Household Hazardous Waste Facility
Feasibility Study

Prepared for:

Peoria County
Office of Health and Human Services
Recycling and Resource Conservation
3116 N. Dries Lane, Suite 200
Peoria, IL  61604

By

Patrick Engineering, Inc.
300 W. Edwards Street, Suite 200
Springfield, IL  62704
Project # 20903.013

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EXECUTIVE SUMMARY

Patrick Engineering Inc. (Patrick) has completed a household hazardous waste (HHW) facility feasibility study for Peoria County, Illinois (County). The objective of the feasibility study is to provide an evaluation of HHW collection and disposal options in order for the County to make informed decisions about its involvement in establishing an HHW facility in Peoria County.

HHW presents a potential safety and environmental hazard to the citizens of Peoria County through improper storage and disposal. A comparison of records of previous HHW collection events in Peoria County and other Illinois communities and data from permanent collection facilities in Illinois and other states show that Peoria County generates HHW in types and quantities similar to state and national averages. Depending on participation rates from the three-county area, including Peoria, Tazewell and Woodford Counties, a permanent facility could collect between 150,000 and 820,000 pounds of HHW annually.

The household exemption under the Resource Conservation and Recovery Act (RCRA) would allow operating a permanent facility without permitting it as a hazardous waste facility as long as only residential waste is accepted. The Illinois siting process for pollution control facilities is also exempted for HHW provided the host community waives the siting approval process. However, the facility should maintain insurance for any future clean-up and remediation liability costs under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). The facility will also require State permitting as a “solid waste treatment and/or storage facility”. If the facility were to accept hazardous wastes from small business generators, both the RCRA permit and State siting process would be required.

The Illinois Environmental Protection Agency (IEPA) currently provides State support for regional HHW collection facilities through agreements in which IEPA assumes “generator status” under CERCLA and all costs and responsibilities for transportation and disposal of the collected HHW. The IEPA disposal contractor will also provide training for facility staff. It is uncertain, however, whether future State budgets will allow the expansion of this program to additional facilities.

Patrick compared the advantages and disadvantages of a permanent facility to several other options for HHW management, including single-day events, curbside pickup and mobile or
satellite collections. Research to date has demonstrated that permanent HHW facilities collect more HHW than the other options and at a lower cost per participant. Projected costs per participant for a permanent facility for the County (excluding disposal costs covered by IEPA) are higher than single-day events, but the permanent facility is far more cost effective, on a cost per pound basis, at capturing HHW and diverting it from improper disposal.

Patrick created a conceptual design and operating plan for a facility to meet the projected needs for Peoria County regional HHW collection. The building is a pre-engineered, commercial steel building, clear span, with insulation and fire-rated internal walls, of approximately 5400 square feet. The building’s floor is a sealed, custom concrete slab at the same elevation as the car queuing/receiving area. The interior space is divided between a receiving/processing area, a storage area, an office with lavatories, and a swap shop. Incoming vehicles would stop under a covered unloading area to drop material. Attendants unload the vehicle and move material to a designated holding/sorting area. Upon delivery of the material, the cars exit the site or drive around the building and park to visit the swap shop.

A ramp and covered loading area is provided to facilitate loading of trailers from the storage area. The storage area could potentially hold 325 drums or more. Flammables and other high hazard materials such as mercury would be removed from the main building to a hazmat storage structure/container opposite the loading area. Fire and spill control systems would be designed into the structures.

Patrick estimates the facility could be developed for between $750,000 and $1,200,000. Annual operating costs including promotion and insurance are estimated to be between $130,000 and $184,000 but may be higher if an independent contractor is chosen to operate the facility.

The results of the study indicate that a permanent regional HHW collection facility located in Peoria County is a feasible and effective option to maximize the collection of HHW and divert it from improper disposal. While a more expensive option than continuing the biannual one-day collection events, a permanent facility will provide greater convenience to the public, higher participation rates, much improved capture of HHW, and improved health and environmental safety for Peoria County residents.

Based on the analyses performed and conclusion, it is recommended that Peoria County consider the development of a permanent HHW collection facility.
INTRODUCTION

Peoria County is continually seeking effective HHW management for its residents. HHW is a problem in many ways: it is a threat to the overall quality of the environment due to potential leaching from municipal solid waste landfills, improper disposal in septic systems, illegal dumping, or burning; it is a danger to waste collectors and sewage workers when residents improperly dispose of HHW with regular household wastes or in municipal sewage systems; and it is a direct poison and injury threat to adults, children and pets in households that do not safely store or dispose of HHW.

The Consumer Products Safety Commission reports that one out of every 10 children is injured by chemicals in the household to the point where additional information to treat the child is required. In comparison, only one in one thousand workers is injured by a chemical at work. The American Association of Poison Control Centers (AAPCC) recorded instances of poisonings by household chemicals in 2007\(^1\) as follows:

<table>
<thead>
<tr>
<th>Substance</th>
<th>All ages</th>
<th>&lt; 5yrs of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTC drugs / pharmaceuticals</td>
<td>1,070,478</td>
<td>504,771</td>
</tr>
<tr>
<td>Cosmetics/ personal care products</td>
<td>225,410</td>
<td>172,541</td>
</tr>
<tr>
<td>Household cleaning substances</td>
<td>216,228</td>
<td>122,832</td>
</tr>
<tr>
<td>Pesticides</td>
<td>96,307</td>
<td>44,644</td>
</tr>
<tr>
<td>Alcohols</td>
<td>82,432</td>
<td>23,574</td>
</tr>
<tr>
<td>Sanitizers/antimicrobials</td>
<td>67,445</td>
<td>34,575</td>
</tr>
<tr>
<td>Hydrocarbons/petroleum products</td>
<td>48,497</td>
<td>15,909</td>
</tr>
<tr>
<td>Arts/crafts/office supplies</td>
<td>40,140</td>
<td>29,604</td>
</tr>
<tr>
<td>Total</td>
<td>1,846,937</td>
<td>948,450</td>
</tr>
</tbody>
</table>

A permanent HHW facility in Peoria County is expected to reduce potential environmental releases and the number of accidental poisonings by making HHW disposal more convenient and timely for residents, which will increase the amount of HHW that is properly collected and disposed. The facility would be the first of its kind in central Illinois.

Peoria County tasked Patrick to conduct a feasibility study to determine issues that will contribute to the costs and effectiveness of a permanent HHW facility, and to estimate the

\(^1\) Bronstein (2007)
potential costs of facilities under different operation conditions (operational hours, level of staffing, single vs. multi-county coverage, etc.).

**OVERVIEW OF HOUSEHOLD HAZARDOUS WASTE**

**Definition and Composition of Household Hazardous Waste.** Hazardous waste is defined as a waste that may cause or significantly contribute to injury or death. Household hazardous waste (HHW) is generally defined as household wastes that are toxic, flammable, corrosive, or reactive. The Illinois Household Hazardous Waste Collection Program Act (415 ILCS 90/1) defines HHW as:

… a consumer disposed waste product intended for household use generally containing constituents that make its disposal in municipal waste landfills or incinerators undesirable. Household hazardous waste includes, but is not limited to, the following:

1. Waste oil
2. Petroleum distillate-based solvents.
3. Oil based liquid paint, paint strippers, and paint thinners.
4. Herbicides and pesticides except for purposes of this Act, antimicrobial and disinfectant products are excluded.

According to the Consumer Products Safety Commission, the average household contains 63 different products involving hundreds of different chemicals that can be classified as HHW. Common HHW includes:

- Used mercury, nickel-cadmium and lead-acid batteries;
- Oil-based paints, varnishes, stains and lacquers;
- Paint thinners and strippers;
- Adhesives, caulks, tars and sealers;
- Pool, aquarium, lawn and garden chemicals;
- Pesticides and other poisons;
- Used oil, antifreeze, transmission and hydraulic fluids;
- Old gasoline, solvents, lighter fluid, propane and other flammables;
- Household, automotive and drain cleaners;
- Polishes and waxes;
• Refrigerants and aerosols;
• Fluorescent and HID lamps;
• Cosmetics and pharmaceuticals; and
• Art and hobby chemicals.

More Details can be found in Appendix A.

The following charts show a breakdown of the types of HHW collected at IEPA one-day collection events during 2004 though 2008 (Figure 1) and at the last three Peoria County HHW one-day collection events in 2003, 2005 and 2008 (Figure 2). The charts indicate that HHW collected from Peoria County is similar to the average statewide collection of HHW by IEPA from around Illinois.
Regulations and Guidelines. The federal regulations governing hazardous waste are found in the Resource Conservation and Recovery Act (RCRA), Subtitle C (Title 40, Code of Federal Regulations Part 261). The RCRA program is designed to control the management of hazardous waste from its generation to its ultimate disposal – from “cradle to grave.” The comprehensive regulations provide guidelines for industrial and commercial hazardous waste but exclude household hazardous waste (HHW). Household products often contain the same hazardous components as products used in commercial or industrial operations, but, since the resulting waste is generated by households, it is exempt from most environmental regulations including Subtitle C regulation.

However, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. §§ 9601, et seq. (or Superfund as the program is more commonly referred to) does not exempt hazardous waste by virtue of its origin. As a collection point for HHW, public agencies that collect HHW are deemed “generators” of the material and thus potentially liable under CERCLA for any future clean-up and remediation costs. Agencies must accept and plan for the potential liability. They should obtain and maintain insurance, request that service providers list the agency as “additionally insured” and always ask for “occurrences” versus “claims made” coverage.
The State of Illinois’ regulations for HHW collection are established in the Illinois Environmental Protection Act. Section 22.16b (d) of the Act states that the Illinois Environmental Protection Agency (IEPA), “shall establish household hazardous waste centers in appropriate places in this State” and “may operate and maintain the centers itself or contract with other parties for that purpose.” Section 22.16b (d) further states that the Agency is responsible for the proper disposal of waste from the centers, and that the centers are not subject to (a) regulation as hazardous waste facilities under RCRA, and (b) local siting approval if the governing authority waives siting approval procedures.

Permanent HHW facilities are considered regional collection centers. The Act states that a regional collection center means a facility permitted by the Agency for the storage of household hazardous waste must be open to a region and cannot prohibit waste from outside the local jurisdiction.

Prior to construction of a permanent HHW collection facility, the State of Illinois will require an application for a “Solid Waste Management Permit to Develop Treatment and/or Storage Facilities”, which has a 90-day review period. Following approval of the permit and construction of the facility, an “Application for Operating Permit” must be submitted. Approval of the operating permit has a 45-day approval period. For reference, see IEPA permit application forms LPC-PA1, LPC-PA3, LPC-PA4, LPC-PA8, LPC-PA9 and LPC-PA16.

In order to address CERCLA liability concerns, the IEPA accepts the role of “generator” of the wastes collected, and chooses to handle and dispose of the waste as if it were regulated hazardous waste. As part of this responsibility, the IEPA retains sole authority to direct wastes to particular facilities. In addition, the IEPA transfers as much liability as possible to its collection contractors who are required to add the local operating agency and the IEPA to liability insurance policies. The contractors must maintain liability insurance for any injury, damage or clean-up costs that might occur during the pick-up, transportation and disposal of the HHW. Liability for collection and storage of the waste remains the responsibility of the facility operator.
However, these protections cover only the wastes deemed acceptable and listed in the IEPA agreements. IEPA contractors will not accept ammunition, explosives, radioactive materials, lead-acid batteries, compressed gas containers (other than aerosols), and non-special, non-contaminated wastes, including trash and non-hazardous debris (this usually includes latex paints). Should the facility accept and dispose of additional materials, the operating agency must accept generator status and the consequential liability for disposal of these materials.

Conditionally Exempt Small Quantity Generators (CESQG). While households are excluded from RCRA regulation, businesses are not - even if they are using the same types of materials used by households. Small business wastes can represent a large portion of the hazardous wastes entering the municipal waste stream. A Washington State study estimated that the average small business generates 1,400 pounds of hazardous waste per year (119 pounds per month). As with HHW, these wastes pose hazards to human health and the environment.

Non-residential generators of small amounts of hazardous waste are known under RCRA as "conditionally-exempt, small quantity generators" (CESQGs). CESQGs are those that generate less than 220 pounds of hazardous waste in a month or have an accumulation of less than 2,200 pounds of hazardous waste. CESQGs in Illinois are required to:

1. Identify all hazardous wastes they generate,
2. Store all hazardous wastes in containers such as drums, and
3. Hire a licensed special waste hauler to transport their hazardous wastes to a facility permitted to accept it.

Many CESQGs send their hazardous waste to municipal solid waste landfills that are not permitted to accept hazardous waste. Many small businesses do not identify their wastes as being “hazardous”, are not sure how to manage hazardous waste, or do not want to pay the costs associated with hiring a hazardous waste contractor to handle proper disposal.

The recognition of this problem has prompted some communities to establish programs in which businesses can bring hazardous wastes, for a small fee, to the household hazardous waste
collection facility. Permanent facilities in surrounding states, like Indiana and Iowa, accept CESQG waste in this manner. In these cases, the facilities must operate under a RCRA permit.

