebraska Pharmacists Association, NDEQ, Nebraska Regional Poison Center, Nebraska Board of Pharmacy, and the Groundwater Foundation and the Lincoln-Lancaster County Health Department. Information about the program is available at: www.nebraskameds.org.

The Nebraska MEDS group recently made the decision to apply for grant funds via NDEQ/NPS Section 319 and Nebraska Environmental Trust funds for the development and implementation of a pilot pharmaceutical take-back project in Lincoln and Lancaster County. Two factors are currently driving the project. They include a July 12, 2010 decision by the Nebraska Board of Pharmacy that unanimously determined that current Nebraska statute allows for the return of

non-controlled medications to the dispensing pharmacy and an ongoing pharmaceutical return project in Iowa called the Iowa *TakeAway Environmental Return System*. To date, the Iowa project has signed on more than 400 pharmacies (one in every county) in Iowa. They properly disposed of more than 6,000 pounds of unwanted medications so far.

If funds become available, the Nebraska MEDS group will work to duplicate the success of the Iowa project in addition to modifying the project where the Iowa approach falls short. This will include working with area pharmacies, both corporate and independent, in providing a year-round safe and legal medication disposal system. The Lincoln and Lancaster County pilot will serve as a model for a possible statewide pharmaceutical waste disposal system.

The NDEQ has also provided grants for local organizations to offset the cost of pharmaceutical collection events. At least four KAB affiliates have held pharmaceutical collection events during the past year; KAB will produce a brochure and other public awareness materials in the near future. In communities where local law enforcement officers are willing to participate, special pharmaceutical events have been held to collect controlled substances.⁹ This includes the September 25, 2010 one-day National Medication Take Back Day sponsored by the Drug Enforcement Administration. Four Walgreens participated in this event in Lincoln with higher participation rates than anticipated. Some communities that sponsored household hazardous waste collections also collected pharmaceuticals. For information on all of the grant funding provided in the state for programs involving pharmaceutical take-back, please see Appendix F.

In 2009, five communities sponsored pharmaceutical collections. One collection reported number of pills or medications collected, while others reported the pounds of pharmaceuticals collected or did not report anything. According to Keep Scottsbluff-Gering Beautiful, their program collected a total of 1,350 pounds from approximately 200 participants in the spring of 2010. The inconsistency in reporting has made it difficult to accurately track statewide collection data.

Status Nationwide

Pharmaceutical collection programs are happening across the country, and examples can be found on PSI's drug take-back website at: http://takebacknetwork.com/local_efforts.html. Similar to the fluorescent lamp collections, these are typically local or regional programs and based on the development of local partnerships and funding sources. Pharmacies are increasingly playing a role as collection sites, or, in some cases, they distribute envelopes for patients to mail their leftover drugs back to a reverse distributor or other facility where they will be destroyed. Seven states have considered EPR legislation for pharmaceuticals, though none have passed. Examples of EPR for pharmaceuticals can be found in Canada and Europe.

Recently, Congress passed legislation to change the Controlled Substances Act, thereby allowing for more options for collection of these drugs than just law enforcement. PSI has [recommended factors that should be considered](#) in developing new laws and rules, and worked

⁹ Currently, the federal Controlled Substances Act prohibits the collection of this subset of drugs (characterized by their high rates of abuse and addiction) by anyone but law enforcement. See 15 U.S.C. §2601 et seq. (1976).21 USC Ch. 13. Controlled Substances Act.
<http://www.justice.gov/dea/pubs/csa.html><http://www.epa.gov/lawsregs/laws/tsca.html>

closely with Congressional offices, the Administration, and a unique coalition of state and local agencies, organizations, and companies to effect this change. PSI will continue to provide information from its members and partners to inform the rule-making process. For more information about national product stewardship programs for pharmaceuticals, please go to the PSI pharmaceuticals webpage at

<http://www.productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=181> or PSI's webpage for the drug take-back network at <http://www.takebacknetwork.com/>.

Telephone Directories

Status in Nebraska

Some municipal recycling programs accept telephone directories as part of residential mixed paper. In addition, some directory publishers set up recycling programs when they distribute their directories locally. They may also make a monetary contribution to local recycling programs that accept telephone directories as part of their services.

In southeast Nebraska, Yellow Pages Direct worked with the regional phone company, Windstream, and with Recycling Enterprises to set up a telephone directory recycling program. Six collection containers were located at the city's Community Recreation Centers for six weeks. A total of 5,500 pounds of unwanted telephone directories were collected. Recycling Enterprises estimates they processed roughly 70,000 pounds of phone directories that came from businesses, Windstream, and the local drop-off sites. Yellow Pages Direct provided \$1,000 to the host collection sites.

Status Nationwide

Several state and local governments are currently developing opt-out legislation to manage the cost of collection and recycling from unwanted telephone directories. Opt-out legislation allows consumers who do not desire a phone book the opportunity to opt-out of receiving a directory. The legislation can also be used to limit materials that will pose an unreasonable burden to recycle, prohibit inks that may contain chemicals, assess fees for recycling and collection, and create mandatory recycled content standards. Other strategies include increasing recycling options, such as expanding curbside collection programs and holding periodic collection events. In 2006, the National Waste Prevention Coalition approached PSI to help them reduce phone book waste. After two PSI-facilitated meetings, directory publishers agreed to implement an opt-out provision allowing consumers to say "no" to telephone book delivery, increase phone book recycling, and enhance the sustainable production of the books. While the industry has put in place the first-ever opt-out system, it has resisted PSI's efforts to ensure that the system is effective. PSI has therefore embarked on a four-part strategy: (1) partner with Catalog Choice--a non-profit organization that allows consumers to opt-out of receiving direct mail--to promote the industry phone book opt-out system and track system performance; (2) develop model legislation that includes opt-out and opt-in provisions for white pages and yellow pages, as well as producer-financed recycling; (3) continue to communicate directly with phone book publishers and seek joint strategies; and (4) enhance PSI's clearinghouse of phone book information. For more information on the phone book product stewardship program, please go to PSI's webpage at

<http://www.productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=186>

Thermostats

Status in Nebraska

The Health and Human Services Department promotes the program established by the national Thermostat Recycling Corporation (TRC): a non-profit, producer responsibility organization that facilitates collection and disposal of mercury containing thermostats. Many Nebraska heating and air conditioner contractors participate in the program. Consumers are not assessed a fee for recycling a thermostat. Please see Appendix G for a list of locations in Nebraska that provide recycling services of mercury thermostats. More information on these collection sites is available at <http://www.dhhs.ne.gov/mercury/DropOffSites.pdf>. Thermostats can also be put in the Bucket Program receptacles being distributed throughout the state by KNB and the DHHS through the School Chemical Cleanout Campaign Program.

Status Nationwide

TRC has worked with several state and local governments to promote thermostat collection and recycling programs, and develop legislation on thermostat collection and recycling. Eight states have passed laws requiring TRC to operate in their state, and set various requirements for contractors and wholesalers, as well as target collection goals for TRC to meet. These laws are based on a model developed by PSI through a multi-stakeholder negotiation in 2006. In 2008, TRC recorded 135,604 thermostats collected nationally; 998 of which were collected in Nebraska.¹⁰ For more information on product stewardship programs for thermostats, please go to PSI's webpage at

<http://www.productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=337>

Toner and Ink Cartridges

Status in Nebraska

Companies and organizations are taking the lead on recycling toner and ink cartridges, which have the benefit of being refillable. There are a number of non-profit organizations that collect print cartridges and send them to local or regional recyclers as a fundraising effort. Local retailers, such as Walgreens, are collecting and recycling print cartridges and offer refilling of print cartridges for a fee. Several KAB Affiliates, WasteCap, schools and other non-profits have on-going toner/ink cartridge collections. Some retailers, such as Office Depot, also offer a discount on paper purchases when the customer recycles ink-jet cartridges.

Status Nationwide

Because of the ability to refill and re-sell used cartridges, industry is taking the lead in collecting and recycling these products. Staples, Best Buy, Hewlett-Packard, and Dell all receive used ink cartridges through in-store drop off or mail-in options which are offered nationwide. Private companies find economic benefit in recycling or refilling used ink cartridges and, as such, the industry take-back programs have diverted used cartridges from general waste streams.

¹⁰ http://www.thermostat-recycle.org/files/u3/2008_TRC_Annual_Report.pdf

Tires

Status in Nebraska

Nebraska law prohibits the disposal of tires in landfills as part of the Solid Waste Management Act. This ban went into effect in 1998. An advanced disposal fee of \$1 per car passenger tire is assessed by tire retailers. This money goes to the NDEQ to fund tire clean-ups, and to partially reimburse manufacturers for recycled tires used in new products. Waste tires are used to make rubberized asphalt roadways, running tracks, playground mats and crumb rubber for football fields.

Some local governments and NGOs have sponsored tire “amnesty-day” clean up events in which the public can drop off and recycle their scrap tires at no cost.

Tire distributors and retailers recycle used tires generated from their business. They generally charge a fee of \$2.00 to the consumer to cover the cost of transportation and disposal of the tires.

Between 2007 and 2009 a total of 138 tire-collection events were held, with a total of 1,921,042 tires collected. NDEQ funded these collections at a cost of \$1,992,093. In 2009, tire collection events hit a three-year high: some 59 collection events recovered 767,131 tires at a cost of \$769,809. For more information about grant programs for tire recycling, please see Appendix H.

Nationwide

Scrap tires, as solid waste, are handled primarily by state governments. Currently, 48 states have laws regulating the management of scrap tires. Some automotive dealers may take back old tires in partial trade for new ones, as they can make money by recapping and retreading the tires for reuse (although this is generally limited to larger truck tires). Otherwise, many private tire recycling companies nationwide accept old tires for processing into fuel or for civil engineering applications such as rubberized asphalt. For more information about national product stewardship programs for tires, please go to PSI’s webpage at

<http://www.productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=197>

Used Oil

Status in Nebraska

NDEQ has provided grant funds to Keep Nebraska Beautiful to develop the Nebraska Used Oil Collection program. KNB has recruited 67 government agencies throughout the state to host a used oil collection tank. KNB then solicits bids from oil recyclers to collect the oil and antifreeze from the host locations. Oil tank hosts are paid a nominal amount per gallon from the recycler. The host locations typically collect between 30,000 and 60,000 gallons of oil from roughly 2,500 participants per quarter. In 2009, 178,251 gallons of oil were collected. For more information about the grant funding provided for programs involving used oil collection, please see Appendix I.

Some auto repair shops, farm cooperatives and auto parts stores accept used motor oil at no cost to the consumer for recycling. The amount of oil recycled through their efforts is not tracked.

Nationwide

Federal regulations exist in the United States to ensure the proper management of used motor oil by industrial and commercial sources, such as automotive repair garages. For consumers that change their own motor oil at home, used motor oil is accepted for recycling at some service stations and most municipal household hazardous waste collection sites. Used motor oil may be burned for fuel, used as a fuel source in asphalt production, or re-refined for use as a lubricating oil base.

The Future of Product Stewardship in Nebraska

There are several voluntary national product stewardship programs that are not being fully utilized in Nebraska¹¹. There are a number of local non-profit organizations, as well as local governments and regional organizations that are providing quality services to Nebraska residents for the proper disposal and recycling of their household hazardous waste and problem waste. Unfortunately, these programs rely heavily on grants from the NDEQ and the NET and these grants are not a reliable funding source for on-going programs. In addition, it is difficult for local governments to start new programs or services during times of reduced budgets and a poor national economy.

Current collection programs in the state for various materials do not fully reflect the product stewardship model because they do not share proportional responsibility with industry. These programs, however, do provide the necessary infrastructure for future industry-operated product stewardship programs, by developing sustainable end-of-life solutions for consumer products. The Nebraska Product Stewardship Initiative aims to strengthen these existing product collection programs, and, in doing so, build capacity for product stewardship program complete systems for extended producer responsibility.

Appendices

Appendix A	List of Nebraska Product Stewardship Leadership and Management Team
Appendix B	Grant programs for appliance recycling
Appendix C	Grant programs for CFL & linear fluorescent bulb recycling
Appendix D	Grant programs for electronics recycling
Appendix E	Grant programs for HHW recycling
Appendix F	Grant programs for pharmaceutical take-back
Appendix G	Thermostat drop-off locations in Nebraska
Appendix H	Grant programs for tire recycling
Appendix I	Grant programs for used oil collection and recycling
Appendix J	Table summarizing collection programs available by product and sector

¹¹Appendix J summarizes product collection programs currently available

**American Bar Association
Section of Environment, Energy and Resources**

“From Birth to Rebirth: Will Product Stewardship Save Resources?”

**Chaz Miller
National Solid Wastes Management Association
Washington, DC**

**19th Section Fall Meeting
Indianapolis, IN
October 12 - 15, 2011**

ABSTRACT

Product stewardship laws have been enacted in 32 states. These laws cover nine categories of products, most of which contain hazardous components such as mercury. Electronics products, automobile switches and thermostats are the most commonly covered products. Recently states have begun to extend product stewardship to cover paint and carpets and are considering extension to clearly non-hazardous products such as packaging and printed materials. The most commonly cited objectives for product stewardship laws are to internalize a product's waste management costs, create incentives for improved product design and reduce the cost of solid waste management currently borne by local governments. This paper examines the status of current product stewardship laws and whether or not they have met product stewardship objectives. The paper questions the wisdom of extending these laws to more traditionally recycled materials such as packaging and printed materials without additional experience from current programs throughout the world. Finally, the paper examines the impact of product stewardship laws on traditional oversight of solid waste management by state and local governments.

(Note: The views expressed in this paper do not necessarily reflect those of the National Solid Wastes Management Association or the Environmental Industry Associations.)

Introduction

Product stewardship laws represent what some believe to be the next wave in managing solid waste. The goal of these laws is to ensure “that all those involved in the lifecycle of a product share responsibility for reducing its health and environmental impacts, with producers bearing primary financial responsibility.”¹ The first product stewardship laws, which covered batteries, were enacted in Minnesota, New Jersey and Vermont in 1991.² A few other battery-

¹ *What is Product Stewardship?*, PRODUCT STEWARDSHIP INSTITUTE (PSI), <http://productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=55> (last visited Sept. 9, 2011).

² *Extended Producer Responsibility State Laws as of August 2011*, PSI, <http://www.productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=2801> (last visited Sept. 9, 2011).

related laws were passed in the 1990s. However, interest appeared to die out until the passage of an electronics recycling law in Maine and a mercury automobile switch law in New Jersey in 2004. By 2011, 25 laws covering electronics products had been enacted, with the biggest surge in 2008. Fourteen states enacted automobile switch laws, all but one by 2006. Ten states passed thermostat laws, six of them in 2008. Nine laws cover different types of batteries. An additional nine laws cover an array of products including paint, fluorescent lights, cell phones, pesticide containers, “green chemistry,” and carpets. These are among the most recent laws. California enacted its cell phone law in 2004 and its green chemistry and pesticide container laws in 2008. The other six laws were enacted more recently.

Finally, one state, Maine, enacted a “framework” law in 2010. Framework laws establish a mechanism in which state regulators instead of state legislators select products that will be subject to product stewardship. The goal is to “streamline” (and perhaps depoliticize) the process of creating product stewardship requirements.³

Advocates generally cite three core objectives for product stewardship. First, the internalization of post-consumer management costs in a product’s cost. Second, when manufacturers have to bear this cost, it will create an incentive to design improvements to increase recyclability and reduce the use of toxic components. Third, as a result, local governments will have lower solid waste management costs. This paper will examine these core objectives along with a fourth issue: the impact of product stewardship on the ability of state and local governments to manage solid wastes. The paper will also examine the potential for expanding these laws to more traditional recyclables.

1. Cost internalization and design improvements

At the heart of product stewardship theory is the belief that product prices do not include the “external” costs imposed by those products. These include all the costs associated with the manufacture of the product starting with extraction of raw materials and ending with the cost of final disposal of that product.⁴ If manufacturers had to internalize these costs they would find ways to design “greener” products with lower external costs. As the Product Policy Institute puts it, “This approach creates a link between production and waste management, which in turn creates an incentive to lower waste management expenses. These expenses decrease when products have fewer hazardous materials and/or are designed for easy reuse or recycling.”⁵ Product stewardship laws, however, only focus on end-of-life disposal, with the hope of having some impact on lowering the external costs associated with the extraction of a product’s raw material and the processing of those raw materials into end products. Those activities have a greater environmental and cost impact than that of the disposal of the end product.⁶

³ *Framework Product Stewardship Policy*, PSI, <http://www.productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=688> (last visited Sept. 9, 2011).

⁴ Noah Sachs, *Planning the Funeral at the Birth: Extended Producer Responsibility in the European Union and the United States*, 30 HARV. ENVTL. L. REV. 51, 76 (2006).

⁵ *EPR/Product Stewardship Q&A*, PRODUCT POLICY INSTITUTE, <http://www.productpolicy.org/content/eprproduct-stewardship-q> (last visited Sept. 9, 2011).