In Illinois, however, for a HHW facility to accept CESQG waste, it must first go through the local siting process outlined in the Illinois Environmental Protection Act (415 ILCS 39.2). This lengthy and expensive process would increase the County’s burden in establishing a permanent facility. In addition, unlike for HHW, IEPA will not assume generator status or responsibility for transportation and disposal of CESQG waste. If the County wishes to accept CESQG waste at the facility, it is recommended to initially only accept HHW, then after a period of successful operation, consider going through the local siting process. If the County believes it will consider this option down the road, it will be important to consider the potential impacts on facility design, storage, etc. during the facility design stage.

**OSHA.** The purpose of Occupational Safety and Health Act (OSHA) 29 CFR 1910 is to inform workers of workplace risks, identify and ameliorate workplace hazards, and train workers in safe work practices and the use of safety equipment. Since HHW programs do not use the waste brought to them for disposal, not all OSHA hazard communication and hazardous material requirements apply to their activities:

- Programs that store or package HHW under the DOT Lab Pack exemption (49 CFR 173.12) are not required to have material safety data sheets for the products or label the HHW (under 29 CFR 1910.1200), but must follow 29 CFR 1910.1200 requirements for hazard evaluation and training, and the requirements of 29 CFR 1910.132 through 138.
The purpose of 29 CFR 1910.1200 (hazard communication) is to ensure that chemical hazards are evaluated, and information concerning hazards and appropriate protective measures are communicated to workers. Hazard communication is to be accomplished by means of a comprehensive program, which should include container labeling and other forms of warning, material safety data sheets, and employee training.

29 CFR 1910.106 sets standards for facilities that store flammable and combustible liquids. 106 (e) applies to operations involved in mixing which do not involve chemical reaction. Flammable and combustible liquids must be stored in closed containers that are labeled according to hazard class. 29 CFR 1910.106 sets requirements for proper storage, ventilation and electrical wiring in rooms in which flammable and combustible liquids are stored.

29 CFR 1910.132 through 138 provides requirements for the use of personal protective equipment (PPE) for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers. An assessment must be performed to determine if hazards are present, or likely to be present, which necessitate the use of PPE and documented in writing. Workers must use PPE appropriate to the hazards identified that is not defective or damaged, and must be trained in the use and care of the PPE.

29 CFR 1910.38 sets requirements for written emergency action plans and fire prevention plans. The emergency action plan must cover actions that must be taken to ensure employee safety from fire and other emergencies. The fire prevention plan must include a list of the major workplace fire hazards, their proper handling and storage procedures, potential ignition sources and control procedures, and a description of fire protection, training equipment or systems in accordance with 29 CFR 1910.157 which sets standards for portable fire extinguishers.

Communities are encouraged to follow best practices in the operation of their HHW programs. 29 CFR 1910.120 (p) sets requirements for treatment, storage and disposal (TSD) facilities. It is a useful guide for developing procedures for household hazardous waste programs. HHW program managers should consider the following areas of 29 CFR 1910.120 in developing operating procedures:
• Safety and health program - 29 CFR 1910.120 (b)
• Medical surveillance program - 29 CFR 1910.120 (f) and Retention of medical records - 1910.20 (d)
• Decontamination program - 29 CFR 1910.120 (k)
• Training program - 29 CFR 1910.120 (e)

EXISTING HHW COLLECTION PROGRAMS IN ILLINOIS

IEPA-Sponsored Single-Day Collection Events. The Illinois EPA coordinates one-day household hazardous waste collections each year in the spring and fall. The first of these collections began in November 1989. Since then, 262,100 households have participated in 292 events, with 53,765 drums of material collected.

The Illinois EPA seeks and encourages communities or organizations to cosponsor household hazardous collection events. Applications are accepted each fiscal year and are kept active indefinitely. Events are selected each spring and fall utilizing a ranking system with the number of collections determined by available funding. The Illinois EPA provides funding and contractor oversight, and assumes waste generator status. An Agency contractor assures that all wastes are properly containerized, manifested and safely transported to their ultimate destination. Cosponsors provide promotion and advertising, site location and volunteers to supervise traffic control, greet and survey participants and distribute information for the events.

Collections are scheduled on Saturdays, from 8 a.m. to 3 p.m., for the greatest convenience of working families. Citizens are asked to bring harsh chemical cleaners, paints, thinners, antifreeze, weed killers, insecticides and pesticides, and similar hazardous household products. Explosives, propane tanks, fire extinguishers, smoke detectors, agricultural chemicals and business wastes are not accepted. Citizens are encouraged to use alternative venues to dispose of latex paint, lead-acid batteries and used motor oil, although used motor oil is accepted.
Household hazardous-waste collections, funded by statewide fees on landfilled, non-hazardous solid wastes, are free to the public. From 2004 through 2008, an average of $1.52 million per year has been allocated for these projects.

Peoria County has participated in single-day collection events sponsored by IEPA in 2003, 2005, and 2008. Using these three events as the most representative sample, Peoria County has collected at its events a total of 602 drums (197 in 2003), 200 in 2005, and 505 in 2008) of HHW (See Table 1 for the 55-gallon drum equivalents). Countywide participation was estimated at 0.74%, 0.72%, and 1.4% at each respective event.

Based on cost data provided by the IEPA, the average cost per participating household for each single-day event in Peoria County is roughly $70, and the average cost per drum of waste collected is approximately $300. However, the costs to the County include payment of $5,000 for the 2003 event and $17,000 for the 2008 event as a co-sponsor, plus approximately $3000 to $5000 for education and promotion of each event. The cost to the County was thus approximately $34,000 for three events, or $8.80 per household (a total of 3,870 households in three years) and $37.70 per drum (a total of 902 drums in three events over four years).

The County has indicated that single-day collection events collect less than the desired volume of HHW and have a less than desired number of participants, primarily because residents are unwilling to store their HHW for long periods of time until a collection event is scheduled.

Permanent HHW Facilities. In 1998, there were 529 permanent HHW collection facilities in the United States. Only four permanent facilities for disposal of HHW are located in Illinois: in Chicago, Naperville, Rockford, and Lake County, Illinois. All four facilities operate under an inter-governmental agreement with the IEPA for the disposal of the collected waste. The local agency assumes the costs and liability of operating the facility and collecting and storing the HHW and the IEPA assumes “generator status” and the costs and liability of transporting and disposing of the HHW through its contractors. None of these facilities accept business waste. A brief description of each facility and its collection statistics is provided below.
Naperville. The Naperville facility was the first permanent HHW collection facility in Illinois, beginning operations in October 1992. The City of Naperville Public Works Department operates the facility, although staffing is provided by properly trained City firefighters. The facility is located behind one of the city’s fire stations and was built to match the fire station’s construction. The capital cost for construction was over $600,000 including a major $475,000 site upgrade in the year 2000. The facility is an 800 square foot steel frame and concrete block building with a covered unloading area with a second material storage structure and a second paint-bulking unit. The building features three overhead doors, skylights, a triple basin drain, sprinklers and a gas, infrared heating system.

The facility is open every Saturday and Sunday, excluding holidays, from 9:00 a.m. to 2:00 p.m. In the last five years, the facility has collected approximately 6335 drums of HHW (through June 2004); an annual breakdown of HHW collection is shown in Table 2. Naperville is the fourth largest city in Illinois with a population of 128,000 people. The Naperville facility began accepting waste from outside the Naperville area in 1996, and currently draws participants from a seven county area, according to data from the IEPA. Based on the combined number of households in DuPage and Will counties (493,143 households, U.S. 2000 census), the participation rate at the Naperville facility was 2.5% in 2008.

Heritage Environmental Services, an environmental contractor, transports and disposes HHW collected at the facility. According to Ms. Beth Lang, Strategic Services Manager, the operating cost for the facility is approximately $180,000/year excluding disposal costs. DuPage, Kane and Will Counties provide portions of these costs. Illinois EPA covers all HHW disposal costs for the facility.

Rockford. The Rockford facility is operated by the City of Rockford Public Works Department, and has been open since April 1995. The facility is located on property owned by the local sanitary district. The facility consists of a construction trailer used for office space and a prefabricated explosion-proof building purchased by the city with a storage capacity of 80 drums. The capital cost for the facility was less than $100,000, according to Mr. Tom Tullock, the former Public Works director for the City of Rockford.
Facility hours are every Saturday from 8:00 a.m. to 4:00 p.m. and on Sundays from Noon to 4:00 p.m., except holidays. The facility accepts several different HHW items. In the last five years, the facility has collected over 5,600 drums of HHW. The Rockford facility has also grown into a regional collection center since its inception, accepting HHW from outside of Rockford’s boundaries.

The Rockford facility is operated by Clean Harbors, Inc., an environmental contractor. Clean Harbors personnel staff the facility and transport and dispose of collected HHW. According to Mr. John Gessner, the current Public Works director for the City, the City pays Clean Harbors approximately $70,000 per year for operation and maintenance of the facility. Illinois EPA covers all HHW disposal costs for the facility.

Though no recent data on the number of participants was available from Rockford, the HHW facility had participation rates ranging from 2% to 4.3% prior to 2003.

**Lake County.** The Lake County HHW facility is operated by the Solid Waste Agency of Lake County (SWALCO) and has been open since September 2002. The facility is located in Gurnee, Illinois, and consists of a brick building with office space, storage space for equipment and supplies used at HHW collection events, and a separate space dedicated to HHW container storage. The HHW storage space is divided into bays separated by cinder blocks, and is surrounded by drainage trenches to collect any HHW that may be spilled. The capital cost for the facility, not including property, is estimated at $1.5 million with approximately $1 million dedicated to the 4000 square foot warehouse/storage facility.

Initially, the host agreement between Gurnee and SWALCO did not allow residents to drop off HHW at the Lake County facility. Instead, one-day, mobile collection events were held between March and November, and the collected materials are transported back to the HHW facility. In recent years however the facility has been open for public drop-off of HHW.
approximately 21 days a year. HHW collection events are generally conducted on the weekends from 8:00 a.m. to 2:30 p.m.

In 2007 and 2008, SWALCO has conducted twenty HHW collection events, collecting 2,955.3 drums of HHW from approximately 11,666 households. An additional 688.1 drums were collected from 2111 households at the central facility. With 216,297 households in Lake County (2000 US Census data), the HHW facility had a participation rate of 2.9% in FY 2007, and 3.1% in FY 2008.

SWALCO’s operating budget for the 2008 HHW collection program was $221,800. Approximately $117,400 was paid to Clean Harbors Environmental Services, which includes $71,646 for the costs of the mobile collection events, $35,270 for the public drop-off days at the facility, and $10,502 for paint bulking activities. SWALCO’s operating costs were $33 per participant, and $123 per drum of HHW collected, excluding disposal costs. Illinois EPA covers all HHW disposal costs for the facility.

**Chicago.** The Chicago Household Chemicals and Computer Recycling Facility is located at 1150 N. North Branch Street in Chicago. The facility is operated by the Chicago Department of Streets and Sanitation and, unlike Illinois’ other HHW facilities, also collects end-of-life electronics. The facility opened in October of 2006 and is operated 2 days a week (Tuesday from 7:00am - 12:00pm, and Thursday from 2:00pm - 7:00pm) and the first Saturday of every month from 8:00am - 3:00pm, excluding holidays.

According to Kevin Schnoes, Director of Research, the facility has collected about 700,000 lbs of HHW from approximately 22,000 households from October 2006 through May of 2009. Operating costs are approximately $15,000/month for the HHW operations.

The site was a former animal incinerator operated by the Dept. of Streets & Sanitation. The incinerator ceased operations around 1998. Subsequently, it was used for the storage of city vehicles, such as sewer vacuum trucks. In 2003, DOE initiated plans to convert the facility to an
HHW facility. Construction began in September 2005. The total building footprint is approximately 24,000 ft² (12,000 ft² for electronics recycling and 12,000 ft² for HHW). The total cost for the facility construction was $3,800,000. Funding support for the project came from the following sources:

- IEPA 319 Grant - $306,000
- Illinois Department of Commerce and Economic Opportunity - $780,000
- Illinois Clean Energy Fund - $10,000

**AMOUNTS OF HHW COLLECTED**

The USEPA estimates that, nationwide, Americans generate 1.6 million tons of (unregulated) household hazardous waste per year. This is equivalent to approximately 30 pounds per year per household. However, an average household can accumulate 100 pounds of hazardous materials in storage in garages, basements, sheds and cabinets.

Statewide, IEPA-sponsored, one-day HHW events collected 21,851 drums from 122,939 participating households from 2004 through 2008. This is an average 0.18 drums per household. The IEPA does not collect data on the weight of waste collected, but, at an estimated 150 pounds per drum, the amounts collected would be approximately 27 pounds per household.

In cooperation with the IEPA, Peoria County has conducted three one-day collection events for HHW. The amounts that were collected at these events are listed in Table 1.