⁶ “Corrugated Packaging Alliance, *Corrugated Packaging Lifecycle Assessment Summary Report* (Feb. 2010), <http://corrugated.theresponsiblepackage.org/Upload/LCA%20Summary%20Report%20FINAL%20203-24-10.pdf>; INNOVATION CENTER FOR U.S. DAIRY, *U.S. Dairy Sustainability Commitment Progress Report* (Dec. 2010), http://www.usdairy.com/Public%20Communication%20Tools/USDairy_Sustainability_Report_12-

Product stewardship advocates stress the importance of a product's manufacturer taking responsibility for post-consumer management of the product and its packaging. If, they argue, manufacturers bear the cost, they will have the incentive to design for recycling. This duty can be handled through "individual responsibility" in which each company has direct responsibility for managing its products or through "collective responsibility" in which a product stewardship organization is established to handle this function.⁷

Under, "individual responsibility" each company sets up its own retrieval operation. These individual systems will have inherently higher costs and a higher environmental impact than the collective approach due to their inability to achieve economies of scale. This approach reached the end point of absurdity with the original electronics take back program in New York City which required manufacturers to dispatch a truck to a consumer's house to pick up a used computer.

As a result, product stewardship legislation usually allows for a "collective" approach in which a product stewardship organization composed of industry members will be responsible for taking back and managing the end of life disposal or recycling costs. This "collective" approach allows costs and the environmental impact of collection to be shared among a wide array of actors. However, as costs are pooled, individual companies whose products have a higher environmental impact and recovery costs have no incentive to lower those costs. The need to mitigate that cost and to design "greener" products is lost.⁸

2. Cost of solid waste management

The idea that local governments and taxpayers bear the burden of the cost of solid waste management systems is the most compelling argument in favor of product stewardship laws. Time and again, advocates argue for the necessity of moving this financial burden to manufacturers.⁹ When this happens, they argue, local governments will be freed of this cost.

Determining the actual impact of solid waste costs on local governments and the benefits from product stewardship, however, is difficult. Based on extensive surveys of publicly available data, the National Solid Wastes Management Association estimated the average household pays

[2010%20\(4\).pdf](#); CONSUMER ELECTRONICS ASSOCIATION, *Inspiring Change-CEA 2010 Sustainability Report*, (2010), <http://www.ce.org/PDF/CEA001-R2.pdf>.

⁷ Sachs, *supra* note 4, at 62-63.

⁸ Sachs, *supra* note 4, at 65, 71, 76 (Sachs notes, for instance that "firms have no particular incentive to improve the environmental profile of their own products if they know that they will be charged for end-of-life waste management in conjunction with their industry group as a whole and that the fee will not be scaled for environmental impacts."); David Tonjes, Comment, *Draft Generic Environmental Impact Statement (DGEIS) supporting Beyond Waste: A Sustainable Materials Management Strategy for New York*, 50 (Aug. 9, 2010).

⁹ See ASSOCIATION OF STATE AND TERRITORIAL SOLID WASTE MANAGEMENT OFFICIALS, *Product Stewardship Framework Policy Document* (Oct. 28, 2009), <http://www.deq.state.or.us/lq/pubs/docs/sw/PSFrameworkPolicyDocASTSWMO.pdf> ("local governments are required to manage and pay for whatever winds up on the curb"); NATIONAL LEAGUE OF CITIES, *Principles for Product Stewardship*, (Dec. 4, 2010), www.productstewardship.net/PDFs/libraryGeneralResolutionNLC.pdf ("local governments across the nation are adversely affect by the rising costs of ensuring the safe management, recyclability, and disposal of consumer waste"); Sachs also assumes that in the United States waste management is largely funded out of general tax revenues. Sachs, *supra* note 4, at 56.

between \$12 and \$20 per month for trash, recycling and yard waste collection.¹⁰ This is a very low cost when compared to other services such cable television or cell phones. Moreover, not all waste or recyclables are collected by local governments nor are all waste management costs paid through taxes. In almost all cases, local governments are directly responsible for collecting residentially-generated garbage and recyclables from single family housing and from smaller multi-family units such as duplexes. They meet this collection responsibility either by using local government employees or by contracting with private sector companies. In many smaller cities and rural areas, individual residences contract directly with private haulers for solid waste services. Estimates on the amount of residentially-generated waste vary. EPA estimates that 55 – 65 percent of the 243 million tons of municipal solid waste generated in 2009 is generated residentially, including multi-family dwellings.¹¹ State data shows much lower generation from residential accounts. California, for instance, estimates that commercial facilities generate 68 percent of the state's waste stream with multi-family housing generating one fourth of the remainder, leaving about 24 percent of the waste stream as single-family residential.¹²

The cost for providing this service can be paid either directly to the local government through taxes or fees or to the private hauler who bills and collects the monthly charge from individual residences. By contrast, commercial waste and recycling services, including those for multi-family housing, are normally paid directly to the private contractor by the business or building owner. The amount of the residential waste and recycling collection costs paid by taxes is hard to estimate. However, a reasonable assumption, based on industry experience and comments from industry experts, is that well under 30 percent of American cities use the tax base to pay for residential, single family, solid waste management costs. These include many larger cities, primarily east of the Rockies, but also Los Angeles on the west coast.¹³ With a trend towards increased privatization of solid waste services, the number of cities using the tax base to pay for solid waste management services will only decline.

A political issue also exists. Will taxes be lowered in jurisdictions that enact product stewardship laws? If the goal is to lower the impact of these costs on taxpayers, surely they must be. However, no evidence exists that taxes or residential collection costs have been lowered as a result of product stewardship laws. Local governments have kept whatever financial savings they achieved. Their residents get to pay twice – first as taxpayers and then as consumers of product stewardship products.

3. *Status of Existing Product Stewardship Laws*

Batteries were the first product to be subject to product stewardship laws. Six states passed laws in the 1990s. In response, the Rechargeable Battery Recycling Corporation was formed to manage battery recycling. That organization now operates Call2Recycle®, which provides “free” battery and cell phone recycling in North America.¹⁴ States have shown some

¹⁰ NATIONAL SOLID WASTES MANAGEMENT ASSOCIATION, *Residential Trash Collection: An Essential Service at a Bargain Price* (2006), <http://www.environmentalistseveryday.org/docs/research-bulletin/Research-Bulletin-Service-At-A-Bargain.pdf>.

¹¹ EPA, *Municipal Solid Waste in the United States: 2009 Facts and Figures*, 11 (Dec. 2010), <http://www.epa.gov/osw/nonhaz/municipal/pubs/msw2009rpt.pdf>.

¹² CASCADIA CONSULTING GROUP, *Executive Summary, Statewide Waste Characterization Study*, 3 (Dec. 2004), <http://www.calrecycle.ca.gov/Publications/LocalAsst/34004005.pdf>.

¹³ Interview with Dr. Barbara Stevens, Ecodata (Aug. 16, 2010). (Dr. Stevens is a nationally recognized expert on collection costs who was involved in two Columbia University studies of solid waste management collection costs.)

¹⁴ See CALL2RECYCLE (Sept. 9, 2011), <http://www.call2recycle.org/home.php?c=1&w=1&r=Y>.

interest in battery recycling recently with Florida and New York enacting rechargeable battery recycling laws in the last two legislative sessions.

Automobile switch recycling is managed by the End of Life Vehicle Solutions Corporation which was created by the automotive industry and manages collection of mercury switches from automobile dismantlers. Operation of the program is contracted out to the Environmental Quality Company.¹⁵

Thermostat recovery is managed nationally by the Thermostat Recycling Corporation (TRC). Consumers must bring thermostats to a collection point where they are consolidated and shipped by TRC to processors. TRC does not charge a fee for shipping or processing collected thermostats, however, it charges a one-time \$25 fee for collection points.¹⁶

Although 25 states have laws covering electronic product recovery, those laws vary widely in terms of which products are covered, recovery goals for those products and responsibility for recovery. These laws include California's unique law which requires retailers to include a visible advance recycling fee when selling certain electronic products.¹⁷ Those fees are used to fund electronics recycling programs. In spite of the transparency of the fee and the success of the California program in recycling electronics products, product stewardship advocates do not consider advance recycling fees to be the correct approach and do not include it in their list of states with these laws. Interestingly, the paint stewardship laws in California, Oregon and Connecticut include a visible "eco-fee" which is paid at the point of purchase. In each state that money goes to a privately managed product stewardship organization.

4. Effectiveness of Product Stewardship Laws

Data about the effectiveness of existing product stewardship laws in terms of meeting their objectives is skimpy at best. Clearly collections have increased, but at what cost to consumers or benefit to taxpayers? Design improvements have been made, but the extent to which they are the result of product stewardship laws or ongoing technological advances is unclear.

Industry establishment of takeback organizations for battery, automobile switch and thermostat laws has increased recovery of those products. Perhaps because they do not limit their operations to states with product stewardship laws, interest in additional state legislation seems to have lessened. In addition, the products they collect are small and relatively easy to collect. Paint and carpet are subject to recently enacted product stewardship laws that are still being implemented.¹⁸ As a result, it is too early to examine their effectiveness.

As for electronics products, most of those laws are also too recent in implementation to assess either their short-term or long-term effectiveness or their cost. The National Center for Electronics Recovery (NCER), a non-profit that promotes the development of a national infrastructure for the recycling of used electronics, publishes an annual per capita collection index. That index measures collection volumes of used electronic equipment in six ongoing

¹⁵ See END OF LIFE VEHICLE SOLUTIONS (Sept. 9, 2011), http://www.elvsolutions.org/mercury_home.html.

¹⁶ See THERMOSTAT RECYCLING CORPORATION (Sept. 9, 2011), <http://www.thermostat-recycle.org/>.

¹⁷ California Senate Bill 20, Chapter 526, http://www.leginfo.ca.gov/pub/03-04/bill/sen/sb_0001-0050/sb_20_bill_20030925_chaptered.pdf

¹⁸ Paint legislation was enacted in Oregon in 2009, California in 2010 and Connecticut in 2011, carpet legislation in California in 2010.

programs across the United States. According to NCER's 2010 index, collection volumes decreased by two percent from 2009 to 2010. NCER's Executive Director, Jason Linnell, noted that "some programs are entering a steady collection phase, while others are subject to year-to-year fluctuations."¹⁹ An additional long-term question for these laws concerns the amount of covered products that are no longer used but are still in the owner's attic or basement. After this seemingly large pool of products is collected, will per unit collection costs increase as the available pool of products decreases?

5. Expansion of Product Stewardship

Most of the current product stewardship laws apply to products with hazardous constituents such as mercury or lead. Automobile switches, thermostats, electronics products, batteries and fluorescent lights all contain at least one hazardous constituent. While the environmental impact of improper disposal of most of those products is clear, whether or not disposal of electronics products creates an environmental issue is a separate issue.²⁰

The current trend is to extend these laws to products such as paint and carpet. Clearly lead-based paint causes environmental harm which is why lead was banned from household paint in 1978. Oil-based paints contain solvents, water-based (latex) paint does not. The cost of special collection programs for paint, much of which is water-based, has led to the passage of paint product stewardship laws in three states, Oregon, California and Connecticut.

Carpets are bulky and can cause collection problems if placed in the trash. The carpet industry is actively working with state and local governments in operating the Carpet America Recovery Effort (CARE).²¹ California's recently passed first in the nation product stewardship law for carpets assigns initial responsibility for implementing the new law to CARE.²²

Collection and disposal of non-hazardous products such as packaging and printed materials does not cause environmental problems. Product stewardship advocates argue for extension of these laws based on the cost of solid waste management to local governments, not on any inherent environmental or public health risk in these products. Obviously, society and the

¹⁹ Press Release, NCER, Electronics Recycling Collection Index Shows Slight Decrease for 2010 (May 27, 2011), <http://www.electronicrecycling.org/public/UserDocuments/Press%20Release%20Per%20Capita%20Collection%20Index%20May%202011.pdf>.

²⁰ For instance, Barry Breen, Deputy Assistant Administrator, U.S. EPA's Office of Solid Waste and Emergency Response, testified before the U.S. House Subcommittee on the Environment and Hazardous Materials, July 20, 2005 that the pH in a mature landfill is usually close to neutral (usually around 6.8, neutral is 7.0). In other words, the landfill is a neutral environment and not acidic. As such, CRTs in a Subtitle D landfill will not be bathing in an acid solution. Mr. Breen further testified, in regard to MSW landfills that accept CRTs for disposal, that "EPA has found pH levels and leachate collection systems have kept contaminants from harming the environment." "If a landfill leachate collection system were to fail," he said, "the level of contaminants would rise to twice the level of national safe drinking water standards; however, these contaminants would be rendered harmless by being diluted." (*Daily Report for Executives*, BNA, July 21, 2005, at A-35). As shown by the environmental horror shows at "recycling" facilities in China and other developing countries, more environmental harm may have been created by enacting disposal bans on these materials before adequate recycling markets existed.

²¹ See *About Care*, CARPET AMERICA RECOVERY EFFORT, <http://www.carpetrecovery.org/about.php> (last visited Sept. 9, 2011).

²² California Assembly Bill No. 2398, Chapter 681, PSI (Sept. 9, 2011), http://productstewardship.us/associations/6596/files/ca_ab_2398_bill_carpet_gov_chaptered.pdf.

environment benefit when those products are recycled. However, many already have a very high recycling rate. According to EPA, for instance, newspapers have an 88 percent recycling rate, corrugated boxes an 81 percent recycling rate and office papers a 74 percent recycling rate.²³ Product stewardship laws are not likely to improve the recycling of products with already high recycling rates. Framework legislation, which could cover packaging and printed material, has been introduced in the Vermont and Rhode Island legislatures.

Before further expansion of these laws, legislators must carefully consider what problems they are trying to solve. If it is the cost of solid waste services, will product stewardship increase those costs or lower them? If it is environmental benefits, will consumer drop-off of individual products lead to more emissions than collection at the curbside? If it is collection at the curbside, how will those programs affect existing contractual and franchise collection systems?

Successful programs do not provide many answers. The thermostat stewardship organization, for instance, requires citizens to drop off thermostats at a collection center which then uses a mail-in system to return used thermostats. Automobile switch recovery relies on automobile dismantlers to take out the switch and send them to the collection agency. In both cases, the products are relatively small. Lead acid batteries are not covered by product stewardship laws, yet have the highest product recycling rate in America.²⁴ Recycling of these batteries is covered by a mishmash of laws in the 50 states. Some require a deposit when a new battery is purchased. Most ban disposal.²⁵ The high recycling rate is due, in part, to the ease of “giving up” a used battery when a new automobile battery is purchased.

6. Factors To Be Considered Before Expanding Product Stewardship Laws

Expanding product stewardship laws to commonly recycled, clearly non-hazardous products raises an immense number of practical implementation problems. Many of these issues will be unique to the United States because of the way that responsibility for solid waste management has evolved. The complexity involved extending product stewardship has been cited by proponents such as the Product Policy Institute which noted it is “simple in concept, complex in execution.”²⁶ In fact, the Resource Conservation Committee, a Congressionally authorized, Carter-era Task Force whose members included five Cabinet members and four Agency heads, made the same observation when assessing a much earlier form of product stewardship. For a variety of reasons, that Committee unanimously rejected the concept.²⁷ Until a thorough understanding of the requirements and costs of these programs is in place, prudence would seem to allow other countries to make their mistakes so that we can learn from their errors.

Factors to be considered before expanding to these non-hazardous products include the nature of a product stewardship organization for packaging and printed materials, the impact of such a law on traditional state and local responsibilities for solid waste management, the costs of

²³ EPA, *supra* note 11, at 82, 92.

²⁴ EPA, *supra* note 11, at 73.

²⁵ *Summary of U.S. State Lead-Acid Battery Laws*, BATTERY COUNCIL INTERNATIONAL, <http://www.batterycouncil.org/LeadAcidBatteries/BatteryRecycling/StateRecyclingLaws/tabid/120/Default.aspx> (last visiting Sept. 9, 2011).

²⁶ PRODUCT POLICY INSTITUTE, *supra* note 5

²⁷ United States, Resource Conservation Committee, *Choices for Conservation: final Report to the President and Congress*, 113-120, (EPA, 1980). (The RCC analyzed a national disposal charge, but the arguments in favor of the charge closely mirror those support product stewardship initiatives.)

the program including the potential for a regressive impact on lower income families, the necessity of a complete life cycle analysis of the impact of product stewardship and alternative approaches that could achieve similar results.

Adoption of the individual producer requirement in place of a product stewardship organization is unlikely considering the large number of companies that produce packages and printed materials and the extraordinarily high transaction costs and consumer confusion if each company was responsible for taking back its products. A product stewardship organization for packaging and printed material is likely to be far larger in scope than existing national organizations for automobile switches or thermostats or state electronics product organizations. Without careful oversight and full application of anti-trust laws, this group could engage in anti-competitive behavior, giving certain products or materials undue advantages over competitors. The organization's financial records and actions must be fully transparent.

These laws raise fundamental questions regarding final responsibility for solid waste management. Both the Resource Conservation and Recovery Act and the U.S. Supreme Court have stated that solid waste management is a traditional function of state and local governments.²⁸ At what point do the interests of a product stewardship organization override those of a local government? Maine's framework law, the only one enacted as of yet, specifically states that nothing in the law "is intended to change or limit municipal authority to regulate collection of solid waste including curbside collection of residential recyclable materials."²⁹ As anyone who has followed flow control litigation knows, local governments will not easily concede this authority to anyone, let alone a product stewardship organization.

Some opponents of product stewardship laws raise the impact of higher product costs on lower income families, noting that lower income families spend a higher percentage of their income on packaging and printed materials as opposed to more costly, durable products, than do higher income families. While this view is not unanimously accepted, further study is needed to avoid an unintentional impact on lower income families.³⁰

Before states or the Federal government adopt product stewardship requirements on traditional recyclables, prudence would seem to require a complete life cycle impact analysis of such a proposal, which would include the impacts of collection, including drop-off and curbside collection of these materials. An expansion to a much larger group of products would seem to warrant such analysis. Analysis of system costs, including the cost of operating a product stewardship organization and its impact on overall resource management costs, is also appropriate.