<table>
<thead>
<tr>
<th>Date</th>
<th># 55 Gal Drums</th>
<th># Participants</th>
<th># Drums/Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>197.40</td>
<td>1011</td>
<td>0.20</td>
</tr>
<tr>
<td>2005</td>
<td>199.80</td>
<td>974</td>
<td>0.21</td>
</tr>
<tr>
<td>2008</td>
<td>505.21</td>
<td>1885</td>
<td>0.27</td>
</tr>
</tbody>
</table>
Using the estimate of 150 lbs/drum, this corresponds to 30 to 40.5 pounds per participant, which corresponds with national estimates of 30 pounds per household per year.

Some recent data from the four permanent facilities operating in Illinois is shown in Tables 2, 3, 4 and 5.

<table>
<thead>
<tr>
<th>TABLE 2. NAPERVILLE HHW COLLECTION FACILITY DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
</tr>
<tr>
<td>------</td>
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<tr>
<td>2007</td>
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<tr>
<td>2008</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>TABLE 3. ROCKFORD HHW COLLECTION FACILITY DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>2007</td>
</tr>
<tr>
<td>2008</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 4. LAKE COUNTY HHW COLLECTION FACILITY DATA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>2007</td>
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<tr>
<td>2008</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 5. CHICAGO HHW COLLECTION FACILITY DATA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>2007</td>
</tr>
<tr>
<td>2008</td>
</tr>
</tbody>
</table>

The volumes collected from each participant at these permanent facilities are comparable to those at the one-day events; however, annual participation data may double-count those households who use the facility more than once a year.

Patrick also examined data from permanent facilities outside the State of Illinois. Information was gathered on 41 facilities serving communities of comparable size to Peoria County (50,000-250,000 households) in Kansas, Iowa, New York, California, Washington and
other locations. The number of participants at these facilities was graphed against the amount of HHW collected and a best-fit trend line calculated, as seen below in Figure 3.

![Figure 3. HHW collections at Selected Facilities Servicing 50k to 250K Households](image)

The trend line predicts an average of approximately 65.2 pounds per participant. This is higher than the rate experienced at Illinois collections because, unlike Illinois, the majority of these facilities encourage participants to bring latex paint and lead acid batteries. Average collections by material types are shown below in Table 6.
TABLE 6. AVERAGE COLLECTIONS OF HHW PER PARTICIPANT AT SELECTED OUT-OF-STATE FACILITIES

<table>
<thead>
<tr>
<th>Facility Location</th>
<th>Latex paint</th>
<th>Used oil</th>
<th>Lead-acid batteries</th>
<th>Other HHW</th>
<th>Total per participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td>51.5 lbs (3 facilities)</td>
<td>24.0 lbs (3 facilities)</td>
<td>4.5 lbs (3 facilities)</td>
<td>35.4 lbs (3 facilities)</td>
<td>115.4 lbs</td>
</tr>
<tr>
<td>Kansas</td>
<td>13.0 lbs (6 facilities)</td>
<td>12.7 lbs (6 facilities)</td>
<td>2.3 lbs (6 facilities)</td>
<td>47.3 lbs (6 facilities)</td>
<td>75.3 lbs</td>
</tr>
<tr>
<td>California</td>
<td>17.3 lbs (24 facilities)</td>
<td>8.2 lbs (20 facilities)</td>
<td>7.4 lbs (24 facilities)</td>
<td>39.3 lbs (24 facilities)</td>
<td>72.2 lbs</td>
</tr>
<tr>
<td>Washington*</td>
<td>13.0 lbs (6 facilities)</td>
<td>11.1 lbs (4 facilities)</td>
<td>8.8 lbs (6 facilities)</td>
<td>27.3 lbs (6 facilities)</td>
<td>61.2 lbs</td>
</tr>
</tbody>
</table>

* Four of the seven WA facilities conducted mobile collections in concert with the central facility.

HHW OPTIONS FOR PEORIA COUNTY

Single Day Events. One option to consider in the long-term HHW strategy is to continue to coordinate single-day collection events with the IEPA on a periodic basis (at least once every two years). The cost to the County for each event is assumed to be approximately $20,000 to co-sponsor plus $4,000 for education and promotion of the events, with an estimated 500 drums collected annually. Assuming annual collection events, the annual cost for single-day events for the County works out to $48 per drum of HHW and $11.80 per participating household (assumes 2038 households using 1.5% participation rate).

The single day events historically collect a relatively small volume of HHW, and, if single-day events continue as the County’s primary source of HHW disposal, the events will predictably have limited capture effectiveness, unless the County decides to hold several single-day events each year. In that case, the County would need to contract with its own HHW contractor, instead of relying upon IEPA’s contractor. Pricing per drum and per household would be significantly higher outside of IEPA’s statewide contract. The following is a list of disadvantages and advantages of single-day events.
Advantages:

✧ COST: there is no need for a storage facility. Offers tight budget control through the ability to limit the number of events. If IEPA sponsored, IEPA assumes disposal cost.

✧ SUSTAINABILITY: Common program with availability of contractors likely to continue. Predictor of participation & material mix for other programs.

✧ SAFETY/LIABILITY: Most liability assumed by contractor. If IEPA sponsored, IEPA assumes generator status.

✧ POLITICAL ACCEPTABILITY: High visibility due to required educational outreach.

✧ PUBLIC SUPPORT: Participation increases as number of events increases.

✧ CONVENIENCE: Frequency can be based on need.

✧ EASE OF IMPLEMENTATION: Limited in duration. Can be turnkey operation by contractor. Easy to permit.

✧ EDUCATIONAL FRIENDLINESS: Good time to educate participants and get press.

✧ FLEXIBILITY: Very flexible – can be set up almost anywhere.

✧ REGULATORY: Very easy to permit.

Disadvantages:

✧ COST: Very high $ to volume ratio. If not IEPA sponsored, cost estimate overruns on events possible from high participation.

✧ EFFICIENCY: Low HHW capture rate. Weather can greatly affect total program performance. High setup charges and special fees. Much advertising required for reasonable participation rates.

✧ SAFETY/LIABILITY: Traffic congestion problems may occur, increasing likelihood of accidents.

✧ POLITICAL ACCEPTABILITY: Can create increased demand for permanent program from public.

✧ PUBLIC SUPPORT: Often perceived as inconvenient system.

✧ CONVENIENCE: Limited days for public use. Can create storage problems for homeowners. Long wait times in lines for uploading. IEPA sponsorship available only once a year or less.

✧ EASE OF IMPLEMENTATION: IEPA has limited budget for events. Contractor may be difficult to schedule.

✧ EDUCATIONAL FRIENDLINESS: Requires more concentrated effort on tight schedule.

Curbside Pickup. The County may consider providing residents with curbside collection either by appointment or on a regular schedule. This is the most convenient and the most expensive option. Jackson County, IL reports costs over $90/household for their by-appointment program with a very small participation rate – approximately 32 households annually out of 24,215 eligible. Several California communities report costs ranging from $97 to $264 per household for their door-to-door HHW collections.
Advantages:

- **COST:** Lower initial capital investment compared to building facilities.
- **EFFICIENCY:** Very high volume per participant. Allows for material rejection without items leaving household (no change of ownership). Captures materials from immobile and homebound population.
- **SUSTAINABILITY:** Can implement as budget allows.
- **PUBLIC SUPPORT:** Most popular with affluent and homebound citizens.
- **CONVENIENCE:** Greatest public convenience of all programs, especially if operated on a continuous basis.
- **EDUCATIONAL FRIENDLINESS:** Materials can be delivered to each home participating.
- **FLEXIBILITY:** Can be implemented as budgets allow.

Disadvantages:

- **COST:** Most expensive $/lb of all program designs.
- **EFFICIENCY:** Does not take advantage of bulk storage of processing. Must transport small shipments immediately after event.
- **SAFETY/LIABILITY:** High liability of materials on the road in program operator’s control, unless liability can be transferred to contractor.
- **EASE OF IMPLEMENTATION:** Very high levels of training if “in-house” personnel used. Complicated contracts if contracted.
- **EDUCATIONAL FRIENDLINESS:** If pickups available only for a limited period of time, custom detailed public education needed for participants on each time period.
- **REGULATORY:** If operated “in-house”, must obtain additional transport permits to deliver to storage, requiring additional staff training and expense.

**Mobile Collections.** These collections are essentially one-day events held in various locations throughout the service area and can be run “in-house” or using a contractor. Standard vehicles are modified with equipment to meet the specific needs of the program and to set up for collection of HHW in different locations in a given area. Typically, mobile events are hosted in areas where materials can be taken back to a permanent facility (such as Lake County, Illinois model) or to a contractor’s facility for proper storage or disposal. No State permits are required for these collections provided the HHW is transported to a permitted facility the same day it is collected.
Advantages:

- **COST**: Lower initial capital investment than building facilities if taken to contractor.
- **EFFICIENCY**: Higher participation rates than single-day events.
- **POLITICAL ACCEPTABILITY**: Brings programs into communities.
- **PUBLIC SUPPORT**: Generally strong.
- **CONVENIENCE**: Can locate close to different population centers. If conducted frequently, more manageable than annual/biennial one day event.
- **EDUCATIONAL FRIENDLINESS**: Can educate communities separately.
- **FLEXIBILITY**: Can control number of collection events. Can be set up almost anywhere to reach a large population.
- **REGULATORY**: Household exemption means no special permits required if HHW is transported the same day as collection.

Disadvantages:

- **COST**: High disposal costs due to smaller quantities delivered to contractor per event and the costs of transportation to the permanent facility. Requires higher level of staff training. If facility is required, combines costs of one-day events with those of permanent facility.
- **EFFICIENCY**: More time and effort for planning. High $/volume captured.
- **SAFETY/LIABILITY**: Higher liability having control of HHW on the road and in temporary collection areas.
- **PUBLIC SUPPORT**: Possible “NIMBY” reaction.
- **EASE OF IMPLEMENTATION**: Higher level of training needed. More custom advertising is required.
- **EDUCATIONAL FRIENDLINESS**: Custom detailed public education needed for participants on each event.
- **SUSTAINABILITY**: Unknown.

**Satellite Collections.** These collections are similar to mobile collections but are held on a regular basis at the same location. Satellite collections are generally associated with a permanent regional collection facility and allow a regional facility to cover a larger geographic area while maintaining good participation rates. Satellite facilities can be run “in-house” or using a contractor. Standard vehicles are modified with equipment to meet the specific needs of the program and to set up for collection of HHW in the selected locations. The equipment can be owned by the hosting community, or provided by a contractor. The collection and transport equipment could be shared among several communities. For example, if four communities have one collection a month on different Saturdays, one equipment set could service all four satellites. Intergovernmental agreements can be used to obtain partial support for the regional facility from satellite communities outside the jurisdiction of the regional facility’s host. No State permits are required for these sites provided the HHW is transported to a permitted facility the same day it is collected.
Advantages:

- COST: Lower initial capital investment than building facilities. Equipment sharing a possibility. Disposal costs are covered if taken to an IEPA sponsored regional facility.
- EFFICIENCY: Higher participation rates than single-day events. Planning is done once for each permanent location.
- POLITICAL ACCEPTABILITY: Brings programs into communities.
- PUBLIC SUPPORT: Generally strong.
- CONVENIENCE: Can locate close to different population centers. If conducted frequently, more manageable than annual/biennial one day event. Convenience of permanent location with regular schedule.
- EDUCATIONAL FRIENDLINESS: Can educate communities separately. The permanent location and regular schedule reduced need to advertise each event.
- FLEXIBILITY: Can be set up almost anywhere to reach large geographic areas.
- REGULATORY: Household exemption means no special permits required if HHW is transported the same day as collection.

Disadvantages:

- COST: Costs of transportation to the permanent facility. Requires higher level of staff training if conducted with in-house personnel.
- SAFETY/LIABILITY: Higher liability having control of HHW on the road and in temporary collection areas.
- PUBLIC SUPPORT: Possible “NIMBY” reaction.
- EASE OF IMPLEMENTATION: Higher level of training needed if conducted with in-house personnel.
- FLEXIBILITY: No storage requires transport the same day. Limited capacity of transport vehicle may require turning people away on days with heavy participation.
- SUSTAINABILITY: Unknown.

Permanent Facilities. The County may decide to establish a permanent collection facility to improve HHW collection within Peoria County. A permanent facility is large enough to perform processing tasks and hold semi-truck load quantities of HHW. It typically has separate areas for: unloading, processing, storage and loading. A stand-alone facility will also contain an office and record keeping. The buildings are usually commercial metal structures with specialized concrete slabs for spill containment and special safety features such as decontamination stations and fire suppression systems. Research to date has demonstrated that permanent HHW facilities collect more HHW than either curbside or single-day events and at a lower total cost per participant (including disposal costs). For example, one-day collections in Illinois have averaged approximately 0.33 pounds per eligible household, while the permanent facilities in Rockford, Naperville and Lake County have averaged about 0.80 pounds per eligible
household – almost 2½ times as much. Several considerations for a permanent HHW facility are discussed below.