²⁸ Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901 et seq. (1976). See for instance, § 6901(4), Congressional finding of fact concerning state, local and Federal roles and *United Haulers Ass'n v. Oneida-Herkimer Solid Waste Mgmt. Auth.*, 127 S. Ct. 1786, 1796 (U.S. 2007).

²⁹ ME. REV. STAT. TIT. 38, § 1, c. 18, sec 1774.

³⁰ See David Tonjes, Comment, *Draft Generic Environmental Impact Statement (DGEIS) supporting Beyond Waste: A Sustainable Materials Management Strategy for New York*, 47-48 (Aug. 9, 2010). Grocery Manufacturers Association which estimated that product stewardship of consumer packaging would impose a minimum cost of \$7.7 billion per year on the packaging industry with a maximum potential cost of \$21 billion per year. (John Shanahan, Presentation, *Packaging and Sustainable Management*, Resource Recycling Conference, Indianapolis, Indiana (Aug. 17, 2011)). However, the Resource Conservation Committee did not find the earlier version of product stewardship to be regressive. RCC, *supra*, at 118.

Less costly, more effective alternatives to product stewardship should also be considered. Requiring residences to pay for solid waste services through “pay-as-you-throw” systems in which a householder is billed for solid waste services based on the amount of material set out for disposal has been shown to be highly effective in lowering single family disposal and increasing the amount set out for recycling.³¹

If the goal of product stewardship is to eliminate toxic materials, that goal can be achieved legislatively. An obvious success story in toxics reduction is the prohibition of lead in paint, which removed a highly toxic material from that product. Another success story is the Model Toxics in Packaging Legislation developed by the Council of Northeastern Governors. This legislation mandated reductions in the amount of mercury, lead, cadmium and hexavalent chromium in packages components. Adopted by 18 states by 1998, the law which aims to phase out the use of these substances, is in effect nationwide for all practical purposes.³² The European Union’s European Restriction of Hazardous Substances Directives (RoHS) has spurred electronics manufacturers to change their production practices and find substitutes for banned substances.³³ This approach achieves the goal of reducing or eliminating toxicity without the bureaucracy or cost of a product stewardship organization.

In his comprehensive analysis of product stewardship laws, Noah Sachs offers a number of alternatives to product stewardship laws as elements of a U.S. product policy. The first is advance recycling fees, the approach adopted in California for electronic product recovery. Sachs argues advance recycling fees will solve the cash problem for local governments.³⁴ He also supports bans on hazardous substances in products, he notes the value of increased use of ecolabels, government procurement standards, and “identifying those product classes which pose the greatest environmental impacts from production or disposal and then determine which party is in the best position, taking into account transaction costs, to fund and improve recycling infrastructures: consumers, taxpayers/municipalities, or perhaps, producers funding recycling efforts on a collective basis.”³⁵

Interest in product stewardship legislation seems to have slowed down in 2011. Perhaps this is due to pressure on state legislators from higher priority issues including state budgets, reapportionment, health care and infrastructure maintenance. Congress might take action regarding exports of electronics to overseas recycling facilities due to the intense negative publicity about some of these operations. HR 2284, the “Responsible Electronics Recycling Act” (Green, D-TX), would restrict exports of shredded electronics products. Although the bill has bipartisan support, as of this writing, a hearing has not been scheduled. Electronics product manufacturers have noted the inherent inefficiencies and confusion caused by operating under a variety of differing state product stewardship laws.³⁶ Electronics recyclers are also unhappy about the extra cost of complying with differing state laws. However, Congress is unlikely to resolve this issue until manufacturers, retailers and product stewardship advocates agree on uniform legislation.

³¹ *Pay-As-You-Throw*, EPA, <http://www.epa.gov/epawaste/conserve/tools/payt/index.htm> (last visited Sept. 9, 2011). EPA’s web page on pay-as-you throw systems offers a wealth of information on this option.

³² See *Other Issues of Interest*, CONEG, <http://www.coneg.org/programs/other.htm> (last visited Sept. 9, 2011).

³³ Sachs, *supra* note 4, at 93.

³⁴ Sachs, *supra* note 4, at 95-96.

³⁵ Sachs, *supra* note 4, at 91-92.

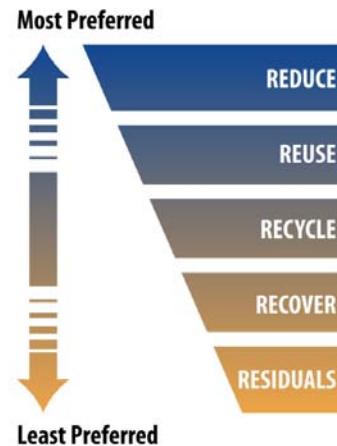
³⁶ *A Study of the State-by-State E-waste Patchwork*, NCER, October 2006

Nonetheless, interest in this legislation will not go away. We should take advantage of this lull to further investigate the results of product stewardship initiatives in Europe and Canada, develop a better understanding of their true costs on consumers and taxpayers, and determine if they will indeed solve America's resource and waste management challenges. As David Tonjes noted, arguments in favor of product stewardship are based on more theory than fact.³⁷ Let's get the facts first.

³⁷ WASTE EXPO, DALLAS TEXAS, *A Critical Analysis of Extended Producer Responsibility*, (May 10, 2011).

Source Reduction Definitions/Framework/Options

Source reduction activities reduce the amount of materials entering the waste stream and are considered the most preferred waste management approaches under the USEPA, NDEQ and City-County hierarchy. Source reduction includes conservation, waste reduction, and material reuse. Most waste reduction activities require the individual residences, businesses and governments to take steps to adopt or change their way of thinking of waste and their waste generating and disposal habits. The recommendations and programs resulting from the Solid Waste Plan 2040 can encourage, support and provide additional opportunities for changes in thinking and waste generation/management habits by implementing programs that target source reduction practices as described below and in other related technical evaluations.



Definitions

There are many definitions of Source Reduction. The USEPA states “**Source Reduction** refers to any change in the design, manufacture, purchase, or use of materials or products (including packaging) to reduce their amount or toxicity before they become municipal solid waste. Source reduction also refers to the **reuse** of products or materials.” Within the content of other related technical evaluations additional definitions are provided to describe various waste and source reduction programs including the following:

- Zero Waste
- Product Stewardship
- Household Hazardous Waste

As defined by the Grass Roots Recycling Network, **Zero Waste** includes “recycling” but goes beyond to address the reduction of “upstream” waste created through mining, extraction, and manufacturing of products. Zero waste maximizes recycling, minimizes waste, reduces consumption and encourages the development of products that are made to be reused, repaired or recycled back into nature or the marketplace.

The Product Stewardship Institute (PSI) defines **product stewardship** as the act of minimizing health, safety, environmental and social impacts and maximizing economic benefits of a product and its packaging throughout all lifecycle stages. The PSI further defines **extended producer responsibility** (EPR) as a mandatory type of product stewardship that includes, at a minimum, the requirement that the producer’s responsibility for their product extend to post-consumer management of the product and its packaging.

Framework

In the United States today, two topics with significant emphasis on source reduction include the philosophy and design principle associated with zero waste and product stewardship. These principles contain conservation and recovery principles very similar to those embodied in the 1976 federal Resource Conservation and Recovery Act (RCRA), which set national goals to:

1. To protect human health and the environment from the potential hazards of waste disposal
2. To conserve energy and natural resources
3. To reduce the amount of waste generated
4. To ensure that wastes are managed in an environmentally sound manner

As an overarching concept, Zero Waste encompasses all waste reduction, as well as reuse, recycling, and diversion options. Product Stewardship focuses on minimizing health, safety, environmental and social impacts and maximizing economic benefits of a product and its packaging throughout all lifecycle stages.

The City-County currently support a wide range of public and private waste reduction programs for source reduction. These efforts may be best illustrated in the *Lincoln-Lancaster County's Official 2012 Waste Reduction & Recycling Guide*, and through the following websites and related links:

- City's Solid Waste Operation's website
<http://lincoln.ne.gov/city/pworks/waste/sldwaste/>
- Lincoln-Lancaster County Health Department's website
<http://lincoln.ne.gov/city/health/environ/pollu/index.htm>

Options

Throughout the development of the Solid Waste Plan 2040 there will be evaluations of a wide range of system, facilities and program options and alternatives. Based on the nature of the topics to be considered and evaluated many of these topics overlap other source reduction considerations. For example, education programs can encourage source reduction and recycling, identify options for waste toxicity reduction, provide information on safe and proper waste disposal, and serve as a basic decision making resource for understanding waste management alternatives.

Many of the available source reduction programs are based on dealing with wastes after they are generated (avoiding disposal and reducing toxicity). A key part of the overall diversion and minimization effort involves educating consumers and waste generators about options to avoid, prevent or minimize waste generation. The concept of source reduction is equally important for household hazardous waste and commercial/industrial/institutional materials. Source reduction and alternative management options occur through both public and private efforts, as illustrated in the *Lincoln-Lancaster County's Official 2012 Waste Reduction & Recycling Guide*.

There are a wide range of source reduction options. The following are considered basic options associated with Source Reduction. Other topical evaluations will provide greater detail on various related and overlapping programs and options. These can generally be grouped into the following broad categories:

- Education
- System, Facilities and Program Alternatives
- Purchasing Practices
- Bans and Restrictions
- Incentives

The Needs Assessment provides greater detail on existing source reduction programs. The following overview is intended to highlight general types of source reduction options. Again, it is

important to recognize that there are a wide range of existing and potential future options, and not all are included below.

Education

A key part of the overall diversion and minimization effort is educating consumers on options to avoid or minimize waste generation and disposal; additional efforts focus on changing behavioral patterns and the way people and businesses think (sustainable materials management). The success of source reduction programs is dependent on continuous education of the public and businesses. Education is important to any consumer-targeted source reduction and recycling program.

Successful education programs are generally geared toward multi-media education efforts and providing training and hands-on education. Major components of such programs typically include:

- **Program Awareness:** education programs that increase the public and businesses knowledge and understanding of available programs, as well as various waste reduction techniques and solid waste diversion options
- **Management Alternatives:** education programs that target reduce and reuse options, consumer alternatives, sustainable materials management, toxicity reduction, and short- and long-term behavioral changes. These include programs that address hazardous waste reduction, substitutes for hazardous products, and appropriate and safe methods for management or disposal
- **Waste Reduction:** programs that target specific waste reduction practices such as “Don’t bag it” or “Let it lie” (that discourage collection/bagging of lawn waste), or backyard composting of lawn waste

Systems, Facilities and Programs

Beyond the educational effort, opportunities (systems, facilities and programs) must exist to divert and avoid disposal of materials that might otherwise become waste. With more than half of the municipal solid waste (MSW) generated in the Planning Area estimated to come from non-residential sources it is important that these opportunities exist for both residents as well as businesses (the commercial/industrial/institutional) community.

Programs may include educational components and waste audits, but ultimately need to include systems and facilities to provide for diversion opportunities. These systems and facilities include sites, equipment, structures, and personnel utilized for the purpose of collection, storage, transportation, transfer, processing, and treatment of diverted materials. Again, many such systems, facilities and programs exist in public, private and public/private partnerships within the Planning Area. Some simple examples include: charitable re-use options, material exchanges and reuse facilities and buy-back centers, as well as the wide range of retail and take-back facilities, as listed on pages 6 and 7 of the [Lincoln-Lancaster County’s Official 2012 Waste Reduction & Recycling Guide](#).

Purchasing Practices

There is a wide variety of source reduction practices focused on purchasing practices geared toward generating less waste, in part by increasing product efficiency and effectiveness. Some of these are embodied in product stewardship and environmentally preferred purchasing strategies. Such strategies can be voluntary or mandatory (e.g., embedded in business or government purchasing policies). Keep America Beautiful (KAB) lists the following source

reduction related purchasing practices; KAB attributes this list to the National Recycling Coalition:

1. Rent or lease products or equipment.
2. Purchase rebuilt, remanufactured or refurbished products.
3. Purchase more durable products.
4. Purchase products containing nonhazardous materials.
5. Purchase products that are reusable, refillable, or returnable.
6. Purchase products in bulk.
7. Purchase products with less packaging or reuse packaging.

In the case of Lincoln this could include the purchase of City produced compost (LinGro). A significant aspect of the source reduction also attempts to focus consumers on the idea of purchase of durable, as opposed to non-durable goods, when given an option.

Bans and Restrictions

Whereas educational initiative generally focuses on voluntary participation, legislation can also be used to mandate changes. Federal, state and some local legislation/ordinances can be used to accelerate the implementation of source reduction programs. Legislation/ordinance can also have unforeseen side effects and will need be considered carefully.

Bans and restriction are an indirect means of providing source reduction. They do not necessarily reduce waste but rather use legislation to change management options and possibly purchasing practices. In Nebraska certain materials are banned from landfill disposal (e.g., tires, waste oils, lead acid batteries, appliances, and yard waste). In addition, Lincoln businesses are not allowed to dispose of hazardous waste in the landfill. These do not necessarily reduce waste generation but create the need for alternate management approaches, which often include recycling and reuse. Bans on tires, batteries and appliances do not serve to decrease the quantity of materials purchased or the need for end-of life management. However, seasonal landfill bans on yard waste (lawn waste) have created some interesting dynamics in the waste management industry.

Seasonal yard waste bans have created the need for separate collection and management systems for those individuals that choose to collect and “bag” their lawn waste; in the Planning Area this management need has been addressed in part by the City’s construction of a large scale composting facility at the Bluff Road Landfill and the separate material receiving and handling facilities at the City’s N. 48th Street Landfill, along with the need for post-composting marketing and utilization of the resultant product (marketed as LinGro Compost). In the Planning Area private haulers will collect and transport the grass and leaves to composting facilities for a fee; once collected they can also haul them to certain landfills outside of Lancaster County for disposal, if the facility has an active landfill gas utilization program. Source reduction strategies for lawn waste, while focused on reduction at the source (e.g., “Don’t Bag It”) also recognize the need for non-disposal management options within the Planning Area.

Incentives

Incentive and penalty systems are another indirect means of providing source reduction. They do not necessarily reduce waste but rather change management options and possibly disposal practices. While most incentive programs focus on financial incentives, there are other types of incentive programs, such as recognition programs.

Some examples of incentive programs include:

- **Rate Structures:** such as of “pay as you throw”, “volume based” rate structures and extended producer responsibility laws. In rate structure type of systems, waste generators pay a monthly fee that increases as the volume, or weight of disposed waste increases with a goal of allowing the waste generator to see a direct relationship between the amount they discard and the cost for collection service. Research on pay as you throw programs suggests that in addition to increasing recycling rates that such programs have resulted in a removal of 6 percent of the residential waste stream by source reduction (Including buying in bulk, buying items with less packaging, donating of reusable goods to charities). This concept is largely already in place for commercial/industrial and institutional waste generators. These can apply to typical MSW as well as material such as yard waste. If fact, under the current Planning Area collection system, if you choose to have collected yard waste removed from your residence or business you typically pay an added fee (pay as you throw). The extent to which this is volume based has not been determined. Under the extended producer responsibility laws the cost of such take back or end of life cost has been included in the initial purchase price.
- **Grants:** available state grant programs focus helping communities implement and maintain waste reduction and recycling programs, including funding household hazardous materials management systems. Grant programs could also be constructed by the City to encourage development of new product markets or help businesses implement systems, facilities and programs targeting source reduction.
- **Subsidies or Incentives:** such as convenience facilities for recyclables, support to diversion events (e.g., electronics or HHW drop-off) or to support operations of HHW programs.
- **Mandated Recycling:** Recently a select group of communities in the US have developed policies and programs that require residential waste recycling and include penalties (e.g., fines and lack of garbage pick-up) for those who do not recycle or include recyclable materials in their waste. Mandated recycling/diversion can also include recovery and diversion requirements associated with demolition or construction projects, especially projects that utilize public funds. Where mandated recycling is required for construction demolition projects they generally require submission of a waste management plan, as part of the permitting process.

Summary

Source reduction activities reduce the amount of materials entering the waste stream and are considered the highest ranking waste management approach under the USEPA, NDEQ and City-County hierarchy. Most waste reduction activities require the individual residences, businesses and governmental institutions to take steps to adopt or change their way of thinking of waste and their waste generating and disposal related habits; these typically involve an educational or promotional component. Other waste reduction activities use economic measures (e.g., purchasing practices, subsidies, take back programs) to further incentivize waste minimization, toxicity reduction and producer responsibility. The recommendations and programs resulting from the Solid Waste Plan 2040 can encourage these changes in habits by implementing programs that target a wide array of source reduction practices. Programs for source reduction should target residential waste, as well as potential wastes from the business, industry and institutional community. They can be mandatory or voluntary. To be effective they will likely need to consider broad perspective approaches such as zero waste and product stewardship and specific material focused programs such as HHW and lawn waste.

Zero Waste

Overview

Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use.

As defined by the Grass Roots Recycling Network, Zero Waste is a philosophy and a design principle for the 21st Century. It includes “recycling” but goes beyond to address the reduction of “upstream” waste created through mining, extraction, and manufacturing of products. Zero waste maximizes recycling, minimizes waste, reduces consumption and encourages the development of products that are made to be reused, repaired or recycled back into nature or the marketplace.