**Advantages:**

- **COST:** Economies of scale in packaging and disposal of waste.
- **EFFICIENCY:** Best $ to volume ratio. All collected HHW in one location. Recycle, reuse and swap opportunities. Simplicity of one continuing operation. Ability to share labor.
- **SUSTAINABILITY:** County control over program. Financial support may be shared by numerous entities.
- **SAFETY/LIABILITY:** No transportation liability. All HHW in one well-prepared location.
- **PUBLIC ACCEPTABILITY:** Strong environment/safety improvement. County control over operation. Opportunities for regional cooperation.
- **PUBLIC SUPPORT:** Improved service availability. Improved environment/public safety.
- **CONVENIENCE:** Increased convenience over infrequent one-day events. If IEPA supported, may reduce costs for satellite collections in the surrounding area by providing low-cost or no-cost disposal.
- **EASE OF IMPLEMENTATION:** Only need to do it once.
- **EDUCATIONAL FRIENDLINESS:** Only one program to educate about. No timing problems with getting message out.
- **FLEXIBILITY:** Flexible hours of operation. Choice of materials accepted. Negotiation power with contractors.
- **REGULATORY:** Household exemption minimizes permitting requirements. Host community may waive SB172 siting approval procedures.

**Disadvantages:**

- **COST:** Large initial capital investment. Continuing funding source required for ongoing O&M.
- **EFFICIENCY:** Long term investment recovery.
- **SAFETY/LIABILITY:** Liability of HHW processing and storage.
- **POLITICAL ACCEPTABILITY:** Costs may be hard to justify in smaller counties. Problems accepting materials from out-of-county.
- **PUBLIC SUPPORT:** May be objections from citizens who think facility is too far (for convenience) or too close (NIMBY).
- **CONVENIENCE:** Location dependent. Out-of-the-way facility may reduce participation.
- **EASE OF IMPLEMENTATION:** Involved initial planning, design siting and construction process. Potentially complex intergovernmental contracts. Insurance. If accepting other than HHW, siting and permitting issues.
- **REGULATORY:** Requires a solid waste treatment or storage facility permit.
DESIGN CONSIDERATIONS FOR A PEORIA COUNTY
PERMANENT HHW FACILITY

The design for a HHW permanent facility can be relatively simple to complex, depending upon the overall functions that will occur. Some of the design aspects to consider are:

Sizing and Capacity:
• Service Area
• Function of facility (drop-off access or storage only, office space, “swap shop”)
• Materials to be handled at the facility and their storage requirements
• Available storage space for HHW materials, supplies, and equipment
• Participation rates and daily traffic (Peak vs. Average)
• Peak seasonal loads

Location:
• Convenience to a large number of residents
• Traffic flow in and out of the facility (passenger vehicles, emergency vehicles, and HHW transport vehicles)
• Existing utilities
• Located outside of potential flooding areas
• Jurisdictional waters
• Hydrology and geology
• Archeological and historic sites
• Endangered or threatened species

General Operating Aspects:
• Hours of operation (number of days, hours per day, weekdays or weekends)
• Number of employees (part-time, full-time, volunteer, on-call, off duty) or use of an outside contractor
• In-house operation vs. contractor operation
• Employee training requirements
• Record keeping requirements
Health and Safety Aspects:

- Environmental control systems (water, heating, cooling, ventilation, humidity)
- Security (lighting, fencing, locks)
- State and local permits, building and fire codes
- Materials handling and processing within facility
- Fire suppression, and spill control systems
- Health and safety of potential off-site receptors in the event of fire, spill, or other release

Sizing and Capacity. For the following analysis, Patrick considered a facility designed to provide drop-off access for the public, processing and storage of HHW, and space for a “swap shop” where potentially usable materials may be stored temporarily and offered to the public for reuse either for free or at a low cost.

Service Area. Patrick examined three scenarios for the definition of the service area; Peoria County only, the Peoria-Tazewell-Woodford three-county area, and a larger regional area encompassing satellite communities within a reasonable transport distance. For consistency all demographic data used in this analysis is from the 2000 US census data. The census reported the following numbers of households in the study area:

<table>
<thead>
<tr>
<th>County</th>
<th>Number of Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peoria County</td>
<td>72,733</td>
</tr>
<tr>
<td>Tazewell County</td>
<td>50,327</td>
</tr>
<tr>
<td>Woodford County</td>
<td>12,797</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>135,857</strong></td>
</tr>
</tbody>
</table>

While it might be expected that the larger service area would require a larger facility, studies have shown that the larger the area served, the lower the participation rate. Participation rates drop off significantly as the distance that must be traveled increases. Studies of the distances traveled by those participating in an HHW collection, suggest that the effective service area is roughly a radius of 15 miles\(^2\). Block level census data was used to determine the number of households within selected service areas.

\(^2\) Nightingale, 1997
Using Census tract data, population centroids for the County and the three-county area were plotted. These points represent the shortest total travel distance for all residents and the optimum geographic location for an HHW facility. Due to the large population center represented by the Peoria greater metropolitan area, these two centroids are located only a few miles apart in the City of Peoria (See Figure 4.). Thus, an optimally located facility for one service area would be nearly optimal for the other. A fifteen-mile radius service area was drawn around the two locations and the total number of households within each was tabulated. For the County-only scenario, the area included 119,439 households. For the three-county area, the total was 122,080 households. The capacity requirements for the facility under the alternate scenarios would not vary considerably, unless the facility’s use was limited to County residents.

Figure 4. Population Centroids
While a smaller facility might be possible by limiting access to only Peoria County residences, the intergovernmental agreement, under which the IEPA assumes generator status and the costs of disposal, requires the facility to be open to all Illinois residents. State funding for disposal costs would not be available for a county-only facility. The smaller facility and lower operating costs would be offset by the additional requirement for the County to pay for HHW disposal costs.

A larger facility may be required if it is decided to include satellite collections in the program. In this concept, one-day collections are held periodically in outlying communities (such as one Saturday a month), and the collected HHW is transported the same day to the regional facility. A nearby storage and processing facility allows these one-day collections to be more frequent, smaller and more manageable, and relieves them of most of the HHW disposal costs. Through intergovernmental agreements, a portion of the regional facility’s operating costs could be transferred to the communities conducting the satellite collections. Each community’s share of costs could be based on a number of factors, such as population served, or on the percent of the total HHW processed at the facility that originated in their jurisdiction. Given budget concerns, a satellite system should reduce the overall cost of the host’s operational costs.

The satellite concept is illustrated in Figure 5 where 15-mile radius circles are shown around selected outlying communities. Also shown are tabulations of Census households within each service area.
If all of the satellite areas are included, the service area could contain more than 262,000 households – covering 6000 square miles of land. This number only includes households within the 15-mile radii where participate rates are expected to be significant. The Peoria circle above is centered at the three-county population centroid.

Selection of Materials to be Accepted. Most HHW collection facilities in the country accept similar materials: oil-based paints; mineral spirits and solvents; household cleaning products; gasoline and other automotive fluids; herbicides, insecticides, and other poisons; batteries; fluorescent and HID lamps; and other hazardous items generally found in households.
The permanent facilities currently in operation in Illinois rely on agreements with the IEPA for transportation and disposal of their collected HHW by IEPA contractors. These agreements specify acceptable and unacceptable wastes. The contractors may accept aerosol containers, corrosives, oxidizers, solvents, oil-based paints, inorganic poison solids, organic poisons and pesticides, waste oils, Pentachlorophenol, Silvex, and 2,4,5-Trichlorophenol, household batteries, fluorescent tubes, and other unknown wastes or hazardous substances that are not unacceptable. The unacceptable list includes: ammunition, explosives, radioactive materials, lead-acid batteries, compressed gas containers, and non-special, non-contaminated wastes, including trash and non-hazardous debris. Facilities that accept waste not covered by the IEPA agreement must dispose of those materials at their own expense and liability.

Other materials that are generally not accepted at any HHW collection sites are: asbestos, medical and biological waste (although sometimes sharps are accepted), white goods, and electronics. Smoke detectors contain a small amount of radioactive material; however, the IEPA suggests that this amount is not an exposure hazard and suggests disposing of detectors with normal household wastes.

**Latex paint** is not accepted at some HHW collection sites, primarily because it is not considered a hazardous material, but also because of the large volume of latex paint that is collected. Many solid waste agencies advise residents to dry latex paint and dispose of it with their normal household wastes. Despite instructions to the contrary, in the three single-day collection events in Peoria County between 2003 and 2008, latex paint averaged 8.75% of the waste collected. In Peoria County, there is no county-endorsed location for latex paint disposal.

Collecting latex paint can provide an added one-stop convenience for citizens and increase the facility’s participation rate. In addition, latex and oil-based paints are often still useable and can be recycled through the “swap shop” rather than disposed. Contractors and public agencies will often seek out this “used” paint as a low cost alternative to buying new.

About 25% of the waste collected during the Illinois EPA's one-day HHW collections is paint (both latex and oil-based). To address this large volume item the Agency has initiated the "Partners for Waste Paint Solutions" (PWPS) Program. These partnerships offer consumers the
opportunity to deliver unwanted paint to local participating paint retailers where it will be reformulated or remixed for reuse. Unusable paint is picked up by an Agency contractor for disposal at Agency expense.

**Lead-acid batteries** are not accepted by IEPA because of the extensive infrastructure that exists through retailers to recycle them. However, it may be advantageous to collect lead-acid batteries, as many scrap metal dealers will pay for the batteries thus providing a revenue source.

**Used motor oil**, like lead-acid batteries, has a recycling infrastructure in place with the automotive parts and service retailers. The County could encourage citizens to use retailers to recycle their used oil rather than the HHW facility, to reduce the amount of materials handled at the facility. However, the IEPA contractor will take used oil and the one-stop option may increase participation. Used oil is often mixed with other hazardous substances that will limit its recycling opportunities, so it is important to educate participants not to mix anything in with their used motor oil. With care to avoid contaminated oil, some facilities have found it possible to bulk used oil in a large storage tank and use it to heat the building by using a waste oil heater.

**Business waste**, as discussed earlier, is regulated differently from household waste. If the County wishes to collect waste from non-residential generators of small amounts of hazardous waste (known as "conditionally exempt small quantity generators" or CESQGs), the facility would need to proceed through the Illinois siting process and obtain a RCRA permit. This lengthy and expensive process would increase the County’s burden in establishing a permanent facility. If the County wishes to accept CESQG waste at the facility, a stepped approach is advised: 1) only accept household hazardous waste initially, and, 2) after a period of successful operation, go through the local siting process. If the County wishes to consider this option, it will be important to consider the potential impacts on facility storage, etc. during the facility design stage.

*Projection of HHW Recovered at Peoria County Facility.* In order to develop a preliminary economic evaluation of a permanent HHW facility in the County, Patrick examined
A “participation rate” is calculated as the percent of the households in the service area of the event or facility that bring (or send) HHW in for disposal each year. However, since individual households are not usually tracked, it is more accurately a ratio of the number of vehicles delivering HHW to the facility to the number of households served. The “generation rate” refers to the average weight or volume delivered per household or participant.

<table>
<thead>
<tr>
<th>Source</th>
<th>Range</th>
<th>Median</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peoria County one-day events, 2003, 2005, 2008</td>
<td>0.72% - 1.39%</td>
<td>0.74%</td>
<td>0.95%</td>
</tr>
<tr>
<td>All IEPA one-day events 2004-2008*</td>
<td>0.17% - 39.8%</td>
<td>2.9%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Naperville (2008)</td>
<td>2.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWALCO (2008)</td>
<td>3.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selected** Kansas facilities (6 facilities)</td>
<td>1.6% - 8.7%</td>
<td>3.2%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Selected** Iowa facilities (3 facilities)</td>
<td>1.35% - 5.24%</td>
<td>2.99%</td>
<td>3.12%</td>
</tr>
<tr>
<td>Selected** California facilities (24 facilities)</td>
<td>1.0% - 27.7%</td>
<td>6.7%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Selected ** Washington Facilities (6 facilities)</td>
<td>2.91% - 17.48%***</td>
<td>9.03%</td>
<td>11.67%</td>
</tr>
</tbody>
</table>

*Excludes seven City of Chicago events with less than 0.1% participation
**Facilities serving communities of 50,000 to 250,000 households
***Includes participation in satellite collections conducted by 4 of the 6 facilities.

It can be seen that participation rates can vary widely. They are typically very sensitive to the amount of public education and promotion, the location, and, in the case of one-day events, the weather. Much of the scatter seen is also due to varying definitions of the service area. Figure 6 graphs the participating households vs. the total service area households for 48 facilities. Although a good correlation is not expected with so much scatter in the data, the trend line indicates an overall average participation rate of about 7.4%.
Reports of participation rates above 15% are rare, and the one report of participation over 39% was based on only the number of households in Sandwich, IL, while the event drew significant participants from surrounding communities.

For permanent facilities, participation rates can also vary seasonally. The Naperville facility reports that traffic in the late spring and early summer is twice the annual average. One Iowa facility reports that during April and May they receive half their total annual collections. Sizing of facilities must take into consideration these monthly peaks. Figure 7 and Table 8 illustrate the seasonal variation in collections at the four Illinois facilities.
TABLE 8. PEAK VS AVERAGE MONTHLY COLLECTIONS

<table>
<thead>
<tr>
<th></th>
<th>Chicago</th>
<th>Naperville</th>
<th>SWALCO</th>
<th>Rockford</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average monthly collection (drums)</td>
<td>83.4</td>
<td>105.0</td>
<td>143.2</td>
<td>94.0</td>
</tr>
<tr>
<td>Average peak month collection (drums)</td>
<td>185.2</td>
<td>161.9</td>
<td>261.9</td>
<td>138.1</td>
</tr>
<tr>
<td>Peak month / Average month</td>
<td>2.2</td>
<td>1.5</td>
<td>1.8</td>
<td>1.5</td>
</tr>
</tbody>
</table>

The lower volumes seen in the winter suggest that staffing might be reduced, operational schedules could be cut back, or the facility could be closed during these months. These differences are also important in facility design to enable it to handle peak traffic flows. For the purposes of this analysis, Patrick has chosen to assume that the peak month traffic is twice the monthly average.

Generation rates for HHW were discussed earlier in this document. Table 9 is a summary of selected data examined by Patrick.
TABLE 9. GENERATION RATE DATA (SUMMARY)

<table>
<thead>
<tr>
<th>Source</th>
<th>Range</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peoria County one-day events, 2003, 2005, 2008</td>
<td>0.20-0.27 drums/HH</td>
<td>0.23 drums/HH (est. 34.5 lbs)</td>
</tr>
<tr>
<td>All IEPA one-day events 2004-2008</td>
<td>0.09 – 0.49 drums/HH</td>
<td>0.19 drums/HH (est. 28.5 lbs)</td>
</tr>
<tr>
<td>Illinois permanent HHW facilities (4 facilities)</td>
<td>0.08 – 0.27 drums/HH</td>
<td>0.15 drums/HH (est. 22.5 lbs)</td>
</tr>
<tr>
<td>Selected* Kansas facilities (6 facilities)</td>
<td>36.6 – 127 lbs/HH</td>
<td>84 lbs/HH</td>
</tr>
<tr>
<td>Selected* Iowa facilities (3 facilities)</td>
<td>68.2 – 124 lbs/HH</td>
<td>115 lbs/HH</td>
</tr>
<tr>
<td>Selected* California facilities (24 facilities)</td>
<td>26.3 – 165 lbs/HH</td>
<td>70.2 lbs/HH</td>
</tr>
<tr>
<td>Selected* Washington facilities (6 facilities)</td>
<td>29.3-132 lbs/HH</td>
<td>69.8 lbs/HH</td>
</tr>
<tr>
<td>Trend line analysis of 39 selected* facilities</td>
<td>n/a</td>
<td>65.2 lbs/HH</td>
</tr>
</tbody>
</table>

* Facilities serving communities of 50,000 to 250,000 households

The generation rates can vary as widely as the participation rates but are strongly related to the types of materials that are accepted at the facility. Facilities accepting only HHW such as that on IEPA’s acceptable list, and discouraging acceptance of latex paint, used oil and lead-acid (automobile) batteries, average generation rates are around 30-40 pounds per household. Facilities that accept and encourage the collection of these additional items can see generation rates approaching and sometimes surpassing 100 pounds per household.

HHW in containers and packed in drums with a packing material such as vermiculite (called a lab-pack) can weigh 150-200 lbs/drum on average. However, some liquid wastes, specifically paint, oil and some flammables, can be poured directly into drums to save storage space. This process is known as “bulking”. Bulked paint at 12 lbs/gal can weigh 660 lbs/drum. Bulk oil at 8 lbs/gal can weigh 440 lbs/drum. Used oil can also be bulked in storage tanks larger than 55 gallon barrels.
Regional Facility: Since the proposed Peoria County HHW facility would be the only facility in central Illinois, and the agreements with IEPA specify that permanent facilities must be open to all Illinois citizens, the facility will likely draw participants from other counties. Figure 8 illustrates the required storage capacity for a HHW facility in Peoria County based on the following assumptions: The facility service area includes approximately 125,000 households in the three-county area, an average weight of 150 pounds per drum, and sufficient storage for 2 months’ average collection (also equivalent to 1 peak month’s collection).

![Figure 8. Peoria Regional HHW Facility Required Storage Capacity](image)

Peoria County encourages the collection of latex paint, used oil and lead-acid batteries because this encourages participation and will likely increase the capture of other forms of HHW. If that were the case, the chart indicates that, at a 5% participation rate and assuming 65 pounds per participant, the required storage capacity for one peak month would be approximately 451 drums. Eighty drums correspond to one full semi-trailer load.

If a satellite system is established to potentially serve 262,000 households, the needed storage capacity could increase, although more frequent shipments can control space issues. As
a comparison, at a 3% participation rate SWALCO manages storage for 216,000 county households in under 4000 square feet of space.

**County-only:** Figure 9 below repeats the required storage calculation in the previous chart with the assumption of a Peoria County only facility serving 75,000 households.

At an estimated 65 pounds per participant and a 5% participation rate, the required storage capacity becomes 271 drums for one peak month.

Should the County wish to pursue the collection of CESQG waste at some future date; the facility design should include sufficient capacity or expandability to include the increased volumes from this source. A Washington State study estimated that the average small business generates 1,400 pounds of hazardous waste per year (119 pounds per month). The Census Bureau identified 4,867 non-farm employers and 8,953 non-employer establishments in Peoria County. A large majority of these establishments are likely to qualify as CESQGs. If only five percent of these establishments were to use the Peoria County facility to dispose of their
hazardous waste, the facility could require an additional 822 drums of storage capacity for one peak month.

The above calculations should give a generous estimate of the required storage capacity. “Swap shop” activities will reduce the amount of storage volume required, but increase the space needed to display the “goods” for exchange. Bulking and more frequent pickups by the disposal contractor can also reduce storage requirements. It is instructional however to note that, in a nationwide survey of HHW facilities that had been operating six years or longer, only one facility operator thought that their facility had been designed with sufficient storage capacity.\(^3\)

**Location.** Choosing a location for the facility will naturally depend on a large number of factors. The optimum location will be near the center of population of the County for maximum convenience to the largest number of residents, located along a major commuting route for shopping or work, with unrestricted traffic flow in and out of the facility for passenger vehicles, emergency vehicles, and HHW transport vehicles. The site will require access to electricity, sewer and water, and telephone utilities at a minimum. Also, the facility should be served by a local fire department that has the training and equipment necessary to respond to the facility.

Permitting the facility will also require addressing the following siting issues:

- **Floodplain limits.** No portion of the facility should be located within the 100-year floodplain.
- **Jurisdictional waters.** Filling within jurisdictional wetlands or waters of the United States requires prior authorization from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act.
- **Archeological and historic sites.** The Illinois Historical Preservation Agency (IHPA) must be contacted to determine if any significant historic, architectural or archeological resources are located within the proposed project area.
- **Endangered or threatened species.** The Illinois Department of Natural Resources (IDNR) must be contacted to determine if any threatened or endangered species are present on or near the proposed facility.

\(^3\) Nightingale, 1997
• **Topography.** The ideal site will be generally flat but will have adequate slope for drainage and control of stormwater runoff.

• **Residential setback.** There are no specific setback requirements for such a facility in Illinois.

• **Site history.** Any site with a possibility of prior environmental contamination should be examined to establish a baseline before facility construction and operation. Soil and groundwater samples will help establish the source of any future contamination that may be found.

**General Operating Aspects.** The cost of operation of a HHW collection facility over its lifetime will typically surpass the initial cost of the facility. Operational procedures will have a significant impact on the overall cost of operation.

**Operating Hours and Staffing Requirements.** Few HHW collection facilities are open every day or even during normal business hours. Weekend operation is a common practice as it provides convenient access for most homeowners. The four facilities currently operating in Illinois are open only on weekends. However, the number of hours of operation must be balanced against the expected participation in order to keep the staffing required at a reasonable level. Fewer hours of operation will result in higher traffic flows, which in turn will require more staff on site. A minimum of two staff is recommended during operational hours in case of accidents or other emergencies.

A staffing analysis done by the Naperville HHW facility found that the number of cars serviced by each employee per day varied from 23 to 50 with an average of 35 on Saturdays and from 11 to 23 with an average of 18 on Sundays. The facility is open for six hours every Saturday and Sunday from 9 a.m. to 3 p.m. excluding holidays. It services an average 13,170 cars per year with four to six staff. Staffing is usually higher during summer months due to increased traffic.

Table 10 analyzes two scenarios for operating a HHW collection facility for Peoria County. The number of visitors is based on a 5% participation rate within the service area. The recommended number of staff includes one employee to oversee swap shop operations as well as
assisting in collection and processing activities. Staffing and/or hours might be reduced during winter months.

<table>
<thead>
<tr>
<th>TABLE 10. STAFFING ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peoria County HHW Facility</strong></td>
</tr>
<tr>
<td><strong>(County only)</strong></td>
</tr>
<tr>
<td>Estimated # of participants (cars) annually</td>
</tr>
<tr>
<td>Days open per month</td>
</tr>
<tr>
<td>Average # of cars per day</td>
</tr>
<tr>
<td>Peak* # cars per day</td>
</tr>
<tr>
<td>Recommended # of staff</td>
</tr>
<tr>
<td>Peak* # cars per employee per day</td>
</tr>
</tbody>
</table>

* “Peak” assumes twice the average rate.

Labor costs are a significant factor in the overall operating cost for a facility. Generally, labor is provided by (a) environmental contractor employees, (b) County employees with hazard training, (c) other public sector employees with hazard training (such as firefighters), or (d) a combination of the above. The lowest-cost option might be employing on-duty firefighters that are not engaged in firefighting activities; however, it is unclear how the facility would be staffed in the event of a fire and if such a facility could be conveniently located at or near a fire station. If an outside contractor or firefighters were used, they would need to be supervised by a trained County employee.

**In-House Operation vs. Contractor Operation.** A report commissioned by Portland, Oregon\(^4\) explored the pros and cons of in-house (county-managed) versus contractor-operated programs. The survey asked respondents to provide their opinions on the benefits and drawbacks of the two major program types. Not surprisingly, most comments favored the type of program that the respondent’s jurisdiction provides – that is, in-house operators preferred in-house programs and vice versa. Some advantages, such as reduced costs and improved flexibility, were reported for both types of programs.

\(^4\) Cascadia(2005)
Benefits of In-house HHW Programs:

- Better customer service, including more direct personal contact with the public and greater consistency than with changing contractors;
- Cost-effectiveness: lower costs, longer hours, better cost control, and greater participation;
- Better control of costs and day-to-day operations;
- Increased flexibility that can provide streamlined operations and reduced overhead;
- Better suited for staffing permanent facilities, which may provide better service than events; can shift staffing from transfer stations and other facilities;
- Employ local citizens, provide benefits to workers, and spend taxpayer dollars locally;
- Better staff training;
- Incentives for waste reduction, recycling, reuse, and other waste prevention;
- Focused on the public interest, not a profit motive, and thus may select the best method for waste management, even when it is not the lowest cost option; and
- Better integration with other public and community services.

Reported Benefits of Contractor-operated HHW Programs:

- Access to broader expertise and resources beyond local government employees, including greater knowledge of current HHW regulations;
- Can be less expensive, including ability to reduce costs through competition among contractors and typically lower upfront capital costs;
- Fewer issues with labor, including unions, and the contractor handles all staffing and labor issues;
- Faster implementation of programs and increased flexibility, including seasonal operations and occasional events;
- Less political influence on operations and less administration (bureaucracy);
- Less administrative burden and management workload for public agencies;
• Reduced liability; and
• May have improved data tracking and reporting capabilities.

Staff Training. A personnel training plan should be provided that describes training appropriate to the job duties of each employee. Training should address waste identification, proper waste handling procedures, how to recognize unauthorized waste, how to safely operate equipment, and proper container and tank management procedures. All personnel should have emergency response training so they can respond effectively in an emergency. This should include procedures to be followed to handle an emergency situation, how and when to contact emergency response personnel and the location, type and use of emergency response equipment.

Suggested training:

• Applicable environmental regulatory awareness training
• Emergency response training
• Blood borne pathogen training (facility specific, important if sharps are accepted)
• 40-hour OSHA hazardous materials and incident management training with annual 8-hour refreshers (highly recommended for supervisory personnel)
• US Department of Transportation Training and certification
• CPR and first aid
• Hazcat or other field chemistry compatibility training
• Forklift training (facility specific)

The IEPA agreement with permanent collection facilities requires its disposal contractor to provide training for the facility’s on-site collection staff in the proper method of operating a HHW collection station and in all aspects of receiving, identifying, segregating and packing the wastes in a proper and safe manner.