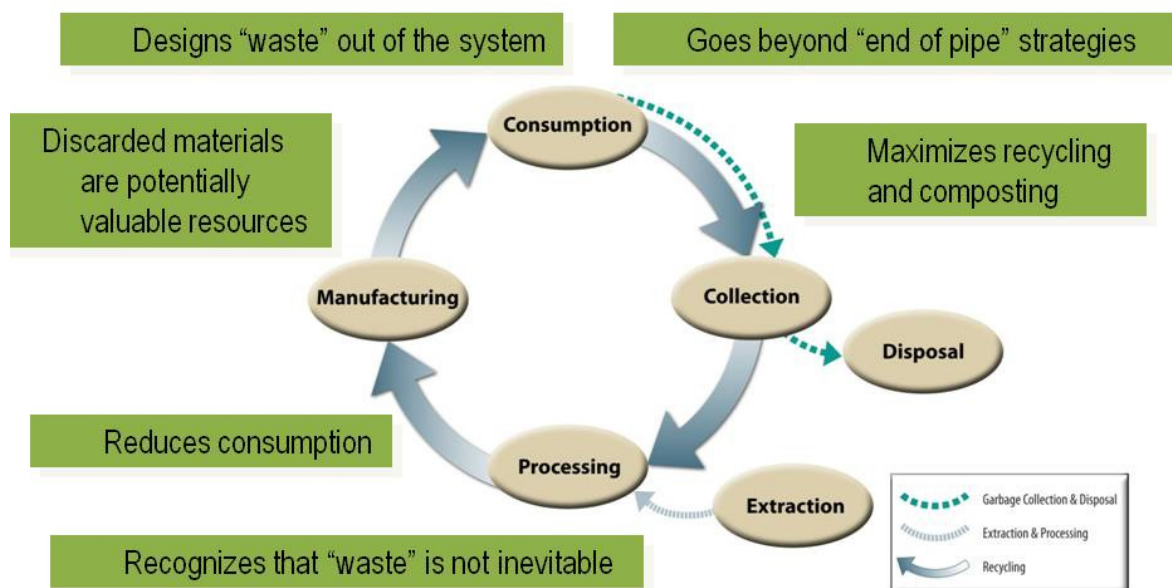
Zero waste:

- Recognizes that “waste” is not inevitable
- Discarded materials are potentially valuable resources
- Goes beyond “end of the line” strategies
- Maximizes recycling and composting
- Reduces materials consumption

(Source: City of Los Angeles is developing the Solid Waste Integrated Resources Plan, http://www.zerowaste.lacity.org/files/info/fact_sheet/SWIRPFAQS.pdf Retrieved 09/29/2011)

It is an overarching concept that encompasses all waste reduction and diversion options. Certain components of this philosophy are more easily implemented at a local governmental level; others, involve large scale societal and industrial changes in such things as mining and manufacturing. Advocates for zero waste acknowledge that there will likely always be some waste that will require disposal. Figure 1 is a graphic illustration developed from several other zero waste plans prepared by HDR Engineering, Inc (HDR).

Figure 1 - What is Zero Waste



Components of the zero waste concept will be discussed in other topical papers including those on:

- Source Reduction
- Product Stewardship
- Household Hazardous Waste (HHW)
- Recycling
- Organics Composting
- Yard Waste Management
- Waste Conversion Technologies

Current Programs

Within the Planning Area there are a wide range of programs that would be considered a part of the zero waste strategy/plan. This includes programs that target waste reduction, recycling and composting, hazardous materials reduction and diversion, as well reduction in material consumption. These programs include both physical facilities as well as educational initiatives. Examples of City/County programs include:

- public drop-off recycling centers
- lawn waste composting
- wood waste management
- household hazardous material collection events
- various education initiatives (publications, website, educational tours, etc.)
- support to private initiatives

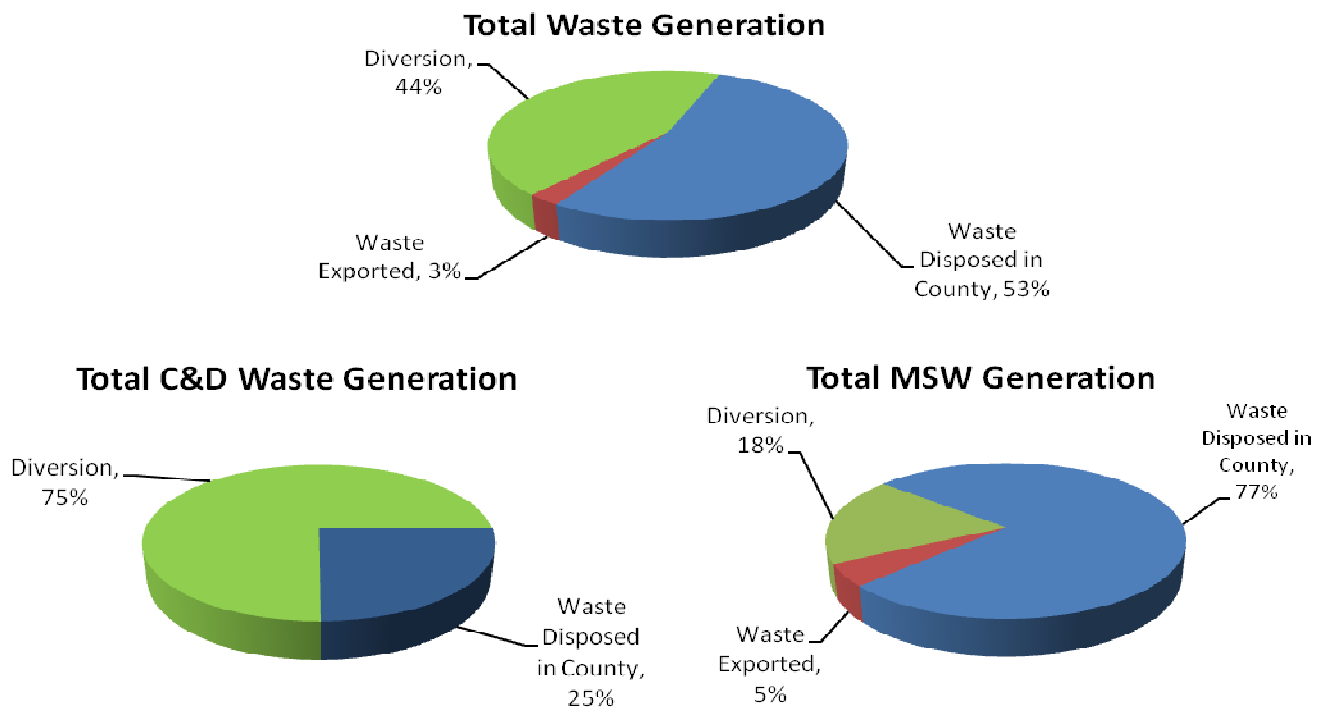
Private business also offers a variety of programs including:

- Curbside recycling for residents and recyclables collection services business (subscription based)
- Buyback centers
- There are also private firms that will accept and recycle or provide for proper management of the following potentially discards items:
 - Appliances
 - Automobiles
 - Automobile batteries
 - Rechargeable batteries
 - Button batteries
 - Computer equipment
 - Clean asphalt and concrete
 - Compact florescent bulbs
 - Fire extinguishers
 - Hearing aids
 - Oil
 - Tires
 - Plastic grocery bags
 - Plastic Pharmacy bottles
 - Propane tanks
 - Televisions
 - Toner cartridges
 - Wood waste
 - Metal cans

Generation and Diversion

It is estimated that approximately 77 percent of the municipal solid waste (MSW) generated in the Planning Area (which excludes construction and demolition waste) is disposed in the Bluff Road Landfill, another 5 percent of the MSW is exported to out-of-county landfills and the remaining 18 percent is diverted by reuse, recycling, composting or related techniques (see Figure 2). This may underestimate the diversion rate since there is no reliable source of information to estimate the rate of reuse (e.g., materials that never enter the stream of materials requiring management as a waste product).

Figure 2 - 2011 Waste Disposal and Diversion, by Percentage



If the quantities of the construction and demolition waste (e.g., concrete, asphalt) are considered as part of the “total waste generation”, then approximately 53 percent of the generated waste is disposed in City landfills, another 3 percent is exported to out-of-county landfills, and the remaining 44 percent is diverted by reuse, recycling, composting or related techniques.

Although C/D waste diversion efforts have made great strides in the past two decades, there are still opportunities for increased diversion. Options for increasing MSW and C/D diversion will be key areas of focus in the planning effort.

Program (Facility/System) Options

Zero waste initiatives include the following:

- Waste reduction at the source of generation (Source Reduction)
- Changes in manufacturing design to enhance recycling and reuse (Product Stewardship)
- Producer responsibility at the end of product life (Extended Producer Responsibility)
- Consumer responsibility in product selection (Consumer awareness)
- Program opportunities for material recovery and diversion rather than disposal (Recycling/composting)
- Markets for materials recovered for society’s discards (Market development)
- Changes in purchasing practices that can be viewed as inhibiting the reuse of recovered materials (Modification of procurement specifications)
- Energy and resource recovery, as well as volume reduction (Conversion technologies)

Many of these initiatives will be discussed in more detail as separate topics as part of the planning process. There are many different initiatives underway nationwide and worldwide. While reduce, reuse and recycle are important resource conservation practices and reduction

options, they only represent a fraction of all the opportunities available to conserve resources. The USEPA provides additional ideas in their Sustainable Materials Management website (<http://www.epa.gov/wastes/conserve/smm/index.htm>).

Some of the zero waste ideas that may deserve further consideration in the Solid Waste Plan 2040 planning effort include the follows:

- Better establish and promote Solid Waste Program information as it relates to Source Reduction
- Expand education in the schools, businesses and institutions
- Increase Waste Audits to Planning Area businesses
- Expansion of Material Reuse Center/Waste Exchange, including such items as: construction materials, household furnishings and cleaning supplies
- Development/Expansion of ReUse Centers to help provide a second-life option for various materials (e.g. used electronics, building material) currently targeted for disposal
- Increased Special Waste Diversion Programs for items such as Electronics and Medical Wastes
- Increase residential recycling
- Increase commercial, institutional and industrial recycling
- Develop composting capacity for other organic waste
- Institute bans on materials that have significant resource value and that may be difficult to recycle or pose problems with disposal
- Target programs to reduce the quantity of plastics in the waste stream, especially film plastics and single use containers
- Promote Product Stewardship and Extended Producer Responsibility legislation
- Mandate and/or Incentivize Recycling programs, such as:
 - Volume-based waste collection programs to provide additional price based incentive to encourage more waste reduction and recycling
 - Pay-as-you-throw rate structures for yard waste to encourage reduction
 - Requiring recycling services be universally available to all waste generators in the Planning Area (residential, commercial, industrial and institutional generators)
- Strategies to improve local markets for recyclable and composted materials
- Promote purchasing policies that minimize waste

Options Evaluation

As noted above, most of the options that might be implemented at a local (Planning Area) level will be addressed in separate evaluations. Also, because zero waste encompasses a holistic approach to waste, with strategies and principles that encompass changing lifestyles and societal changes and go beyond recycling to address the reduction of “upstream” waste created through mining, extraction, and manufacturing of products, they are not easily evaluated based on the criteria established for use in the Solid Waste Plan 2040 planning process (e.g., technical requirements, environmental impacts, economics, implementation/viability). These criteria will be applied, as appropriate to individual system, facility and program options, which may be components of zero waste, considered in other evaluation topic papers (e.g., source reduction, recycling, yard waste, etc.).

Again, it is important to emphasize that zero waste is an overarching concept that encompasses all waste diversion options.

Relationship to Guiding Principles and Goals

As it relates to the Guiding Principles and Goals of the Solid Waste Plan 2040, zero waste would be directly applicable as further noted below:

- Emphasize the waste management hierarchy: zero waste is directly related to the waste management hierarchy in that it places maximum emphasis on reduce, reuse, recycle and would employ recovery to avoid or prevent the need to generate and manage residuals.
- Encourage public/private partnerships: zero waste requires participation by both public and private stakeholders, nationally, state-wide and locally.
- Ensure system capacity: zero waste requires the necessary infrastructure and system approaches to ensure that material will not be discarded and can be recycled and composted and returned to beneficial use. It goes beyond the end of the line disposal.
- Engage the community: zero waste requires an engaged community because it ultimately seeks to change the current management/disposal ethos by including lifestyles and societal changes.
- Embrace sustainable principles: zero waste is based on sustainability principles in emphasizing that waste is not inevitable and in considering environmental, economic, and social dimensions in managing and using resources.

Summary

Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Zero Waste is a philosophy and a design principle that maximizes recycling, minimizes waste, reduces consumption and encourages the development of products that are made to be reused, repaired or recycled back into nature or the marketplace. It is an overarching concept that encompasses all waste diversion options, many of which will be addressed as separate topical discussion in the development of the Solid Waste Plan 2040. Certain components of this philosophy are more easily implemented at a local governmental level; others, involve large scale societal and industrial changes in such things as mining and manufacturing.

Household Hazardous & Conditionally-Exempt Small Quantity Generator (Small Business) Hazardous Waste

Overview

Federal and state laws have strict requirements for storage, handling and disposal of hazardous waste. However, federal law provides an exemption from these rules for household hazardous waste (HHW), and allows disposal of HHW in a municipal waste landfill. Businesses and industries that monthly generate less than 220 pounds (100kg) of hazardous waste and 2.2 pounds (1 kg) acute hazardous waste (and subject to certain requirements) are considered conditionally exempt small quantity generators (CESQG) and are allowed by Federal law, based on certain limitations, to be disposed of in a municipal waste landfill. However, local laws are more stringent than Federal law. During the citing process for the Bluff Road Landfill, the City of Lincoln decided that it was in the best interests of the City and the environment to reduce the disposal of hazardous wastes in the Bluff Road Landfill. The City put in place programs focused on toxicity/risk reduction, including the Special Waste Program (described in greater detail in the paper on Universal, Special and Unique Wastes), the Household Hazardous Waste Collection Program, and the CESQG waste collections program.

HHW includes leftover household products which contain ignitable, corrosive, chemically reactive or toxic ingredients. Examples of HHW include but are not limited to: lawn and garden chemicals, pesticides, automotive fluids, batteries, cleaning agents, solvents, mercury containing products, and oil based paints. Improperly managed HHW can pose a threat to human health (i.e. cause injury to sanitation workers, children or family pets, and others that might handle the products) and the environment. Diverting HHW from the solid waste stream, along with proper management, can mitigate these risks and reduce the toxicity of the waste stream. Many communities across the United States, including Lincoln-Lancaster County provide programs to allow members of their community to safely manage HHW. Household participation in any HHW program can be significantly influenced by convenience and level of public education outreach.

Current Programs

The Lincoln-Lancaster County Health Department (LLCHD) coordinates programs for toxics reduction/hazardous materials management for households and small businesses. These programs include but are not limited to community education (focused on choosing least toxic alternatives and buying only the amount needed) and an annual series of hazardous waste collection events for households and small businesses (CESQG). The HHW events are typically scheduled from March through November, and currently include two (2) by appointment only events. The LLCHD also shares responsibility with Aging Partners for oversight of the *Safe Homes for Seniors* service that provides in-home household hazardous waste assessments, sorting and proper disposal for seniors and other home-bound populations. A more detailed description of these programs is included as an Appendix. The City also provides for management of certain hazardous materials at its North 48th Street Landfill, where it accepts used motor oil, batteries and has a program for removal of hazardous components from appliances, as part of its appliance demanufacturing facility. Other private industries provide hazardous materials management through programs that reuse, recycle or otherwise properly manage batteries, computer components, oils, latex paints, compact fluorescent light bulbs, devices containing mercury and others. The City and County also provide educational tools and support to help members of the community identify and choose less toxic alternatives and proper management methods. A more detailed list of local options can be

found in the *Lincoln-Lancaster County's Official 2012 Waste Reduction & Recycling Guide*, and through the following websites and related links:

- City's Solid Waste Operation's website
<http://lincoln.ne.gov/city/pworks/waste/sldwaste/>
- Lincoln-Lancaster County Health Department's website
<http://lincoln.ne.gov/city/health/envIRON/pollu/index.htm>

The LLCHD has identified a goal that 90 percent of Lincoln and Lancaster County Planning Area (Planning Area) small businesses/CESQGs have access to the program and that the program serves at least 30 small businesses and agencies each year, with an added goal of diverting at least 7.5 tons of hazardous waste annually. Participating businesses pay the cost for waste disposal and the balance of the costs are paid from refuse hauler occupation tax and State grants. Participants see a benefit in this program because it reduces their overall costs, including the costs for arranging disposal and actual disposal cost (because it takes advantage of a LLCHD volume based disposal rate). There are only two CESQG events per year, which means that they may not always be convenient and accessible to Planning Area businesses and agencies; this may be a significant limiting factor in program participation rates and the quantities of waste that is managed through this program.

As further described below, the LLCHD-coordinated HHW events program divert an average of 40 tons per year of HHW. These are major events often attracting as many as 620 cars in 4 hours. These events rely heavily on volunteers and the partner business, and represent a significant staffing challenge as they require specialized personnel including trained chemists, specialized waste handlers, and personnel with extensive safety training (to handle the wide variety of materials), as well as the uncertainties associated with some materials collected. While the volunteers are considered a net cost savings, the LLCHD makes a significant investment in recruiting, coordinating, and training volunteers.

LLCHD personnel have identified the largest challenges to this program as:

- Accessibility
- Management
- Safety
- Public Education/Behavior Change

Accessibility. With a limited number of HHW collection events, access is limited by such factors as convenience and location. Often the need for this disposal option may not coincide with the event generating the waste (e.g., moving, house cleaning) or may not be accessible to people who are homebound, must work during the time of the event, or for other reasons cannot take advantage of the opportunity when the need exists. LLCHD estimates that the current program is utilized by less than 3 percent of the community households per year.