The IEPA agreement requires the disposal contractor’s training to consist of a minimum two-day course of no less than fifteen hours including:

• Federal and state legal requirements applicable to HHW handling;
• The methods of collecting HHW from the public and identifying unknown materials;
• Bulking procedures, the use of different types of containers, record keeping, storage procedures, fire safety, and emergency precautions and procedures;
• Procedures for waste shipment, including packaging, labeling and manifest preparation;
• Procedures for long-term record keeping, including wastes received, manifests, and disposal information;
• The development of an emergency plan addressing first aid in the event of a release, spill, or clean-up and police and fire protection; and
• Field practice in waste segregation, bulking, packaging, and record keeping.

This basic training could be supplemented as needed with other training as suggested above.

One option that would reduce the County’s training burden and potential liability up-front would be to hire an environmental contractor to operate the facility for an initial period (one to two years). Then, if the County decides to operate it with County employees or enter into agreements with other local government agencies, the County would be able to draw from their operational experience of the first year or two. Alternatively, the County could continue to work with the contractor if it remains the most feasible option.

Health and Safety Aspects. The facility design must include features that inherently provide protection of the health and safety of the employees, participants and neighbors.

• At a minimum the building should be heated to prevent freezing of water supplies and stored materials, and ventilated to prevent any build-up of vapors or fumes. The office and swap shop areas may be air conditioned during occupancy periods. Monitoring for hazardous gases and volatile chemicals in the air is recommended.
• The facility should be provided with exterior lighting and fenced and secured against intrusion during unoccupied periods.
• The facility should be designed to adhere to all applicable National Fire Protection Association (NFPA), state and local codes including fire protection. This will likely include sprinklers or other fire suppression systems, explosion proof electrical systems, and fire-rated interior walls.

• Spill control will be enhanced by properly sloped floors and berms in the storage areas for secondary containment and providing spill decks or pallets under worktables and bulking areas. Floor drains should be a triple basin design with a valved outlet.

• All HHW storage will be either in the building or specially designed hazmat storage containers, and labeled and separated by type of hazard.

Spill Plans, Fire Control, Emergency Response. The facility shall have plans in place in the event of a spill, fire, or other emergency at the facility. These plans may be implemented as part of an overall emergency response plan for the facility, or may be separate plans.

PRELIMINARY ECONOMIC ANALYSIS OF PERMANENT FACILITIES

Patrick utilized economic data obtained from several HHW collection programs throughout the country as well as data from the IEPA HHW program in order to develop a conceptual design for a HHW collection facility for Peoria County.

Probable General Layout of Facility. The following design criteria were used in the development of the layout and cost estimate. Note, the cost estimate and layout are not based on an identified site or detailed facility design. The following design components are recommended:

• Resident drop-off
• Double-lane for peak traffic queuing and bypass lane in case of stalled vehicle
• Adequate storage for one peak month collection
• No outside storage of drummed material
• Possibly bulking of selected materials
• Commercial steel or block/concrete building, insulated, fire-rated interior walls
• Sealed concrete slab at grade over a liner
• Utilities are located at property boundary
• Office and swap shop areas
• Lavatories for both sexes
• Heated building, mechanical ventilation, office and swap shop air conditioned
• Adherence to NFPA, state and local codes including fire suppression system
• Parking for all staff and at least four visitors at one time
• Seven foot chain link fence surrounding perimeter of the building
• Outdoor lighting
• Covered unloading and loading areas
• Ramp to loading dock
• Flammable and high hazard storage in detached hazmat storage containers

The facility would operate as follows. Incoming vehicles stop under the covered unloading area to drop material at one of two overhead doors. Approximately four vehicles could access the doors at any one time. The attendants approach the driver to obtain survey information, signatures, etc., as necessary, and then proceed to unload the vehicle. The material is logged and moved to a designated holding/sorting area. Upon delivery of the material, the cars exit the site or drive to the side of the building and park to visit the swap shop.

The building is developed for the scenarios expected and is approximately 5400 square feet. The building is a pre-engineered, commercial steel building, clear span, with insulation and fire-rated internal walls. The building’s floor is a sealed, custom concrete slab at the same elevation as the car queuing area. The interior space is divided between a receiving/processing area, a storage area, an office and a swap shop.

The receiving/staging/processing area is accessed from the two overhead doors at the receiving area and one overhead door at the loading area. Materials are accepted from the participants and temporarily stored in the staging area. Tables are strategically located for sorting materials and recording information. A laboratory is provided for material testing and testing apparatus storage. Upon identification and destination determination, the items are either
bulked or lab packed in the processing area.

Flammables and other high hazard materials such as mercury would be removed from the main building to a hazmat storage structure/container opposite the loading area. This prefabricated unit would be designed for bulking and storage of flammables with an integrated dry chemical fire suppression system, explosion proof electrical fixtures and heating system, active ventilation system and integrated explosion relief panels. It may also be divided in two or three compartments. Removing the bulking and storage of flammables from the main building may eliminate the need for and high cost of explosion proof electrical systems in the main building. Two hazmat storage units are shown with a maximum storage capacity of approximately 40 drums each, but space could be allowed for additional hazmat storage units should it be required.

Upon receipt, storage and bulking, the materials are moved through an overhead door into the main storage room. The two rooms are separated by a fire-rated concrete block wall. The floor is epoxy coated. Separate storage bins are provided to separate stored materials by hazard type. Floors and walls are constructed so as to provide separate secondary containment for each bin in the event of a spill. Allowing sufficient passageways, the storage area could potentially hold 280 drums or more without stacking. Stacking of full drums is not recommended, however stacking of empty drums awaiting packing is allowable, depending on the equipment available to move the drums.

The office and swap shop are separated from the other areas by a fire-rated wall. Access to the office and swap shop is from separate public entrances and an interior door. Located at the front corner of the building adjacent to the receiving area, the attendant can observe traffic into and out of the facility. This room is fully heated and cooled. Lavatories are provided for both sexes.

A ramp is provided to facilitate loading of trailers from the storage area. The loading area is covered. Facility layout and site diagrams are provided in Figures 10 and 11 on the following pages.
**Estimated Facility Capital Costs.** The following is a preliminary estimate of the capital costs to construct the facility described above. These costs are based on judgment and historical costs, and not on actual quotes, an identified site or detailed facility design.

<table>
<thead>
<tr>
<th>TABLE 11. ESTIMATED FACILITY CAPITAL COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
</tr>
<tr>
<td>Capital Costs</td>
</tr>
<tr>
<td>Land Acquisition</td>
</tr>
<tr>
<td>Building Cost (building, electric, heating, cooling)</td>
</tr>
<tr>
<td>Storage Containers</td>
</tr>
<tr>
<td>Site Work (grading, ponds, asphalt, cement, rock, excavation, utilities, etc.)</td>
</tr>
<tr>
<td>Engineering/Architecture</td>
</tr>
<tr>
<td>Engineering/Architecture Design</td>
</tr>
<tr>
<td>Pre-purchase investigation and Permitting (legal not included)</td>
</tr>
<tr>
<td>Equipment Costs</td>
</tr>
<tr>
<td>Forklift, Scale, Computer system, Can crusher, etc.</td>
</tr>
<tr>
<td>Capital Costs Subtotal</td>
</tr>
</tbody>
</table>

Construction costs for the facility could be reduced if located at or near an existing facility underutilized during HHW facility operating times or if an existing, unused building with site infrastructure is available and is amenable to retrofitting.

**Estimated Facility Operating Costs.** To estimate approximate annual operating costs for a Peoria County HHW facility, Patrick examined operating cost data available from 21 facilities in Iowa, Kansas, California and Washington serving similar sized communities. Table 12 summarizes this data based on the operating costs per participant.
<table>
<thead>
<tr>
<th>Source</th>
<th>Range</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naperville</td>
<td>~$14.36 /HH</td>
<td></td>
</tr>
<tr>
<td>SWALCO</td>
<td>$33.00 /HH</td>
<td></td>
</tr>
<tr>
<td>Selected* Kansas facilities (6 facilities)</td>
<td>$5.80 - $26.23 /HH</td>
<td>$17.25 /HH</td>
</tr>
<tr>
<td>Selected* Iowa facilities (3 facilities)</td>
<td>$12.36 - $24.98 /HH</td>
<td>$16.20 /HH</td>
</tr>
<tr>
<td>Selected* California facilities (9 facilities)</td>
<td>$5.36 – $82.49/HH</td>
<td>$33.18/HH</td>
</tr>
<tr>
<td>Selected* Washington facilities (3 facilities)</td>
<td>$15.30 - $59.60 /HH</td>
<td>$25.81/HH</td>
</tr>
</tbody>
</table>

**Median of above facilities:** $24.98 /HH

*A Facilities serving communities of 50,000 to 250,000 households

A trend line was fit to the operating cost data from these facilities to predict approximate costs for Peoria County. While not all cost accounting procedures were identical, in all cases, the operating costs excluded disposal costs, as would be the case under an agreement with IEPA. The results of these calculations are graphed on Figure 12.

![Figure 12. Annual Operating Costs for Selected HHW Collection Facilities](image)

The large boxes in the figures illustrate three scenarios for the Peoria County facility; a county-only facility servicing 75,000 households, a regional facility servicing 125,000 households, and a regional facility servicing 150,000 households.
households, and a regional facility with 8 satellites servicing 262,000 households – assuming a 5% participation rate in their service areas and 65 pounds per household. The trend line predicts an average operating cost of approximately $37,000 a year in fixed costs plus $0.222/pound in variable costs.

The tables below show how Patrick anticipates these costs would break down for these three scenarios:

<table>
<thead>
<tr>
<th>TABLE 13. PEORIA COUNTY HHW FACILITY ANNUAL COSTS (PEORIA ONLY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building and Equipment Annual</td>
</tr>
<tr>
<td>Operation and Maintenance</td>
</tr>
<tr>
<td>Estimated</td>
</tr>
<tr>
<td>Labor</td>
</tr>
<tr>
<td>months/yr</td>
</tr>
<tr>
<td>HHW technician/specialist/supervisor 12</td>
</tr>
<tr>
<td>Equipment Operator/Maintenance 12</td>
</tr>
<tr>
<td>Lab Packer/attendant/assistant 12</td>
</tr>
<tr>
<td>Administration/support 12</td>
</tr>
<tr>
<td>Subtotal of Labor</td>
</tr>
<tr>
<td>Operating supplies and</td>
</tr>
<tr>
<td>Commodities</td>
</tr>
<tr>
<td>Estimated</td>
</tr>
<tr>
<td>Annual Utilities</td>
</tr>
<tr>
<td>Estimated</td>
</tr>
<tr>
<td>Education and Promotion</td>
</tr>
<tr>
<td>Estimated</td>
</tr>
<tr>
<td>Insurance Costs</td>
</tr>
<tr>
<td>Estimated</td>
</tr>
<tr>
<td>Total Annual Costs</td>
</tr>
<tr>
<td>Operating Overhead (0%)</td>
</tr>
<tr>
<td>Profit (0%)</td>
</tr>
<tr>
<td>Total Annual Costs (Incl. O.&amp; P.)</td>
</tr>
<tr>
<td>Building, Engineering, Site, Equipment Costs Annualized at 4.5%, 20 years</td>
</tr>
<tr>
<td>Total Annual Costs (Incl. Amortization)</td>
</tr>
</tbody>
</table>
### TABLE 14. PEORIA REGIONAL HHW FACILITY ANNUAL COSTS (3-COUNTY AREA)

<table>
<thead>
<tr>
<th></th>
<th>Estimated</th>
<th>1</th>
<th>$20,000</th>
<th>$20,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building and Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Operation and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor</td>
<td>months/yr</td>
<td>Hrs/month</td>
<td>employees</td>
<td></td>
</tr>
<tr>
<td>HHW technician/specialist/supervisor</td>
<td>12</td>
<td>80</td>
<td>1</td>
<td>$24</td>
</tr>
<tr>
<td>Equipment Operator/</td>
<td>12</td>
<td>80</td>
<td>1</td>
<td>$18</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lab Packer/attendant/</td>
<td>12</td>
<td>80</td>
<td>4</td>
<td>$15</td>
</tr>
<tr>
<td>assistant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration/support</td>
<td>12</td>
<td>80</td>
<td>1</td>
<td>$18</td>
</tr>
<tr>
<td>Subtotal of Labor</td>
<td></td>
<td></td>
<td></td>
<td>$115,200</td>
</tr>
<tr>
<td>Operating supplies and</td>
<td>Estimated</td>
<td>1</td>
<td>$12,000</td>
<td>$12,000</td>
</tr>
<tr>
<td>Commodities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Utilities</td>
<td>Estimated</td>
<td>1</td>
<td>$8,000</td>
<td>$8,000</td>
</tr>
<tr>
<td>Education and Promotion</td>
<td>Estimated</td>
<td>1</td>
<td>$3,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>Insurance Costs</td>
<td>Estimated</td>
<td>1</td>
<td>$26,000</td>
<td>$26,000</td>
</tr>
<tr>
<td>Total Annual Costs</td>
<td></td>
<td></td>
<td>$184,200</td>
<td></td>
</tr>
<tr>
<td>Operating Overhead (0%)</td>
<td></td>
<td></td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Profit (0%)</td>
<td></td>
<td></td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Total Annual Costs (Incl. O.&amp; P.)</td>
<td></td>
<td></td>
<td>$184,200</td>
<td></td>
</tr>
<tr>
<td>Building, Engineering,</td>
<td></td>
<td></td>
<td>$1,144,000</td>
<td>$87,946</td>
</tr>
<tr>
<td>Site, Equipment Costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annualized at 4.5%, 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Annual Costs (Incl. Amortization)</td>
<td></td>
<td></td>
<td>$272,146</td>
<td></td>
</tr>
</tbody>
</table>
## TABLE 15. PEORIA REGIONAL HHW FACILITY ANNUAL COSTS WITH SATELLITE OPERATIONS

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimated</th>
<th>Lbs</th>
<th>$0.30</th>
<th>($133,575)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Share income from Satellite Communities*</td>
<td></td>
<td>44525</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Overhead (0%)</td>
<td></td>
<td></td>
<td></td>
<td>$0</td>
</tr>
<tr>
<td>Profit (0%)</td>
<td></td>
<td></td>
<td></td>
<td>$0</td>
</tr>
<tr>
<td><strong>Total Annual Costs (Incl. O. &amp; P.)</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$173,889</strong></td>
</tr>
<tr>
<td>Building, Engineering, Site, Equipment Costs</td>
<td></td>
<td></td>
<td></td>
<td>$1,144,000</td>
</tr>
<tr>
<td>Annualized at 4.5%, 20 years</td>
<td></td>
<td></td>
<td></td>
<td>$87,946</td>
</tr>
<tr>
<td><strong>Total Annual Costs (Incl. Amortization)</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$261,835</strong></td>
</tr>
</tbody>
</table>

* Assumes $0.30/lb of HHW received from satellite communities for operating cost sharing.
** Does not include costs to operate satellite and transport to regional facility.