Management. Challenges relate to: the nature of coordinating mobile events; coordinating volunteers; specific in-field challenges (e.g., chemical or physical assessment of materials collected, highly variable quantities received); traffic and space limitations to safely receive, sort and store materials; and, weather risks. Challenges and cost considerations also arise when the material received do not equal a full barrel or container, but must be shipped off of the collection event site.

Safety. Challenges include: assessing and handling chemicals in a parking lot (out-door working conditions/environment); safety concerns for volunteers; risk management requirements; training costs; and, the high intensity (large volume; short duration) nature of mobile HHW collection events. LLCHD has protocols and programs to ensure these matters are effectively managed.

Public Education/Behavior Change. Challenging yet critical to an effective and efficient toxics reduction program is education, which results in behavioral changes. If the target population and/or businesses that stand to participate and benefit from the program are not aware of it or know how to fully utilize associated services then the participation rates are lower. The ability to meet specific waste reduction goals is inhibited and risks to public health and the environment are greater with low participation rates. Community behavior change is dependent on removing barriers, creating incentives and disincentives, and implementing behavioral science strategies proven to work at the community level.

Excluding the value of volunteer time and participation by corporate partners, the cost of these programs in fiscal year 2011 were paid for from the following sources:

- Grants: 17 percent
- Occupation Tax: 83 percent

There is no data available to accurately quantify the amount or cost of HHW material diverted through private industries and businesses initiatives.

Generation and Diversion

HHW is a relatively small proportion of the municipal solid waste disposed at landfills. The California Statewide Waste Characterization Study, 2008 estimated HHW to be approximately 0.3 percent of the municipal solid waste (MSW) stream disposed; Vermont's 2002 Waste Composition Study, concluded that HHW constitutes 0.6 percent of the MSW destined for disposal. The NDEQ conducted a series of waste composition studies in 2007 and 2008. The portion of the study conducted at the City's Bluff Road Landfill showed 0.02 percent of waste stream was HHW – this excluded electronic waste (0.41 percent), and dry cell batteries (0.08 percent). This totals 0.51 percent of Lincoln's MSW that may be considered HHW. Table 1 provides a summary of quantities of HHW materials collected at the LLCHD HHW events over the past 11 years and the technique employed to manage or dispose of these materials. This represents an average collection rate of approximately 40 tons per year, with approximately 50 percent diverted from disposal. LLCHD does not accept used oil or electronics in their HHW collection program because private businesses provides a management alternative for these materials. The City does accept used oil at its North 48th Street Transfer Station. LLCHD also does not accept latex paint (because it is not a hazardous waste) and other wastes readily recycled through local firms.

Table 1 – Pounds of HHW Collected Per Year

Year	Recyclables	Fuels Blending	Incinerable	Landfill	Totals
2001	34,760	19,037	21,452	681	75,930
2002	2,341	35,161	29,071	385	66,958
2003	7,472	37,083	32,487	1,235	78,277
2004	21,246	36,570	33,667	364	91,847
2005	3,931	26,858	29,179	1,553	61,521
2006	6,664	28,604	23,046	2,447	60,761
2007	7,013	37,209	44,144	1,194	89,560
2008	50,058	17,444	72,963	-	140,465
2009	4,325	13,558	59,285	37	77,205
2010	3,615	12,394	53,374	-	69,383
2011	4,065	35,974	44,571	-	84,610
Totals	145,490	299,892	443,239	7,896	896,517
Total Tons	72.75	149.95	221.62	3.95	448.26

Based on an assumption that between 0.3 and 0.6 percent of the MSW is HHW, it is estimated that between 900 tons and 1,800 tons of HHW are currently generated in the Planning Area or approximately 20 to 40 times the amount historically collected through the LLCHD coordinated collection events. Again, the amounts of HHW materials received and managed by private businesses are unknown.

Program (Facility/System) Options

There are several system, facility and program options for HHW diversion from the solid waste stream. Among the most common approaches are the following:

- **Periodic or Mobile collection events.** This is the system currently used in the Planning Area - Status Quo. While this is often called a mobile event there are also less common systems that provide vehicles that collect material on an “as-requested” basis. Such mobile vehicle systems are considered costly as a primary program type, based on the total quantity diverted and are not addressed in this paper.
- **Home-based collection.** This type of system is also currently used to a limited extent in the Planning Area. The *Safe Homes for Seniors* service allows for the assessment, sorting, removal and proper disposal of HHW directly from the homes of area seniors participating in Aging Partners programs and other home-bound populations. Large scale home based collection events have been shown to be very costly.
- **Local business collection sites.** This type of system is also currently used in the Planning Area (Status Quo). These types of systems often target single material types (e.g., oil, batteries, and electronics). Some may also be aligned with point-of-purchase facilities. Local business collection sites may also correspond to producer responsibility option as further described under a separate paper on Product Stewardship.
- **Permanent facility(s).** This exists to a limited extent with the City’s North 48th Street Transfer Station; this facility only takes materials banned from landfill disposal, specifically motor oil, batteries and appliances.

Effective HHW programs often use more than one such system to maximize diversion and address inherent limitations with any one program type.

Permanent HHW collection facilities are fairly common in larger communities in the Midwestern region including Omaha, NE; Sioux Falls, SD; Minneapolis/Hennepin County, MN; Des Moines, IA; Council Bluffs, IA; Kansas City, MO; and, Wichita, KS. Permanent facilities typically have scheduled days and hours of operation, but some smaller facilities may function as appointment only, due to staffing considerations and safety issues. Some HHW facilities are co-located with other solid waste management facilities/functions, others are stand-alone facilities. Besides material handling and storage areas, facility features and options often include covered canopy unloading area, limited laboratories, materials exchange/reuse center, office space, and education areas.

In Nebraska, five jurisdictions are known to have permanent HHW collection facilities: these include the cities of Holdrege, Kearney, North Platte, and Omaha, and Red Willow County. Permanent facilities in other Nebraska communities are also known to be under development. The Holdrege facility serves four counties with a mobile collection trailer.

Some permanent HHW facility programs accept CESQG hazardous materials with designated operating day(s) or hours reserved for CESQG appointments. Allowing CESQG access to a HHW facility typically provides businesses a lower cost option for hazardous wastes disposal and may represent an optional source of revenue.

The 1994 Lincoln-Lancaster County Solid Waste Management Plan (1994 Plan) recommended building a modest, accessible household hazardous waste collection facility in the Phase II recommendations. The 1994 Plan recommendations also included the possibility of charging fees to businesses utilizing the facility to cover all costs for their waste disposal and a portion of the cost for operating the facility.

Another option which has been discussed with LLCHD and the NDEQ is construction of permanent HHW facility that would serve as a regional hub to accept HHW from periodic or special collection events that might be collected in adjacent counties or as part of events located in rural areas.

Options Evaluation

The advantages of any toxics reduction, HHW or CESQG program are protection of human health and the environment, and extend to conservation of resources, cost savings, reduced generation (largely through education), and proper disposal (which prevents pollution).

The general issues associate with periodic or mobile collection events are largely discussed above and include issue of accessibility, management and safety. The accessibility limitation in particular likely limits participation rates and rate of diversion.

There are generally no significant issues associated with local business collection sites in the Planning Area other than the limits on the types of materials they accept (e.g., often target single material) and thus do not represent a convenience when dealing with multiple material types. Because some businesses charge a fee for services, consumers may be reluctant to use the service, when legally HHW can be directed to an MSW landfill (Bluff Road). Because some local businesses also offer single material type special collection events (e.g., computers and electronics) they can also have issues of limited accessibility.

The option of constructing a permanent and fixed-facility for the Planning Area, for the receiving, handling and management of HHW and CESQG waste would likely result in several program advantages. These include:

- Increased diversion of hazardous and toxic materials from the landfill, including increased number/types of materials that could be managed.
- Increased convenience and accessibility to residents and businesses, which would likely increase program participation rates and the quantity of material collected.
- Increased opportunities for the safe and legal management (characterization/assessment, handling and disposal) of hazardous materials and waste.
- Increased opportunity for toxics reduction education and community behavior modification.
- Decreased (mobile) event costs, due to decrease mobilization, management, safety, and execution costs.
- Decreased need for volunteers (technical and non-technical), and associated risk, safety and management issues.
- Ability to maximize local reuse of good products to avoid shipping and disposal costs. This assumes such a facility would include a repurpose/swap shop.
- Ability to store large size shipments for most or all waste, thus creating more efficient and cost-effective shipping.

Beyond these advantages, a permanent and fixed-facility could have some short- and long-term disadvantages, including the following:

- Cost of facility design, construction and operation. A further evaluation of funding options would be necessary to establish cost implications to the Planning Area residents and businesses.
- Costs of additional staff to operate the facility. This would need to be further evaluated based on levels of service, hours of operation and materials accepted.
- Potential decrease or more limited opportunities for corporate partnerships.
- Decreased or limited opportunities for the use of volunteers.

There are not many notable disadvantages to a permanent and fixed facility to handle CESQG waste.

Consistent with the guiding evaluation criteria developed for use in the Solid Waste Plan 2040, the HHW and toxics reduction options have been further evaluated based on the considerations shown in Table 2. It is important to note that to best serve the City and Lancaster County a combination of fixed-facility(s) with limited mobile (and home-based community) collection events and local business collection sites would likely maximize the diversion of hazardous materials from disposal, community participation and program effectiveness.

Relationship to Guiding Principles and Goals

The current toxics reduction program of HHW/CESQG collection events, private businesses, City facilities, and education outreach provides a level of public/private partnership and opportunities for engaging the community in reducing waste and waste toxicity. As it relates to the Guiding Principles and Goals of the Solid Waste Plan 2040, (household and CESQG) hazardous waste management is directly applicable, as further noted below.

- **Emphasize the waste management hierarchy:** The toxics reduction programs (HHW, CESQG) are directly related to the waste management hierarchy in that they place maximum emphasis on options to reduce, reuse/repurpose, recycling, and recover to avoid and prevent the need to generate and manage a more toxic waste stream. A permanent HHW/CESQG hazardous waste facility (alone or in conjunction with existing periodic/ mobile collection events and local business collection site) provides the greatest opportunity to increase reuse (materials exchange), recycling, and recovery.
- **Encourage public/private partnerships:** The current toxics reduction program involves public and private stakeholders in complementary programs. A permanent facility would complement the current private business run recycling/take-back programs and could provide additional service to small business/CESQGs.
- **Ensure system capacity:** Current periodic/mobile collection events are heavily utilized, but may fall short of providing the required accessibility for all residents of the Planning Area. A permanent facility (alone or in conjunction with existing periodic/ mobile collection events and local business collection site) would significantly increase accessibility, and diversion and reuse opportunities to manage the hazardous waste generated by households and small businesses/CESQGs in the Planning Area; it would also provide needed capacity to sort, store and manage material more efficiently.
- **Engage the community:** an expanded toxics reduction program could help further involve the public and change behaviors relative to safe, sound, environmentally responsible solid waste management practices and increase emphasis on conservation, source reduction, reuse and recycling alternatives.

Table 2 – Options Evaluation

Evaluation Criteria	Periodic/Mobile Collection Events	Local Business Collection Sites	Permanent Facility
Waste Reduction/ Diversion	<p>Historic collection events have been effective; participation and quantities collected limited by frequency, location and nature of events. As noted above, quantities of HHW going to disposal with the MSW waste stream may be significantly greater than amount currently diverted by periodic mobile collection events.</p> <p>50 percent of the material currently collected is diverted; 50 percent is sent for disposal; these ratios are affected by the types of materials accepted and limited ability to repurpose or store materials that could be reused.</p>	<p>Are considered effective but focus on single materials and thus require a collective network to address all targeted materials.</p> <p>The quantities diverted are not known for the Planning Area.</p>	<p>Provides greatest potential for capturing and diverting HHW.</p> <p>Could offer an expanded menu of materials and could potentially be consolidated with materials from City facilities and/or CESQGs.</p> <p>Inclusion of a materials exchange/repurpose/reuse center will further increase diversion and community engagement in source reduction practices.</p>
Technical Requirements	<p>Diversion potential limited by number and nature of multiple single day events.</p> <p>LLCHD staff effectively manages the requirements of such events. Requires significant personnel time, challenging contractual issues, and often relies heavily on volunteers.</p> <p>Flexibility to increase or decrease events based on available funding.</p> <p>Continuing mobile collection events in</p>	<p>As a standalone option it may not include all desired materials. In conjunction with other systems/facilities provides for a comprehensive program and allows for diversion of potentially large volumes of a specific material.</p> <p>Reduces cost to government and consumers for proper management of specific materials.</p>	<p>Provides the greatest capacity and potential for increased materials diversion, community participation and material reuse (Accessibility).</p> <p>Greater potential for worker safety and safe working conditions (Management and Safety).</p> <p>Can provide year-round access and short-term scheduling, based on need (accessible and</p>

Evaluation Criteria	Periodic/Mobile Collection Events	Local Business Collection Sites	Permanent Facility
	<p>the Planning Area (possibly in conjunction with a permanent facility) will provide convenience, accessibility and participation.</p>	<p>May not require the same level of training as other HHW because of limited product nature.</p> <p>Easy to continuously promote and promotional effort may provide secondary benefits to local business.</p>	<p>available when resident wants to clean out or get rid of HHW).</p> <p>Greatest control of site security.</p> <p>Flexibility in handling materials of unknown composition.</p>
Environmental Impact	<p>Helps reduce toxicity of the waste stream disposed, prevents inappropriate releases to other management systems and the environment.</p> <p>Residents may continue to dispose HHW with refuse due to limited program availability.</p> <p>Spill prevention and site preparedness required in conjunction with each event.</p>	<p>Helps reduce toxicity of the waste stream disposed, prevents inappropriate releases to other management systems and the environment.</p> <p>As a standalone option it may not include all desired materials. A comprehensive network is required to address the range of HHW materials requiring management.</p> <p>Due to the standalone nature it may not adequately provide for materials that are more hazardous to business employees (e.g., may not accept ignitable, corrosive, toxic (by exposure) chemically reactive or toxic ingredients).</p>	<p>Provides greatest opportunity to reduce toxicity of the waste stream disposed, prevents inappropriate releases to other management systems and the environment.</p> <p>Can provide opportunities to reuse and recycle of hazardous household products, conserves resources and can reduce the need for generating new hazardous products.</p> <p>Permanent facility design can best reduce/minimize environmental risks from potential spills.</p>

Evaluation Criteria	Periodic/Mobile Collection Events	Local Business Collection Sites	Permanent Facility
Economics	<p>Annual cost of collection events depending upon number of events, quantity and types of materials received.</p> <p>Requires a funding commitment; is not considered a net revenue generator; some revenue options are available from users.</p> <p>Often relies heavily on volunteers (8 to 20 per event) to reduce costs.</p> <p>Number of collections can be used to control costs; but, this also limits program effectiveness.</p>	<p>Generally all costs paid by business; some materials may involve user fees.</p> <p>Because the materials handled may be limited it may not fully shift cost away from waste generators and government. See the paper on Product Stewardship for additional information on extended producer responsibility options as a funding mechanism for certain materials.</p>	<p>Requires funding to cover land purchase, design, and construction costs.</p> <p>May not have access to all of the same corporate funding as periodic/special collection events.</p> <p>May have greater access to sources of revenue from CESQG fees and if used as a regional facility.</p> <p>Hours of operations can be used to control labor costs.</p>
Implementation Viability	<p>Not a new technology and has been proven viable.</p> <p>Requires promotion and education to maximize participation on select days. However, this promotional effort serves to keep alternative for safe and environmentally appropriate management of household hazardous waste in full public view.</p> <p>Relies upon corporate/community partners for event site</p> <p>Require significant effort and logistical considerations for each one-day event.</p>	<p>Not a new technology and has been proven viable.</p> <p>Extensive network currently in place for select materials. Extended Producer Responsibility laws could increase number of sites and types of materials handled at no added cost to government.</p> <p>Does not rely upon government funding to implement or sustain program.</p> <p>Voluntary nature does not ensure longevity or consistency</p>	<p>Not a new technology and has been proven viable.</p> <p>Suitable and permitable site required.</p> <p>May be co-located near existing City solid waste facilities that serve households.</p> <p>Once established it will require a long-term commitment to funding; community will expect minimum level of services to be maintained.</p>

Evaluation Criteria	Periodic/Mobile Collection Events	Local Business Collection Sites	Permanent Facility
	Can be modified from year to year based on available funding.	of approach.	

- **Embrace sustainable principles:** Proper management of hazardous materials and waste is based on sustainable principles in emphasizing that waste is not inevitable and in considering environmental, economic, and social dimensions in managing and using resources.

Summary

Federal and state laws allow for disposal of HHW and CESQG hazardous waste in a municipal waste landfill. Lincoln and Lancaster County have implemented toxics reduction programs to reduce the amount of hazardous waste going into the City's landfill and to protect public health and the environment. Participation in any toxics reduction program and related HHW/CESQG collection efforts can be significantly influenced by convenience and level of educational outreach. Improperly managed HHW/CESQG hazardous wastes can pose a threat to human health and the environment. Removal of hazardous materials/waste from the solid waste stream, along with proper management, can mitigate these risks and reduce the toxicity of the waste stream.

Many communities across the United States, including Lincoln and Lancaster County provide programs to allow members of their community to safely manage hazardous materials and waste. The cost of these City-County toxics reduction programs is currently paid for from the Occupation Tax on refuse haulers and from State grants. The LLCHD's toxics reduction programs have received significant value from volunteer time and participation by corporate sponsors. Local business collection sites also reduce the cost to citizens and government. The CESQG program receives funds from waste generators to pay for material disposal.

There are many types of program options available and the collection and diversion options are essentially consistent with the Solid Waste Plan 2040 guiding principles and the most preferred options under the waste management hierarchy. Of the program options available, a permanent HHW/CESQG hazardous materials/waste facility (alone or in conjunction with existing periodic/ mobile collection events and local business collection site) appears to provide the greatest benefit in terms of increasing reuse, diversion, and minimizing disposal, by providing year round accessibility (increasing participation rates), increasing material management options, lowering risk associated with improper management of hazardous materials and waste, improving safety to users and staff, greater efficiencies of operation, and allowing integration with other existing (and future) programs.

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APPENDIX

Toxics Reduction/Hazardous Materials Management for Households and Small Businesses

- Existing Program Analysis

Target: Lincoln-Lancaster County Households (2010 Census – 108,755 Households)

Description: The Health Department coordinates 5 to 10 hazardous waste collections for households each year. Residents bring chemicals, such as pesticides, solvents, caustic cleaners and mercury, which pose a danger in the home and to our environment if not properly managed. Educating the public on choosing least toxic alternatives and proper disposal, and holding several collections each year reduces the amount of hazardous waste disposed in our landfill and is one of the best management practices cited in the city's NPDES MS4 (stormwater) permit. Two appointment only collections were held in FY10 and FY11 to assess the feasibility of the N 48th St. landfill site as an option for a permanent facility.

Partnerships & Efficiencies: Mobile HHW collections are efficient and maximize public access to dispose of hazardous waste. Business partners provide sites for collections along with trained and non-technical volunteers (upwards of 8 – 15 volunteers/event). The long term impact of ongoing public education/behavior change strategies is less hazardous waste being generated and proper reuse, recycling and disposal of hazardous waste. Only hazardous waste is accepted, and wastes which can be reused/recycled by local businesses, such as oil, lead acid batteries, button batteries, and antifreeze are not accepted at collections.

Waste Management Goal: Protect human health and the environment by: reducing exposures to hazardous materials; assuring proper management and disposal of special wastes; preventing hazardous waste from being illegally disposed of in the Bluff Road Landfill; reduce litter; and preventing illness and disease caused by improper waste management.

Indicator: Divert at least 100,000 pounds (50 tons) of toxic material from City of Lincoln and Lancaster County households. Make available toxics reduction education to all area residents.

Methods & Strategies:

- 6 to 8 HHW collections are held in various areas each year
- Each collection is promoted via signs and media releases
- Community education (behavior change) efforts focus on choosing least toxic alternatives and guiding the public on using up, reusing or recycling waste (media, Internet, brochures)

Staffing & Costs: In FY11, this program required 2.7 FTE and direct program costs were \$387,303 and total costs were \$490,954(2).

Funding/Source: Waste Hauler Occupation Tax; Grants in Aid; Supplemental Environmental Protection (SEP) Funds

Target: Lincoln-Lancaster County Conditionally-Exempt Small Quantity Generators (Small Businesses)

Description: The Health Department coordinates two small business hazardous waste collections each year to provide safe and economical disposal for small businesses and agencies as well as educational program, technical assistance and site visits. The collections reduce the risk of hazardous materials spills and fires, which can impact neighborhoods and our environment, and eliminate potential occupational exposures. Each business that participates saves from \$600 to \$1200 in mobilization fees, labor charges and transportation costs by participating. These collections have saved participants over \$150,000 over the past 6 years. The disposal cost is paid for by each business, but at significant savings since it is charged at the City's contracted cost. These efforts reduce the amount of hazardous waste disposed in our landfill and is one of the best management practices cited in the city's NPDES MS4 (stormwater) permit.

Partnerships & Efficiencies: Coordinating these collections saves small businesses thousands of dollars in disposal costs, reduces their liability, and decreases the likelihood that they will be in violation of Federal RCRA Hazardous Waste laws. Basically we are leveraging a very small amount of grant money into major costs savings for our business community. Both waste/risk reduction audits and the hazardous waste collections help to assure that business hazardous waste is not disposed of in the Bluff Road Landfill (a permit requirement) or illegally disposed on land, into water, into wastewater, or into our stormwater drainage system. This protects the city from liability and fines.

Waste Management Goal: Protect human health and the environment by: reducing exposures to hazardous materials; assuring proper management and disposal of special wastes; preventing hazardous waste from being illegally disposed of in the Bluff Road Landfill; and preventing illness and disease caused by improper waste management.

Indicator: At least 90% of small businesses that want to participate in hazardous materials collection events have access. Serve at least 30 small businesses and agencies each year. Divert at least 15,000 pounds (7.5 tons) annually of toxic material from small businesses/agencies.

Methods & Strategies:

- 2 CESQG collections are held each year (One at the N. 48th Street Transfer Station and the other at Woods Park in central Lincoln)
- Postcards detailing the event and required procedures are sent out to area businesses
- Staff provide technical assistance to identify toxic reduction options which include proper management and disposal of hazardous wastes.

Staffing & Costs: In FY11, the special waste program is coordinated by 1.0 FTE, a small portion of which involves planning and coordination of two small business (CESQG) waste collection events per year. CESQG event costs are minimal and have not been broken out of the total program costs. The hazardous waste contractor mobilization fee is funded by the waste hauler occupation tax and grants-in-aid. Participating small businesses cover all disposal costs for waste brought to the CESQG collection events.

Funding/Source: Waste Hauler Occupation Tax, Grants in Aid, Small Businesses (pay for own disposal costs)

Yard Waste

Overview

Nebraska Department of Environmental Quality (NDEQ) Title 132 regulations defines “yard waste” as

“grass and leaves. For the purposes of composting, yard waste shall mean grass and leaves in combination with chipped trees and branches and other organic material collected as the result of the care of ornamental plants, lawns, shrubbery, vines and gardens.”

The Lincoln Municipal Code (LMC) Section 8.32.010 defines “lawn waste” as “grass cuttings or clippings and leaves.” Future papers, as part of the Solid Waste Plan 2040 will discuss other types of organic waste management, some of which may have synergies with yard waste composting. For purposes of this paper the term yard waste will be used, unless specific referencing those aspects related to the LMC.

Nebraska Revised Statutes Section 13-2039 (part of Nebraska’s Integrated Solid Waste Management Act) bans yard waste from landfills, but provides the following exceptions:

- “(a) A landfill may accept yard waste without condition from December 1 through March 31 of each year.
- (b) A landfill may accept yard waste year-round if such yard waste:
 - (i) Will be used for the production and recovery of methane gas for use as fuel (A) with the approval of the department and (B) at a landfill operating as a solid waste management facility with a permit issued pursuant to the department's rules and regulations; or
 - (ii) Has been separated at its source from other solid waste and will be used for the purpose of soil conditioning or composting.”

Currently the City’s Bluff Road Landfill does not have NDEQ approval to accept yard waste on a year-round basis. The City would be eligible to apply for such approval when the landfill gas power generation facilities, currently under design/construction by Lincoln Electric System, are complete in 2013.

Seasonal yard waste bans have created the need for separate collection and management systems for those individuals that choose to collect and “bag” their yard waste for off-site management.

Current Programs

As part of lawn maintenance residents and business decide how to manage their yard waste. The most common options utilized in the Planning Area currently include:

1. Leaving it on the lawn (e.g., mulching mower);
2. Collecting it and reusing it for compost or mulch on their property;
3. Collecting it and transporting it (self haul) to local composting or receiving facilities; and,
4. Collecting it and contracting for hauling by lawn services or professional waste haulers to a compost site or disposal facility.

From an overall source reduction strategy options 1 and 2 are the most preferred.

Leaving it lay on the turf has many agronomic advantages. However, letting it lay may not always be an option for areas with large volumes of leaves or when regular mowing is not performed. Backyard or onsite composting can be conducted by residents and certain businesses on their own property. By composting these materials onsite, Planning Area homeowners and businesses can significantly reduce the amount of yard waste that needs to be transported and manage (composted or disposed) off-site. This practice can also save them money by avoiding hauling and management costs.

In response to Nebraska's seasonal ban, the City constructed a large scale (13 acre) commercial composting facility adjacent to the Bluff Road Landfill, and provided separate material receiving and handling facilities at the City's N. 48th Street Transfer Station. Commercial refuse haulers and commercial lawn maintenance companies hauling yard wastes can deliver clean yard waste to the composting facility. Brush and tree waste, which is free of soil and other debris, may also be taken to this facility. Households and smaller yard waste haulers must deliver material to the N. 48th Street Transfer Station site. Yard waste and other compostable waste delivered to the North 48th Street site are taken to the Bluff Road site for further processing and composting. Finished compost is available to the general public through area landscapers, garden centers and contractors and is marketed as LinGro Compost. The City grinds and chips wood at both North 48th Street and Bluff Road facilities and the material is currently used in the compost and landfill operations. The yard waste management and composting program is funded by user drop-off (tipping) fees, the Occupation Tax, grant funds from NDEQ and from sales of LinGro Compost.

Independent waste haulers generally provide a menu of services to residents and businesses related to yard waste. Optional yard waste collection services are available through various waste haulers or recycling contractors which includes yard waste (grass and leaves) collection (typically April 1st until December 1st) and fall only leaf collection (typically October and November). While LMC requires waste haulers operating within the three mile corporate limits of the City to have a license to collect, haul and convey garbage, there is an exemption to the permitting requirements for firms collecting hauling and conveying lawn waste. In the Planning Area private haulers will collect and transport the grass and leaves to composting facilities for a fee; once collected they can also haul them to certain landfills outside of Lancaster County for disposal.

The City promotes waste reduction, diversion and composting of yard waste through the Public Works and its Recycling and Solid Waste Operation website <http://lincoln.ne.gov/city/pworks/waste/sldwaste/recycle/programs/yardwaste/> as well as educational information provided in the *Lincoln-Lancaster County's Official 2012 Waste Reduction & Recycling Guide*, which is also available through the Solid Waste Operations website. Additionally the City provides several "Backyard Composting Workshops" annually, free of charge to residents and promotes thoughtful use of lawn and garden chemicals through its educational programs.

Generation and Diversion

Approximately eight percent of the total MSW generation in the Planning Area is estimated to be yard waste. Of the total yard waste collected for management 67 percent is currently estimated to be managed by composting (through the City's composting site). The NDEQ's 2008 Nebraska Waste Characterization Study included a waste sort and characterization at the Bluff Road Landfill. This study estimated that approximately three percent, by weight, of the material disposed of at the Bluff Road Landfill was yard waste; based on fiscal year 2011 disposal rates this is equivalent to slightly more than 9,700 tons per year. The City's composting operations processed an average of 14,800 tons of yard waste and 4,600 tons of wood waste per year over

the past five years. The facility produces approximately 4,600 tons of wood chips per year and over the last 5 fiscal years has distributed an average of about 8,900 cubic yards of finished compost and wood chips. The villages of Bennet, Davey, Firth, Hickman, and Panama, operate yard waste and brush collection areas while Roca and Waverly operate brush only collection areas for their residents.

City Solid Waste Operations estimates that over the life of their composting and wood waste grinding programs (FY92-93 through FY10-11) approximately 256,000 tons of yard waste has been composted and approximately 111,000 tons of wood waste has been ground into wood chips. This has reduced the amount of landfill space consumed by approximately 540,000 cubic yards and represents an extension of the life of the Bluff Road Landfill by 1.3 years.

Program (Facility/System) Options

A key decision as it relates to the Solid Waste Plan 2040 is whether or not the City will exclude yard waste from the Bluff Road Landfill, and if so by what means and to what extent. Currently yard waste is only banned from the landfill from April 1st until December 1st.

Basic program options include:

1. Allow year round disposal in the Bluff Road Landfill.
2. Continue current seasonal bans, coupled with existing or enhanced City composting facility.
3. Ban all yard waste from the landfill year round.

None of these options preclude source reduction programs which discourage generation and promote leaving it on the lawn and/or reuse on the site where it is generated. The planning process also provides the opportunity to review the definition of “lawn waste” (LMC Section 8.32.010) and whether it should be expanded to include other organic material (e.g., garden and flower bed waste).

One argued benefit of accepting it at the landfill year round (Option 1) is that it is readily degradable and can be used to generate landfill gas, which can be used to produce saleable energy. Currently three landfills in Nebraska (Douglas County, Butler County, and South Sioux City) accept yard waste year round; these all have landfill gas recovery systems and sell landfill gas to produce energy. The obvious arguments against this approach are the resulting air emissions, a portion of which will vent to the atmosphere and the volume it will consume in the landfill. If all of the yard waste currently sent to the City’s compost operations were redirected to the landfill it would shorten the overall life of the landfill by approximately one year.

Option 2 is consider the status quo, but may or may not be enhanced by increase source reduction efforts. One additional enhancement that will be addressed in a future evaluation is organic waste composting; it may be possible to include other materials with yard waste in an enhanced composting operation. One observed short-coming of the current approach is that some households save their yard waste until December and then include these materials with their household garbage, thus avoiding paying for separate yard waste collection services and circumventing the intent of the state’s ban (minimizing landfilling). The number of households doing this is not known.

Another key decision will be the level of City’s continued involvement in managing this banned waste type. For purpose of this analysis, it was assumed that there would be no change to the current City policy stated in the LPlan 2040 of “public ownership, operation and financing of disposal and selected integrated solid waste management services will continue during the planning period.”

Option 3 effectively forces any collected yard waste to a composting facility (City or private) or to disposal site outside Lancaster County. Not everyone is willing to practice source reduction and stop collecting yard waste, and it is important to recognize that not all residents or businesses have the desire, space, or need to utilize or compost collected yard waste on their property. As such, some level of continued off-site management is anticipated in the future, even if it is banned from disposal in Lancaster County.

From an overall program perspective, if the City's goal is to emphasize source reduction and minimize landfill disposal the following options might be considered:

- Ban all yard waste from the landfill year round.
- Support programs to leave it on the lawn and reuse it on the site where it is generated.
- Re-evaluate City policy of providing collection and management alternatives for yard waste at remote locations.

Composting of yard waste off-site is not a source reduction option but is considered a form of recycling. In general source reduction strategies for yard waste are focused on reduction at the source (e.g., "Don't Bag It", "Let It Lie", backyard composting and mulch), but generally recognize the need for remote composting facilities (recycling) as non-disposal management options.

Options Evaluation

Consistent with the guiding evaluation criteria developed for use in the Solid Waste Plan 2040, yard waste programs have been evaluated based on the following considerations of: waste reduction/diversion; technical requirements; environmental impacts; economic impacts; and, implementation viability. These evaluations are presented in Table 2.