The above analysis assumes that the County will operate the facility. Should the County opt to hire an environmental contractor to operate the facility, some of these costs would be incorporated into that contract and an allowance included for the operating overhead and profit for the contractor. It is anticipated that contractor overhead and profit would increase the overall operating costs of the facility.
Insurance costs are estimated to include only special environmental liability coverage. No allowance is made for general liability coverage or personal liability coverage for public officials as these are typically self-insured by the owning municipality. It is also possible for the County to opt to self-insure for environmental liability.

Operating costs can be controlled to some extent by seasonally adjusting staff levels and operating hours.

Should the facility enter into an agreement with IEPA, the IEPA will assume the transportation and disposal costs for the collected HHW up to a negotiated limit if funding is available. However, IEPA also requires that the facility accept HHW from any Illinois citizen, making it a de facto regional facility. Forgoing an agreement with IEPA would enable the County to turn-away or charge out-of-county residents, but the disposal costs for the HHW would far exceed the added operating costs of accepting out-of-county waste. Recent costs incurred by the IEPA for disposal from the four existing facilities have averaged $168.93 a drum ($1.13/lb for a 150 lb drum). This amounts to projected disposal fees of $459,000 and $275,000 annually for the Regional and County-only scenarios, respectively.

Funding permitting, the IEPA is willing to consider a three-year contract for a start-up facility allowing the County to accept only from Peoria County for the first year. This would give the County time to gain experience in operating the facility, measuring demand for its services from out-of-county, and negotiating agreements with neighboring communities. The actual facility’s presence will encourage participation of satellite operations and agreements.

**Estimated Program Effectiveness.**

**Comparison of Collection Options.**

Table 16 shows that a regional permanent facility, while more expensive per household served than the current practice of annual one-day events, is far more cost effective at capturing HHW and diverting it from improper disposal.
### TABLE 16. COLLECTION OPTIONS

<table>
<thead>
<tr>
<th>Collection type</th>
<th>Participation rate</th>
<th>Lbs/participant</th>
<th># of Participants</th>
<th>Total Lbs of HHW Collected</th>
<th>Annual Cost*</th>
<th>Cost*/lb</th>
<th>Cost*/participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-day event</td>
<td>0.95%</td>
<td>35</td>
<td>1290</td>
<td>45,120</td>
<td>$10,000</td>
<td>$0.222</td>
<td>$7.75</td>
</tr>
<tr>
<td>Permanent Facility (County)</td>
<td>5.0%</td>
<td>65</td>
<td>3750</td>
<td>243,750</td>
<td>$129,920</td>
<td>$0.53</td>
<td>$34.65</td>
</tr>
<tr>
<td>Permanent Facility (County) Including amortized facility cost</td>
<td>5.0%</td>
<td>65</td>
<td>3750</td>
<td>243,750</td>
<td>$185,425</td>
<td>$0.76</td>
<td>$49.45</td>
</tr>
<tr>
<td>Permanent Facility (Regional)</td>
<td>5.0%</td>
<td>65</td>
<td>6250</td>
<td>406,250</td>
<td>$184,200</td>
<td>$0.45</td>
<td>$29.47</td>
</tr>
<tr>
<td>Permanent Facility (Regional) Including amortized facility cost</td>
<td>5.0%</td>
<td>65</td>
<td>6250</td>
<td>406,250</td>
<td>$272,146</td>
<td>$0.67</td>
<td>$43.54</td>
</tr>
<tr>
<td>Permanent Facility (Satellite)** 262,000 Households</td>
<td>5.0%</td>
<td>65</td>
<td>13,100</td>
<td>851,500</td>
<td>$173,889</td>
<td>$0.20</td>
<td>$13.27</td>
</tr>
<tr>
<td>Permanent Facility (Satellite)** Including amortized facility cost</td>
<td>5.0%</td>
<td>65</td>
<td>13,100</td>
<td>851,500</td>
<td>$261,835</td>
<td>$0.31</td>
<td>$19.99</td>
</tr>
</tbody>
</table>

* Excludes disposal costs  
** Does not include costs to operate satellite site and transport HHW to regional facility. Includes income from cost sharing by satellite communities

**Potential Funding Sources.** A potential funding source for building and operating a HHW facility in Illinois are landfill tipping fee surcharges and landfill host fees earmarked for HHW management. By state law the County may collect a $1.27/ton landfill tipping fee surcharge at landfills in its jurisdiction. This money is restricted in use and the County can only spend it on solid waste management programs. Annual tipping fee surcharge revenues for the City/County are approximately $385,000, and the local landfill is expected to be open at least another 10 years or more. These funds could be used to acquire property, and design, construct and equip a HHW facility.

Grant opportunities exist under the American Recovery and Reinvestment Act of 2009 that can support the construct of HHW facilities. For example, the city of Peoria is eligible for a direct formula award under the Energy Efficiency and Conservation Block Grant Program which
allows funds to be used for HHW management. The County is eligible for a sub-grant from the State under that same program.

If an agreement with IEPA were signed, the IEPA would provide a contractor to pick up the HHW from the facility and pay for disposal. If items outside IEPA’s contract would be accepted, disposal costs for those items would have to be borne by the County. It is uncertain at this time, however, whether future State budgets will allow the expansion of this program to additional facilities.

The County should also seek cooperative funding from communities inside and outside the County that would also be served by the facility. A facility located in or near the city of Peoria would put large portions of Tazewell and Woodford counties within its service area, along with most of the major municipalities in the three-county area.

It is anticipated that through a combination of landfill tipping fee surcharges, grants, cooperative funding, and IEPA disposal assistance, all costs to build and operate a HHW facility in Peoria County could be covered, although a loan may be necessary to finance construction. If the County elects to accept CESQG waste, then it is recommended to charge a fee for CESQG waste.

Private ownership and operation of the HHW facility is also a potential option. In recent negotiations for a landfill expansion in Peoria County, the landfill operator offered to establish an HHW facility at the landfill that would handle up to 150,000 pounds a year. At typical generation rates between 30 and 60 pounds/year/household, the proposed capacity of 150,000 pounds per year would allow a participation rate between 2% and 4%. Under such an agreement, the costs to build and operate the facility would be built into the gate fees for disposal of MSW at the landfill.

**Implementation Steps.** If the County elects to proceed with the implementation of a permanent facility, the following general actions will need to be pursued:

- Identifying the specific wastes to be accepted and operating characteristics
• Selection of an appropriate site
• Waive the siting procedure
• Develop a detailed facility design
• Application to IEPA for development/construction permit
• Negotiation with IEPA for disposal agreement
• Bid construction project
• Construct and equip facility
• Application for operating permit
• Selection and training of personnel
• Launch education/promotion program
• Open doors

CONCLUSIONS AND RECOMMENDATIONS

The results of the study indicate that a permanent regional HHW collection facility located in Peoria County is a feasible and effective option to economically maximize the collection of HHW and divert it from improper disposal. While a more expensive option than continuing the bi-annual one-day collection events, a permanent facility promises greater convenience to the public, higher participation rates, much improved capture of HHW, and improved health and environmental safety for Peoria County residents.

Based on the analyses performed and conclusion, it is recommended that Peoria County proceed with the development of a permanent HHW collection facility.

Ref: P:\Peoria County\20903.013 - HHW\Peoria - Co HHW feasibility study Final DRAFT.doc
Appendix A

HAZARDOUS CHEMICALS IN HOUSEHOLD PRODUCTS

**Acids**
Acetic Acid
Chromic Acid
Tannic Acid (Caustic)

**Adhesives and Glues**
Isopropanol (Ignitable)
Methyl Ethyl Ketone (Ignitable)
Methylene Chloride (Caustic) (Ignitable)
Petroleum Spirits (Caustic) (Ignitable)
Toluene (Caustic) (Carcinogenic) (Ignitable)
Toluol (Caustic) (Ignitable)
Urea Formaldehyde (Caustic) (Ignitable)

**Aerosols**
Butane (Ignitable)
Chlorinated Hydrocarbons (Carcinogenic)
Heavy Metal Based Pigments (Carcinogenic)
Ketones (Ignitable)
Petroleum Distillates (Ignitable)
Propane (Ignitable)
Toluene (Caustic) (Carcinogenic) (Ignitable)

**Air Cleaners**
Cresol (Caustic?)

**Alcohols**
Benzyl Alcohol
Butanol, iso (Ignitable)
Isopropanol (Ignitable)

**Antifreeze**
Diethylene Glycol
Ethylene Glycol (Caustic) (Carcinogenic)

**Artist's Paint**
"Cobalt Violet" Cobalt Arsenate

**Auto Degreasers**
Tetrachloroethylene (Toxic) (Carcinogenic) (Ignitable)

**Automotive Rubbing Compounds**
Cyclohexane Kerosene (Ignitable)

**Batteries**
Sulfuric Acid (Caustic)
Lead (Carcinogenic)

**Bleach**
Oxalic Acid (Caustic)
Sodium Hypochlorite (Reactive)
Sodium Perborate (Caustic)

**Bottled Gas**
Acetylene Gas
Propane (Ignitable)
White Gas

**Brake Fluid**
Heavy Metal Contaminants

**Brush Cleaners**
Benzene (Carcinogenic) (Ignitable)
Kerosene (Ignitable)
Toluene (Caustic) (Carcinogenic) (Ignitable)
Xylene (Ignitable)

**Carburetor Cleaners**
Cresol (Caustic?)
Ethylene Dichloride
Potassium Hydroxide
Sodium Chromate (Carcinogenic) (Ignitable) (Caustic)

**Caulking Compounds**
Asbestos (Carcinogenic)
Kerosene (Ignitable)
Lead (Carcinogenic)
Phenol (Caustic) (Ignitable)
Xylene (Ignitable)

**Cleaning Solution, Fabric**
Carbon Tetrachloride (Carcinogenic)

**Coffee Pot Cleaners**
Sodium Perborate (Caustic)
Sodium Tripolyphosphate (Caustic)

**Concrete Cleaner**
Isopropanol (Ignitable)
Phosphoric Acid (Caustic)

**Convertible Top Dressing**
Petroleum Naptha (Ignitable)
Stoddard Solvent (Caustic) (Ignitable)
Crawling Insect Killer (powder)
Chlordane

Deck and Patio Cleaners
Phosphoric Acid (Caustic)

Degreasers
Chlorinated Solvents (Carcinogenic)
Dichlorobenzene, ortho-
Dichlorobenzene, para- (Caustic) (Ignitable)
Methylene Chloride (Caustic) (Ignitable)
Petroleum Distillates (Ignitable)
Trichloroethylene (Carcinogenic)

Denture Cleaners
Sodium Perborate (Caustic)

Deodorizers
Dichlorobenzene, para- (Caustic) (Ignitable)
Naphthalene (Caustic) (Ignitable)
Paraformaldehyde (Caustic) (Ignitable)
Sodium Bisulfate (Caustic)

Dishwasher Detergent
Sodium Tripolyphosphate (Caustic)

Disinfectants
Ammonium Hydroxide (Caustic)
Cresol (Caustic?)
Formaldehyde (Carcinogenic) (Ignitable)
Sodium Hypochlorite ( Reactive)