Relationship to Guiding Principles and Goals

As it relates to the Guiding Principles and Goals of the Solid Waste Plan 2040, promoting expanding yard waste management programs would be applicable as further noted below:

- **Emphasize the waste management hierarchy:** management of yard wastes is directly related to the waste management hierarchy in that it places maximum emphasis on reduce, reuse, and recycle (composting) to avoid or minimize waste collection and disposal in the City's landfill.
- **Encourage public/private partnerships:** current curbside collection of yard waste is voluntary, subscription based through private haulers and essentially places the direct financial burden on the generator to pay for management of yard waste transported off-site. Current practice relies on public (City) ownership, operation and financing of commercial composting operations, wood grinding, and the North 48th Street drop-off site as part of its integrated solid waste management services.
- **Ensure system capacity:** increased source reduction programs for yard wastes could help delay or eliminate the need for additional infrastructure to manage yard waste throughout the planning period. If increased yard waste collection occurs the capacity to process such material will likely need to increase. Allowing year round disposal in the landfill will reduce the life of the Bluff Road Landfill by approximately one year but may increase the energy sales; this would require further evaluation.
- **Engage the community:** Increased source reduction and changes in management practices (e.g., Don't Bag It, Let It Lie or onsite composting) will require an engaged community because it ultimately seeks to change the current management/disposal

Table 2 – Options Evaluation

Evaluation Criteria	Allow Year Round Disposal in Bluff Road Landfill	Continue Current Seasonal Bans, Coupled with Existing or Enhanced City Composting	Ban All Yard Waste from the Landfill Year Round
Waste Reduction/ Diversion	<p>This is not a source reduction method, but would be considered an energy recovery method; such a method would count against a numeric diversion goal.</p> <p>Yard waste is readily degradable and can be used to generate landfill gas, which can be used to produce energy. Energy market is established but energy market demand would need to be further evaluated.</p> <p>The economic incentives for source reduction that currently exist as a result of a separate collection fees would be diminished or eliminated.</p>	<p>This is not a source reduction method. Programs that manage yard waste off-site (not in a landfill) are forms of recycling.</p> <p>Options for reducing the quantities managed through collection and central composting facility would be consistent and compatible with those discussed in separate technical papers on source reduction and zero waste.</p>	<p>This could provide the greatest incentive to source reduction.</p> <p>3 percent of the municipal solid waste currently received at the Bluff Road Landfill is estimated to be yard waste; such a ban should reduce this quantity.</p> <p>Programs that manage yard waste off-site (not in a landfill) are forms of recycling.</p> <p>This could also result in greater quantities of yard waste being composted locally as well as exported to out of County landfill(s). Current LMC regulations do not regulate the collection of yard waste nor do they restrict export.</p>

Evaluation Criteria	Allow Year Round Disposal in Bluff Road Landfill	Continue Current Seasonal Bans, Coupled with Existing or Enhanced City Composting	Ban All Yard Waste from the Landfill Year Round
Technical Requirements	<p>If all of the yard waste currently sent to the City's compost operations were redirected to the Bluff Road Landfill it would shorten the overall life of the landfill by approximately one year.</p> <p>The Bluff Road Landfill accepted yard waste in the early 1990s, prior to the state ban, and would be capable of managing such material.</p>	<p>The existing commercial composting area adjacent to the Bluff Road Landfill is currently close to capacity; expanded City composting operations is anticipated to require modifying the current management system (e.g., pre-grinding incoming materials), expansion of the composting area, or alternate areas for management in the County.</p> <p>The current and optional programs for yard waste are considered compatible with other solid waste management programs (public and private).</p> <p>The current commercial composting program, supported by educational efforts, is considered highly reliable, effective, flexible and compatible with other City operations.</p> <p>Yard waste compost is sold as a recovered material, but currently supply exceeds private sector demands; the remaining compost is utilized within City operations.</p>	<p>By revising the LMC definition of "lawn waste" and instituting a ban, the quantities received at the Bluff Road landfill would be reduced; the life of the landfill would be extended, but by less than 1 year.</p> <p>A certain amount of risk and uncertainty would exist if a total ban on landfilling were implemented (e.g., improper management, illegal dumping, open burning, public opposition).</p> <p>Education is a critical aspect of backyard or onsite composting and source reduction efforts.</p> <p>Yard waste compost is sold as a recovered material, but currently supply exceeds private sector demands; the remaining compost is utilized within City operations.</p>

Evaluation Criteria	Allow Year Round Disposal in Bluff Road Landfill	Continue Current Seasonal Bans, Coupled with Existing or Enhanced City Composting	Ban All Yard Waste from the Landfill Year Round
Environmental Impacts	<p>Anaerobic digestion in a landfill will result in landfill gas generation, a portion of which will vent to the atmosphere as greenhouse gas (methane) emissions.</p> <p>If yard waste is co-collected with garbage the number of vehicles driving through a neighborhood may be reduced.</p>	<p>Yard waste and resulting compost products are not considered a hazardous or toxic waste and do not require disposal in a sanitary landfill.</p> <p>The addition of compost to the clay soils in Lincoln and Lancaster County has the benefit of making soils healthier by adding organic matter and decreasing the soils bulk density, thus allowing for greater water retention and infiltration and a reduction in fertilizer requirements. This reduces the required use of water and the amount of water that runs off lawns into storm sewers.</p> <p>Health and safety issues associated with yard waste management are considered minimal but increase with increased degrees of handling.</p>	<p>Programs to leave yard waste on the lawn are viewed as having the lowest environmental impact because they benefit the lawn and do not require the expenditure of resources (material and energy) to collect and manage, and as such should have the lowest levels of potential air emissions.</p> <p>It cannot be stated for certain that a ban at the City's landfill will result in all yard waste being diverted from disposal.</p> <p>Uncontrolled anaerobic composting operations have the greatest potential to generate greenhouse gases as well as odors; anaerobic conditions can exist in improperly managed composting operations.</p>

Evaluation Criteria	Allow Year Round Disposal in Bluff Road Landfill	Continue Current Seasonal Bans, Coupled with Existing or Enhanced City Composting	Ban All Yard Waste from the Landfill Year Round
<p>Economic Impacts</p>	<p>Capturing greenhouse gas emissions yard waste may pose challenges and add cost to operations.</p> <p>Residents may not need to pay a separate collection fee for yard waste collection. However, if generators set out large volumes of yard waste, waste haulers may require added fees.</p> <p>Economic impacts to waste haulers may require further evaluation of the costs and benefits resulting from changes in current services provided.</p>	<p>Presently residents who choose to have their yard waste managed off-site pay, directly or indirectly, to have it collected, transported and managed at remote locations; currently those who do not collect it or who choose to manage it on their own property do not experience any significant costs.</p> <p>The expansion of the City's existing commercial composting operation will require capital investments for expanded management areas to effectively manage larger quantities of yard waste.</p> <p>At present, yard waste management is not viewed as a tool for potential economic development.</p> <p>The economic implication of reducing or increasing the quantities managed at the City's commercial composting site would require further evaluation; increases may result in a certain economy of scale benefit, but again would require a capital expenditure to increase handling capacity.</p>	<p>Assuming such banned yard waste would go to the City's composting operation, the expansion of the City's existing commercial composting operation will require capital investments for expanded management areas to effectively manage larger quantities of yard waste.</p> <p>Presently residents who choose to have their yard waste managed off-site pay, directly or indirectly, to have it collected, transported and managed at remote locations.</p>

Evaluation Criteria	Allow Year Round Disposal in Bluff Road Landfill	Continue Current Seasonal Bans, Coupled with Existing or Enhanced City Composting	Ban All Yard Waste from the Landfill Year Round
Implementation Viability	<p>Allowing year round disposal would require modifications to the landfill's permit and possibly an expansion of the current landfill gas recovery system (this system will ultimately be expanded as the landfill grows in size).</p> <p>The social and political acceptability of allowing year round disposal would require further assessment.</p>	<p>The City is viewed as having adequate land adjacent to its existing operation to allow expansion; the implications of such expansion on future use of such land would require further evaluation and may be addressed in considering options for future landfill needs.</p> <p>If the quantity of organic material accepted at the current City facility increase significantly additional NDEQ permitting may be required.</p>	<p>Changes to current programs, such as bans would require changes to the LMC.</p> <p>The social and political acceptability of bans would require further assessment.</p> <p>While the City has currently adopted a policy of providing management options for waste banned from the landfill and managing the post-collection composting operations, significant changes to the current program may change the role of the City or other parties.</p>

ethos by including lifestyle and societal changes. Public education to engage the community will be important to sustaining existing programs and to increase source reduction program participation.

- **Embrace sustainable principles:** Reduction in the quantity of yard waste generated (source reduction) and reducing the requirement for off-site management are consistent with sustainability principles in emphasizing minimizing safety, environmental and social impacts and maximizing economic benefits. Recycling/composting and energy recovery would be alternatives of a lesser priority.

Summary

Nebraska statutes ban yard waste from landfills from April 1 until December 1st of each year, but provide certain exceptions that would allow the City to accept it in their landfill on a year round basis. Seasonal yard waste bans have created the need for separate collection and management systems for those individuals that choose to collect and “bag” their yard waste for off-site management. From an overall source reduction strategy leaving it on the lawn (e.g., mulching mower) and collecting it and reusing it for compost or mulch on the site where it was generated are the most preferred options.

Leaving it lay on the turf has many agronomic advantages. However, letting it lay may not always be an option for areas with large volumes of leaves or when regular mowing is not performed. Composting of yard waste off-site is not a source reduction option but is considered a form of recycling. In response to Nebraska's seasonal ban, the City constructed a large scale (13 acre) commercial composting facility adjacent to the Bluff Road Landfill, and provided separate material receiving and handling facilities at the City's N. 48th Street Transfer Station site.

A key decision as it relates to the Solid Waste Plan 2040 is whether or not the City will exclude yard waste from the Bluff Road Landfill, and if so by what means and to what extent. From an overall program perspective, if the City's goal is to emphasize source reduction and minimize landfill disposal the following options might be considered:

- Ban all yard waste from their landfill year round.
- Support programs to leave it on the lawn and reuse it on the site where it is generated.
- Re-evaluate City policy of providing collection and management alternatives for yard waste at remote locations.

Universal, Special and Unique Wastes

Overview

Universal, Special and Unique Wastes are those materials that require special handling and care for safe reuse, recycling, collection, treatment, and disposal. Universal Wastes are hazardous wastes that are generated by small and large businesses and are regulated under the Nebraska Department of Environmental Quality (NDEQ) Title 128 – Nebraska Hazardous Waste Regulations. Title 128 provides specific management standards intended to decrease the regulatory burden and increase reuse and recycling of these hazardous wastes. Universal Wastes from households are not subject to the Universal Waste regulations and can legally be disposed of at a municipal waste landfill, such as the City's Bluff Road Landfill. However, as discussed under the paper on household hazardous waste (HHW) these wastes can generally be more safely managed in a source reduction, recycling or diversion program.

Universal Waste regulations ease the regulatory requirements for hazardous waste and provide businesses alternate management standards. The regulations streamline the requirements related to notification, labeling, marking, prohibitions, accumulation time limits, employee training, response to releases, off-site shipments, tracking, and transportation to facilitate recovery and recycling. The following are defined by Nebraska Title 128 as Universal Wastes:

- Batteries
- Pesticides
- Mercury-containing items
- Spent lamps (fluorescent, high-pressure sodium, mercury vapor, metal halide)
- Electronic items

The first four items listed above are the same as the federal list; Nebraska has added electronic items to the list.

Special Waste is defined by NDEQ in Title 132 – Integrated Solid Waste Management Regulations and also by Lincoln Municipal Code (LMC) 8.32 – Solid Waste. LMC 8.32.080 defines six groups or categories of Special Waste, as listed below. A full list of what is included in each group is provided as an Appendix to this document.

Group I: Wastes That May Contain Free Liquids

Group II: Petroleum-based Wastes

Group III: Empty Containers

Group IV: Solvents, Absorbents, Filters, and Residues

Group V: Hazardous or Toxic Chemicals or Chemical Products

Group VI: Miscellaneous

Item (35) in the Group VI definition includes “Any other solid waste which requires special management to ensure protection of public health, safety, or the environment based upon the physical, chemical, or biological properties of the waste”. By virtue of this definition the LLCHD has the right to make a determination on whether a waste is a Special Waste. NDEQ's definition of Special Waste includes “solid waste, except waste which is regulated as a hazardous waste, which possesses physical, chemical, or biological characteristics that make it different from general municipal solid waste, or construction and demolition waste, and which requires special handling, treatment, or disposal methodologies in order to protect public health, safety, and the environment.” Universal and Special Waste do not generally include HHW; HHW is discussed in a separate technical paper.

The definitions of Unique Waste may vary by community. Unique Wastes typically refer to those that require special handling or those that may be more difficult to manage, reuse or recycle at a household or business level. Nebraska law (Nebr. Rev. Statutes Chapter 13, Section 13-2039 (part of Nebraska's Integrated Solid Waste Management Act)) bans certain materials from landfill disposal (e.g., tires, waste oils, lead acid batteries, appliances, and others). Tires and appliances are two examples of Unique Wastes.

For purposes of this paper the following materials are considered Unique Wastes:

- Tires
- Electronic Waste (e-waste)
- Scrap Metals and Appliances
- Household Medical Waste and Pharmaceutical Waste
- Paints (Latex and Oil)
- Difficult to Handle Materials

This is not an all-encompassing list but provides an example of the wide variety of materials that can be considered Unique Wastes. Examples of difficult to manage waste include tree root balls and large timbers, bulky items such as pieces of metal, furniture, mattresses, carpeting or disaster debris; they can also include wastes that do not readily compress (e.g., rigid pipe). Other difficult to manage and less bulky items that can be generated at a household level include items such as compressed gas cylinders, fire extinguishers, and ammunitions.

Current Programs

The City's Bluff Road Landfill is not licensed to accept hazardous waste; it is licensed, but not obligated, to accept Special Waste. Because Universal Wastes are hazardous wastes they are banned from disposal at the City's landfills.

Pursuant to LMC 8.32, the LLCHD administers a Special Waste permit program. Two of the key provisions of LMC Section 8.32.080 include the following:

- "Industrial, commercial, and home occupation generators of a special waste, in any quantity, must upon request by the Health Director, provide an inventory of wastes generated."
- "No industry, commercial operation, or home occupation shall dispose of any special wastes in quantities greater than that provided from time to time by resolution of the City Council... without first obtaining a written permit from the Health Director."

The LLCHD Special Waste program goals are to protect human health and the environment by ensuring that industrial and business waste is properly managed, prevent hazardous waste from being disposed of in the Bluff Road Landfill, and to provide technical assistance on pollution prevention opportunities, reuse, recycling and disposal options. These goals are accomplished through:

- (1) inventorying all businesses that may generates one of the 35 different "special" waste types;
- (2) reviewing submitted material safety data sheets (MSDS) and laboratory test data;
- (3) issuing permits with specific permit conditions;
- (4) hazardous waste identification and assisting with proper storage, handling, and disposal options;
- (5) conducting investigations and taking appropriate enforcement actions;

- (6) providing educational fact sheets; and,
- (7) providing on-site technical assistance in pollution prevention, waste reduction, and regulatory requirements.

A core part of LLCHD Special Waste program is providing education and technical assistance to businesses in understanding their regulatory requirements, finding alternative less toxic products, encouraging best management practices and providing information on reuse and recycling through product reuse for another business, via the Keep Nebraska Beautiful Material Exchange Program and WasteCap Nebraska.

The Special Waste Program:

- reduces illegal waste disposal on land, water, air, into wastewater and stormwater drainage system;
- protects the City from liability and fines;
- reduces risk to the public, refuse haulers, landfill staff and the environment through permit conditions; and,
- reduces the number of required NDEQ random inspections by landfill personnel, thus limiting staff exposure to various types of waste.

LLCHD staff also conducts risk reduction audits of businesses with extremely hazardous substances to:

- assure compliance with the regulations;
- encourage best management practices;
- identify risk reduction options; and,
- gather information to plan for emergency response spills or releases.

This program compliments the City's operations of the Bluff Road Landfill in providing both a Special Waste tracking and disposal approval process. When a Special Waste generator desires to use the Bluff Road Landfill their request is subject to several conditions including approval from both the LLCHD and the City's Public Works and Utilities Department. This program is unique within Nebraska and provides a very effective means of minimizing the quantity of potentially hazardous or toxic waste disposed in the Bluff Road Landfill. Again, the Bluff Road Landfill is not obligated to take Special Waste and as such is selective in the materials it receives. Additionally, the City, pursuant to state regulations and permit conditions, conducts random inspections of incoming loads of waste to further minimize the potential receipt of hazardous waste and other unauthorized materials. The following are examples of Special Waste accepted at the Bluff Road Landfill, subject to compliance with the LLCHD Special Waste permits program:

- Asbestos
- Treated wood,
- Treated infectious waste
- Certain petroleum based wastes

The following are current programs (not a complete list) that address source reduction, reuse, recycling and proper disposal of materials that may be generated at a household level with characteristics of Universal, Special and Unique Waste:

- Diversion of the following materials can be accomplished through several voluntary retail and facility take-back locations. A list of such these facilities is provided on pages 6 and 7 of the *Lincoln-Lancaster County's Official 2012 Waste Reduction & Recycling Guide*. Fees and restrictions may apply.
 - Appliances
 - Batteries (lead-acid, rechargeable, button)
 - Electronics (limited to computer equipment, televisions, and toner cartridges)
 - Compact fluorescent lights (CFLs)
 - Fire extinguishers
 - Tires
 - Propane tanks
- City facilities, Bluff Road Landfill and North 48th Street Transfer Station, accept the following items. Fees may apply.
 - Appliances
 - Tires
 - Lead-acid automobile batteries (at North 48th Street site only)
 - Used Motor Oil (at North 48th Street site only)
- LLCHD coordinates HHW and CESQG hazardous waste collection events. The HHW events do not accept lead acid batteries and electronics waste, but do accept the following universal-type wastes from households:
 - Pesticides
 - CFLs and fluorescent light tubes
 - Mercury thermometers and thermostats

These events also accept a wide range of other household hazardous wastes. For a list of items that are and are not accepted at these events see page 11 of the *Lincoln-Lancaster County's Official 2012 Waste Reduction & Recycling Guide*.

- LLCHD is currently working with the Nebraska MEDS Coalition to implement a program to provide safe and legal disposal alternative for unwanted and expired consumer medications.
- Non-Profit organizations provide organized diversion programs for certain building materials and other reusable items, including but not limited to the following:
 - EcoStores Nebraska for construction, demolition and remodeling materials, supplies and re-usable paints (latex and oil)
 - Nebraska Materials Exchange (Keep Nebraska Beautiful) for schools and businesses
 - Charitable organizations, thrift and consignment stores also take reusable appliances, working electronics, and other merchandise.
- Educational initiatives provided locally by the City, LLCHD, and private organizations (e.g., WasteCap Nebraska) inform residential, business, institutional, and industrial waste generators of items that are potentially hazardous and how to avoid, reduce, and properly manage and dispose of such materials.

Generation and Diversion

Generation and diversion quantities of universal-type, Special and Unique Wastes produced by households are difficult to compile for several reasons, including many of these materials are: banned from MSW landfill disposal; managed by private companies; mixed with other wastes in the households' waste stream; and/or, represent such small volumes that data is not separately recorded during waste sorting and characterization events. The NDEQ's 2008 Nebraska Waste Characterization Study included a waste sort and characterization at the Bluff Road Landfill.

This study identified types of materials disposed at the Bluff Road Landfill, by percentages. Based on percentages from this study an estimate is included in Table 1 on the quantities disposed of at the Bluff Road site in fiscal year (FY) 2010.

Table 1 – Select Materials from 2008 Waste Characterization Study (Bluff Road Landfill)

Material Category	% of Total	Tons Disposed as MSW in FY2010 *
Electronic Waste	0.41%	1,300
Empty Aerosol Cans	0.17%	500
Dry Cell Batteries	0.08%	200
Household Hazardous Waste	0.02%	60**
Other Misc Waste	0.50%	1,500

* Based on FY 2011/2012 MSW Disposal of 304,919 tons. See also HHW technical paper.

** See separate discussion in the paper on HHW.

While limited data is available on total quantities, some data is available on materials diverted from records maintained by the City's Solid Waste Operations. These records indicate the following were diverted through City facilities:

- Tires – Averaged 50 tons annually over the past five years.
- Batteries - Averaged annually 240 vehicle, lawn mower and motorcycle batteries over the past 4 years.
- Appliances – Average 3,000 per year processed at City's appliance de-manufacturing facility over the past five years.
- Scrap metals – Average 540 tons per year over the past five years.
- Paint - Average 1,250 gallons per year over the past 2 years (via EcoStores).

In addition, WasteCap Nebraska has developed a "take-back" program in Lincoln and Lancaster County for CFL's and other fluorescent lamps called "Another Bright Idea." In 2010 approximately 1,810 lamps were recycled and in 2011 this grew to over 2,930 lamps.

Program (Facility/System) Options

The focus of the following discussion includes options that might be available for reduction, reuse and diversion of materials currently subject to disposal. This excludes Universal and Special Wastes currently not part of the MSW stream and not being directed to City disposal sites. Reference should also be made to the papers on HHW, Product Stewardship and Source Reduction for additional waste reduction discussions. Programs for appliances and tires are not considered further since these materials are banned from landfill disposal and public/private collection locations and diversion programs are well established.

Program options vary with the type of materials. The options presented address the following primary areas to focus on increasing source reduction and diversion of select waste types:

- Electronic waste (e-waste)
- Household medical waste and pharmaceutical waste
- Other universal-type wastes – voluntary or mandatory
- Paints (latex and oil)
- Difficult to handle wastes

Electronics Waste (e-waste). Some electronics, if tested, will fail the federal criteria for and be classified as a “hazardous” waste, and thus would require special handling and disposal. Currently, federal and state laws do not require diversion or alternate management of e-waste (as Universal, Special or hazardous Waste) from residential generators; however, there have been numerous efforts to require increased diversion options through voluntary programs, legislation (mandates), and product stewardship initiatives. E-waste also has potential for material recovery, reuse, refurbishment, or recycling of functional items.

The primary options for increased diversion of e-wastes are:

- Increased public education/behavior change
- Residential Disposal Bans
- Voluntary local business collection/take-back
- Product stewardship and extended producer responsibility options
- Inclusion of e-waste drop-off options as part of the local HHW management program (e.g., at a permanent collection facility)
- Prohibiting their disposal in the City’s landfill

A key part of any source reduction, reuse, recycling, and diversion program is educating consumers and waste generators on options to avoid or minimize waste generation and disposal.

Where education initiatives generally focus on voluntary participation, legislation/ordinance can also be used to mandate change and accelerate the implementation of source reduction and alternative management programs. Bans do not necessarily reduce waste but rather use legislation to change management options, create the need for alternate management approaches (which often include reduction, reuse and recycling) and can change purchasing practices; bans may increase the risk for illegal dumping.

Product stewardship and extended producer responsibility are discussed in a separate paper. There are a number of such initiatives focused on e-waste across the United States. According to the Electronics Recycling Coordination Clearing house, currently 24 states have instituted some type of e-waste law for mandatory recovery programs (<http://www.ecycleclearinghouse.org/content.aspx?pageid=10>, retrieved 7/20/2012). These are legislated (generally mandated) types of programs.

Current local business collection/take-back programs in the Planning Area are conducted on a voluntary basis and may involve fees. There are many examples across the US that could be considered for future implementation. Some examples include:

- Encourage special collection events to be underwritten by businesses for the benefit of employees, their families, and possibly others.
- Work with local businesses to expand the number of take-back locations and types of items.
- Grants and subsidies to help encourage participation and offset costs.

Currently, LLCHD HHW collection events do not accept electronics/televisions. To provide for this material in future HHW collection events (or future facilities) would involve added funding and additional logistics. Also, the current HHW collection events are free to local residents and generally focused on the more hazardous and toxic materials in the households, so expanding the list of accepted materials to include electronics would significantly change the focus of the program (e.g., the LLCHD would be handling a Universal Waste that would likely require significant storage requirements).

Permanent collection facilities already exist to a limited extent with voluntary private initiatives. If an outcome of the Solid Waste Plan 2040 includes a recommendation for a permanent HHW facility then additional evaluation of the types of waste to be received may need to include consideration of e-wastes. Logistically, the inclusion in a permanent facility may provide some efficiency (e.g., shared staff, storage areas); however, there would also need to be decisions on whether there would be a charge for drop-off, similar to some existing private facilities.

Household Medical Waste/Pharmaceutical Waste. Medical and pharmaceutical wastes generated by households are of concern when the waste is infectious, hazardous, or even non-hazardous pharmaceutical waste. Improper disposal has the potential to impact human health and the environment. Currently, federal and state law does not prevent or restrict the disposal of these household wastes in the MSW disposal system, but state, federal and local environmental managers all discourage such landfilling and provide or support initiatives to prevent such disposal. Nationally, there have been numerous efforts to develop solutions through voluntary programs, legislation (mandates) and extended producer responsibility initiatives. Pharmaceutical and medical waste generated at health care facilities and laboratories are regulated as Special Wastes in Lincoln and Lancaster County.

The primary options for increased diversion of household medical waste/pharmaceutical waste are:

- Increased public education/behavior change
- Residential Disposal Bans, on items currently exempt under the federal HHW regulations
- Voluntary local business collection/take-back
- Extended producer responsibility options
- Inclusion of these medications in HHW collection events
- Inclusion of these materials at a permanent HHW facility

Because of the chemical, biological, and physical nature of these wastes it can be challenging to simply integrate them with other programs (e.g., handling certain medication (narcotics) requires law enforcement personnel as well as trained technical staff). Integration with other programs can be complicated and not necessarily complimentary.

As noted above LLCHD is in the process of developing a program in conjunction with Nebraska MEDS Coalition which will utilize local pharmacies for the take-back and proper handling and disposal of medications. Requirements outlined in the 2010 Safe and Secure Drug Disposal Act will impact the implementation of this project. These and similar types of take-back programs in conjunction with pharmacies appear to be the major trend in the US. Legislation often discussed at the federal level looks to provide management options through a similar take-back program. Even though pharmacies dispense such medication, take-back programs pose challenges with identification, storage and handling, as well as certain risks to those handling the materials.

Other Universal-type Wastes. Pesticides, mercury-containing items and compact and tube type fluorescent light bulbs can currently be managed through LLCHD coordinated HHW collection events. Batteries and compact fluorescent lights/fluorescent tubes can also be diverted through certain private businesses in the Planning Area (fees may apply). Increasing diversion of these universal-type wastes may be accomplished by one or more of the following options:

- Increased public education/behavior change
- Voluntary local business collection/take-back
- Extended producer responsibility options (mandatory take-back)

- Inclusion of these materials at a permanent HHW facility
- Prohibiting their disposal in the City's landfill

Universal-type wastes collection at a permanent HHW facility may have considerable merit, in combination with private sector initiatives. See also paper on HHW for the potential benefits of a permanent facility for handling universal-type HHW. As noted above, Universal Wastes are hazardous wastes.

Paints (Latex and Oil). Liquid paint is prohibited from disposal in landfills and should not be included in regular household garbage. LMC 8.32.080 includes: paint, dry paint waste, filters, and paint contaminated material as item (20) in Group IV Special Waste; this is applicable to non-residential generators of paint and related materials. Dried paint from residential sources can be disposed of in conjunction with other MSW; however, it is recommended that such paints be completely dry before disposing. Latex paint is not a toxic or hazardous waste; oil based paints can contain compounds which are toxic or hazardous. Currently, federal and state law does not prevent or restrict the disposal of these household wastes in the MSW disposal system. Other than paint that has been badly degraded or contaminated, reuse is considered the most viable, non-disposal, management option.

The primary options for increased reuse and diversion of liquid paint are:

- Increased public education/behavior change
- Voluntary local business collection/take-back (e.g., current EcoStore)
- Extended producer responsibility options.
- Inclusion in HHW collection events
- Inclusion of this material at a permanent HHW facility

Latex paint is not typically been accepted at LLCHD coordinated HHW collection events. A permanent HHW facility could also receive, store, blend and manage the liquid paint and residual (paint, paint sludges, metal and plastic containers). Paint collection at a permanent HHW facility may have considerable merit, in combination with private sector initiatives. See also paper on HHW for the potential benefits of a permanent facility for handling HHW. As noted above, dried paints are not hazardous wastes, but are a Special Waste if they originate from non-residential sources.

Difficult to Handle Materials. Materials such as large timbers, bulky and non-compressible items as well as certain household items (e.g., compressed gas cylinders, fire extinguishers, ammunitions) pose challenges for source reduction and may not be easily recycled. These materials may also be damaged and degraded to the point where they necessitate disposal.

Program options for these materials may include:

- Increased public education
- Voluntary local business collection/take-back (e.g., current EcoStore)
- Extended producer responsibility options.
- Inclusion in HHW collection events
- Permanent collection facility

While some of these materials may not have source reduction options, there may be additional recycling, diversion and processing options that could be encouraged to minimize quantities requiring disposal or reduce the risk to human health for sanitation workers that might be exposed to them. Permanent collection facilities may not be limited to HHW type facilities; they may include citizen drop-off recycling facilities or processing centers for these materials.

Options Evaluation

Consistent with the guiding evaluation criteria developed for use in the Solid Waste Plan 2040, Universal, Special and Unique Waste programs have been evaluated based on the following considerations:

- **Waste Reduction/Diversion:** Programs that eliminate or minimize household or business related hazardous waste or reduce the toxicity of materials going to the City's landfill are consistent with the waste management hierarchy and are protective of human health and the environment. The options for reducing the quantities and risks associated with these wastes are consistent and compatible with those discussed in separate technical papers on source reduction, zero waste, product stewardship, and HHW.
- **Technical Requirements:** Existing programs for Universal and Special Wastes provide a strong foundation upon which additional programs or material diversion options could be established. A consolidated program for handling of HHW and household-type Universal, Special and Unique Wastes would likely optimize the number of materials diverted and efficiency associated with management of these materials. A permanent facility, in conjunction with added educational outreach is considered a viable and potentially most cost effective approach to increasing diversion from the City's Landfill and may provide additional opportunities to promote non-disposal options. Continued partnerships with private business, non-profits, and organizations specializing in managing these waste types will also be important to optimizing diversion. Combining collection of Universal and Special Wastes (from households and CESQGs) with HHW programs at a permanent facility should provide for the needed material handling capacity, greater efficiencies in operation, reduce risk to public and workers (e.g. trained staff and facility designed for handling such materials) and an effective "one-stop shop" for residents.
- **Environmental Impacts:** Providing safe management and alternative disposal options for Universal, Special and Unique Wastes will help minimize the environmental impacts that could result from improper storage, handling, transportation and disposal. Increased management options will also provide environmental benefits by keeping such wastes out of sewer, water supplies and landfills and as such reduce the long-term risk for release of toxics.
- **Economic Impacts:** Because of the cost of managing hazardous waste there will likely be an overall increase in costs as the quantities increase or systems and facilities are added to the existing management system. Product stewardship and extended producer responsibilities may serve as mechanisms to reduce direct costs to government, but specialized programs may still require government support such as supporting expansion of private business take-backs and reuse of hard-to-manage materials. From a community perspective the manufacturer/producers investments may also provide economic development and local market opportunities, with associated employment opportunities. Permanent facilities will have costs similar to HHW programs and require identification of funding mechanisms for construction, operation and material disposal (since many of the materials may be a form of hazardous waste).
- **Implementation Viability:** Implementation may or may not require added legislative or regulatory changes; this will be material and program specific. Social/political acceptability may be influenced by cost; however, on a cost per household per month, new program cost should be small. While a portion of existing programs is supported by non-governmental entities, it is anticipated that an expansion of programs targeting hazardous materials generated at the household level may require added government

involvement, even if is limited to education or simply expanding the list of material handled through current government supported programs. New facilities will require land, siting considerations and possibly special permits.

Relationship to Guiding Principles and Goals

As it relates to the Guiding Principles and Goals of the Solid Waste Plan 2040, promoting and expanding management of Universal, Special and Unique Wastes management programs would be applicable as further noted below:

- **Emphasize the waste management hierarchy:** management of Universal, Special and Unique Wastes is directly related to the waste management hierarchy in that it places maximum emphasis on reducing, reusing, and recycling to avoid or minimize wastes disposed in City landfills.
- **Encourage public/private partnerships:** many residential-type Universal, Special and Unique Wastes are currently received and managed by private businesses and non-profits. Programs under development and considered for this Plan rely on the cooperative efforts and partnership of local government and business stakeholders (e.g., Nebraska MEDS Disposal Project with LLCHD).
- **Ensure system capacity:** Universal, Special and Unique Wastes programs require the necessary infrastructure and system approaches to ensure that materials will not be discarded and can be reused, recycled and possibly returned to beneficial use. As additional materials are diverted, added system capacity may be necessary.
- **Engage the community:** Increased diversion of residential-type Universal, Special and Unique Wastes will require an engaged community because it ultimately seeks to change the current management/disposal ethos by including lifestyle and societal changes. Public education to engage the community will be important to sustaining existing programs and increase program participation.
- **Embrace sustainable principles:** Reduction in quantity and toxicity of Universal, Special and Unique Waste is consistent with sustainability principles in emphasizing the minimizing health, safety, environmental and social impacts and maximizing economic benefits of a product (and its packaging) through all lifecycle stages.

Summary

Programs for Universal, Special and Unique Wastes target those materials that could pose a threat to the environment and human health. Universal Wastes are hazardous wastes and many of the Special Wastes also exhibit hazardous characteristics and require special handling. The City-County currently support a wide range of public and private waste management and reduction programs for these wastes. The existing LLCHD (LMC 8.32.080) Special Waste permitting program is unique within Nebraska and provides a very effective mean of minimizing the quantity of potentially hazardous or toxic waste disposed in the City's Bluff Road Landfill.

While residential and certain types of Universal and Special Wastes (e.g., CESQG waste) can be accepted at the Bluff Road Landfill, the landfill is not obligated to take commercial Special Waste and as such can be selective in the materials it receives. Current diversion programs include private take-back facilities, City-County programs, non-profit organizations and educational efforts.

Programs that eliminate or minimize household or business related hazardous waste or reduce the toxicity of materials going to the City's landfill are consistent with the waste management

hierarchy and are protective of human health and the environment. Options to increase diversion of these materials, especially from household sources include: public education/behavior change, support of existing voluntary efforts, development of new voluntary take-back programs for materials not currently handled, legislation for mandatory retail take-backs, periodic collection events, disposal bans, and/or development of one or more fixed facilities.

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APPENDIX

Lincoln Municipal Code - Section 8.32.080

Special Waste Disposal; Permit Required.

(a) The following solid waste materials are hereby designated as special wastes:

Group I: Wastes That May Contain Free Liquids

- (1) Cooking oil and grease;
- (2) Cooking grease trap waste;
- (3) Mud or sand from sumps or traps;
- (4) Septic tank waste;
- (5) Chemicals and waste from portable or chemical toilets;
- (6) Sewage or other organic residues or sludges;
- (7) Sludges containing a liquid concentration of 80% or more by weight or material producing free liquids in a Standard Paint Filter;

Group II: Petroleum-based Wastes

- (8) Petroleum type grease trap waste;
- (9) Sludges from petroleum tanks;
- (10) Petroleum contaminated refuse, soil, or other materials;
- (11) Petroleum contaminated water;
- (12) Oil, lubricants, hydraulic fluids, fuels, and other petroleum products;

Group III: Empty Containers

- (13) Pressurized containers or containers that may explode upon crushing;
- (14) Containers over five gallons in size;
- (15) Empty container labeled "DANGER" or which once contained hazardous material;
- (16) Fuel tanks;

Group IV: Solvents, Absorbents, Filters, and Residues

- (17) Solvents, degreasers, strippers, thinners, and related products;
- (18) Refuse containing solvents, degreasers, strippers, or thinners;
- (19) Lime or other inorganic residues or sludges;
- (20) Paint, dry paint waste, filters, and paint contaminated material;
- (21) Fly ash;
- (22) Bottom ash;

Group V: Hazardous or Toxic Chemicals or Chemical Products

- (23) Antifreeze or treatment chemicals for boilers, heat exchangers, cooling towers, and similar uses;
- (24) Chemicals labeled WARNING for toxics and pesticides;
- (25) Pharmaceutical products;
- (26) Adhesives, sealants, coatings or catalysts;
- (27) Material containing between 25 and 100 percent of the maximum concentration of any Toxic Characteristic Leaching Procedure (TCLP) listed chemical as referenced in 40 CFR Part 261, subpart C, Chapter 261.24, Table 1 or that exceeds a concentration of 0.3 mg/kg of nickel;
- (28) Hazardous or potentially hazardous waste or chemicals labeled "DANGER";

Group VI: Miscellaneous

- (29) Treated or untreated infectious waste from hospitals;
- (30) Treated or untreated infectious waste from other than hospitals;
- (31) Waste containing or likely to contain polychlorinated biphenyls (PCB);
- (32) Waste containing asbestos;
- (33) Material other than asbestos that could create a health hazard if airborne;
- (34) Wood that has been treated with hazardous or toxic chemicals;
- (35) Any other solid waste which requires special management to ensure protection of public health, safety, or the environment based upon the physical, chemical, or biological properties of the waste.