Drain Cleaner
Sulfuric Acid (Caustic)
Dichlorobenzene, ortho-
Hydrochloric Acid (Caustic)
Petroleum Distillates (Ignitable)
Potassium Hydroxide (Caustic)
Sodium Hydroxide (Caustic) (Reactive)
Trichloroethane-1,1,1 (Carcinogenic)

Drywall Materials, Tiles, Cements
Asbestos (Carcinogenic)

Dyes
Heavy Metal Based Pigments (Carcinogenic)

Electrical Insulation
Asbestos (Carcinogenic)

Fiberglass, Resin & Hardeners
Cyclohexanone (Ignitable)

Fire Extinguishers
Carbon Tetrachloride (Carcinogenic)

Fireplace Cleaners
Ammonium Hydroxide (Caustic)
Ethanol (Caustic) (Ignitable)
Kerosene (Ignitable)
Naphthalene (Caustic) (Ignitable)

Fireproofing Materials
Asbestos (Carcinogenic)

Flea Powder
Carbaryl (Sevin)
Chlordane
Dichlorophene

Floor Cleaner
Diethylene Glycol
Ethylene Glycol (Caustic) (Carcinogenic)

Floor Cleaners and Waxes
Ammonium Hydroxide (Caustic)
Petroleum Distillates (Ignitable)

Floor Wax
Diethylene Glycol
Ethylene Glycol (Caustic) (Carcinogenic)

Fluorescent Lamp Ballast
Polychlorinated Biphenyls (Carcinogen) 
(Ignitable)

Furnace Cement
Asbestos (Carcinogenic)
Sodium Silicate (Caustic)

Furniture Polish
Nitrobenzene ( Reactive)
Oil of Cedarwood

Gasoline
Aminestamine derivatives
Benzene (Carcinogenic) (Ignitable)
Ethylene Dibromide
Ethylene Dichloride (Carcinogen) (Ignitable)
Organic Phosphorous compounds
Tetraethyl lead
Toluene (Caustic) (Carcinogenic) (Ignitable)
Xylene (Ignitable)

**Glazes**
Heavy Metal Based Pigments (Carcinogenic)

**Glues**
Methyl Acetate
Acetone (Ignitable)
Alcohols, n.o.s. (Ignitable)
Ammonium Hydroxide (Caustic)
Benzene (Carcinogenic) (Ignitable)
Borax
Camphor (Ignitable)
Ethylene Glycol (Caustic) (Carcinogenic)
Formaldehyde (Carcinogenic) (Ignitable)
Hexane (Ignitable)
Methyl Acetate (Ignitable)
Methyl Methacrylate (Ignitable)
Mineral Spirits (Ignitable)
Petroleum Distillates (Ignitable)
Petroleum Naphtha (Ignitable)

**Herbicides**
Diquat
Paraquat

**Hobby Acid Solutions**
Sulfuric Acid (Caustic)
Nitric Acid (Caustic)
Phenol (Caustic) (Ignitable)

**Hobby Paint and Varnish Removers**
Carbon Tetrachloride (Carcinogenic)

**Hobby Solvent**
Methanol (Ignitable) I
Isopropyl Alcohol (Ignitable)
Butyl Acetate, n- (Ignitable)
Carbitol Carbon Disulfide (Ignitable)
Carbon Tetrachloride (Carcinogenic)
Cellulose (Ignitable)
Cellulose Acetate (Ignitable)
Chlorotoluene, ortho (Ignitable)
Ethyl Acetate (Ignitable)
Ethylene Glycol (Caustic) (Carcinogenic)
Lithotite (Ignitable)
Methyl Cellulose (Ignitable)
Methyl Chloroform Mineral Spirits (Ignitable)
Nitrobenzene (Reactive)
Petroleum Distillates (Ignitable)
Petroleum Naphtha (Ignitable)
Phenol (Caustic) (Ignitable)

**Inks**
Acetic Acid
Aromatic Hydrocarbons (Carcinogenic) (Ignitable)
Chromic Acid (Carcinogenic)
Ethylene Glycol
Ethylene Glycol (Caustic) (Carcinogenic)
Heavy Metal Based Pigments (Carcinogenic)
Sulfuric Acid (Caustic)

**Insulation**
Urea Formaldehyde (Caustic) (Ignitable)

**Joint Compounds, Dry**
Asbestos (Carcinogenic)

**Laundry Products**
Sodium Tripolyphosphate (Caustic)
Tetrachloroethylene (Toxic) (Carcinogenic) (Ignitable)

**Leaded Gasoline**
Lead (Carcinogenic)

**Lubricating Oil**
Heavy Metal Contaminants
Petroleum Distillates (Ignitable)
Tricresyl Phosphate (Caustic)

**Mercury Batteries**
Mercuric Oxide (Carcinogenic)

**Metal Polish**
Oxalic Acid (Caustic)
Phosphoric Acid (Caustic)

**Mothballs**
Dichlorobenzene, mixed (Caustic) (Ignitable)
Napthalene (Caustic) (Ignitable)
Motor Fuel Additive
Butanol, iso (Ignitable)

Nail Polish Remover
Butyl Acetate, n- (Ignitable)
Ethyl Acetate (Ignitable)
Benzene (Carcinogenic) (Ignitable)
Acetone (Ignitable)

Oven Cleaners
Methylene Chloride (Caustic) (Ignitable)
Potassium Hydroxide (Caustic)
Sodium Hydroxide (Caustic) (Reactive)
Trichloroethylene-l, 1,1 (Carcinogenic)

Paint Remover
Butanol, iso (Ignitable)

Paint Strippers
Perchloroethylene (Carcinogenic)
Sodium Hydroxide (Caustic) (Reactive)
Toluene (Caustic) (Carcinogenic) (Ignitable)
Dichlorobenzene, ortho-

Paint and Varnish Remover
Bis(2-chloroethyl)ether (Carcinogenic) (Ignitable)
Acetone (Ignitable)
Alkalis, concentrated (Caustic)
Benzene (Carcinogenic) (Ignitable)
Butanol, iso (Ignitable) Cresol (Caustic?)
Cyclohexanone (Ignitable)
Isoamyl Alcohol (Ignitable)
Isophorone
Methanol (Ignitable)
Methyl Ethyl Ketone (Ignitable)
Methyl Isobutyl Ketone (Ignitable)
Methyl Styrene, alpha (Ignitable)
Methylene Chloride (Caustic) (Ignitable)
Phenol (Caustic) (Ignitable)
Styrene Monomer (Carcinogenic) (Ignitable)
Toluene (Caustic) (Carcinogenic) (Ignitable)
Vinyl Toluene (Ignitable)
Xylene (Ignitable)

Paint Brush Cleaner
Trisodium Phosphate (decahydrate)

Paint
Cadmium Metal
Heavy Metal Based Pigments (Carcinogenic)

Pesticides
Carbaryl (Sevin)
Diazinon
Dichlorovos (DDVP)
Arsenic

Photography Chemicals
Acetic Acid
Ammonium Hydroxide (Caustic)
Catechin
Diaminophynol Hydrochloride
Ferricyanide
Formaldehyde (Carcinogenic) (Ignitable)
Hydrochloric Acid (Caustic)
Hydroxylamine Sulfate
Iodine
Mercuric Chloride
Oxalic Acid (Caustic)
Phenylendiamine,
paraPlatinum Chloride
Potassium Chrome Alum
Potassium Cyanide
Potassium Dichromate (Caustic) (Carcinogenic) (Ignitable)
Potassium Oxalate
Potassium Permanganate
Potassium chlorochromate
Pyrogallic Acid
Selenium Oxide
Sodium Carbonate
Sodium Dichromate (Caustic) (Carcinogenic) (Ignitable)
Sodium Hydroxide (Caustic) (Reactive)
Sodium Hypochlorite (Reactive)
Sodium Thiosulfate Sulfuric Acid (Caustic)
Tertiary Butylamine Borane
Uranium Nitrate (Carcinogenic?)

Polishes
Ethanol (Caustic) (Ignitable)
Isopropanol (Ignitable)
Petroleum Distillates (Ignitable)

Radiator Flushes, Acidic
Boric Acid (Caustic)
Butanol, n- (Ignitable)
Hydrochloric Acid (Caustic)
Isopropanol (Ignitable)
Olefins (Caustic) (Ignitable)
Oxalic Acid (Caustic)
Petroleum Ether (Ignitable)
Potassium Dichromate (Caustic)(Carcinogenic)
(Sodium Bisulfite (Caustic)

**Radiator Flushes, Alkaline**
Butanol, n- (Ignitable)
Isopropanol (Ignitable)
Olefins (Caustic) (Ignitable)
Petroleum Ether (Ignitable)
Potassium Dichromate (Caustic) (Carcinogenic)
(Sodium Bisulfite (Caustic)
Sodium Orthosilicate
Sodium Tripolyphosphate (Caustic)

**Refrigerant**
Dichloro-difluoromethane (Reactive)

**Roof Coatings**
Glycol Ethers (Caustic) (Ignitable)
Petroleum Distillates (Caustic) (Ignitable)

**Roofing Shingles**
Asbestos (Carcinogenic)

**Rubbing Alcohol**
Isopropanol (Ignitable)
Methanol (Ignitable)

**Rug Cleaner**
Trichlooroethane
Naphthalene (Caustic) (Ignitable)

**Rust Inhibitor**
Chromium

**Sealants**
Epoxy Resins (Caustic) (Ignitable)
Polyester Resins (Caustic)
Styrene Monomer (Carcinogenic) (Ignitable)

**Septic Tank Cleaners**
Dichlorobenzene, mixed (Caustic) (Ignitable)
Methylene Chloride (Caustic) (Ignitable)
Petroleum Distillates (Ignitable)
Trichloroethane-1,1,1 (Carcinogenic)
Trichloroethylene (Carcinogenic)

**Shellac and Resin Thinners**
Methyl Isobutyl Ketone (Ignitable)

**Shoe Care Products**
Nitrobenzene (Reactive)
Trichloroethane (Carcinogenic)

**Smoke Detectors**
Mercury (Carcinogenic)

**Smoke Detectors, ionization**
Americium-241 (Carcinogenic?)

**Solvent Based Paints**
Butanol, n- (Ignitable)
Methyl Ethyl Ketone (Ignitable)
Mineral Spirits (Ignitable)
Petroleum Naptha (Ignitable)

**Solvents**
Cresol (Caustic?)
Isopropanol (Ignitable)
Mineral Spirits (Ignitable)
Petroleum Ether (Ignitable)
Petroleum Naptha(Ignitable)
Turpentine (Caustic?) (Carcinogenic?)
Xylene (Ignitable)(Ignitable)

**Solvents and Thinners**
Alcohols, n.o.s. (Ignitable)
Aromatic Hydrocarbons (Carcinogenic)
(Ignitable)
Chloroform (Carcinogenic)
Cutting Oils
Cyclohexane
Dichlorobenzene, mixed (Caustic) (Ignitable)
Diethylene Glycol
Dioxane (Carcinogenic) (Ignitable)
Ethylene Dichloride (Carcinogen) (Ignitable)
Isoamyl Acetate (Ignitable)
Kerosene (Ignitable)
Ketones (Ignitable)
Methylene Chloride (Caustic) (Ignitable)
Perchloroethylene (Carcinogenic)
Petroleum Ether (Ignitable)
Petroleum Naptha (Ignitable)
Phenol (Caustic) (Ignitable)
Turpentine (Caustic?) (Carcinogenic?)
(Ignitable)

**Spot Removers**
Ammonium Hydroxide (Caustic)
Perchloroethylene (Carcinogenic)
Sodium Hypochlorite (Reactive)
Trichloroethane (Carcinogenic)
Stove Lining
Asbestos (Carcinogenic)
Borax

Strippers
Acetone (Ignitable)
Butanol, n- (Ignitable)
Methylene Chloride (Caustic) (Ignitable)
Trichloroethylene-l,l,l (Carcinogenic)

Thermal Insulation
Asbestos (Carcinogenic)

Thermometers
Mercury (Carcinogenic)(Toxic)

Toilet Bowl Cleaners
Sodium Oxalate (Caustic)
Sodium Sulfate (Caustic)
Dichlorobenzene, para- (Caustic)
Hydrochloric Acid (Caustic)
Oxalic Acid (Caustic)(Ignitable)

Transmission Fluid
Petroleum Distillates (Ignitable)
Stoddard Solvent (Caustic) (Ignitable)

Undercoatings
Aliphatic Hydrocarbons
Alkyd Resin
Aromatic Hydrocarbons (Ignitable)
Heavy Metal Pigments
Phenolic Resin

Varnishes and Lacquers
Alcohols, n.o.s. (Ignitable)
Aromatic Hydrocarbons (Carcinogenic) (Ignitable)
Petroleum Distillates (Ignitable)

Varnishes, Shellacs and Lacquers
Acetone (Ignitable)
Butyl Acetate, n- (Ignitable)
Ethanol (Caustic) (Ignitable)
Ethyl Acetate (Ignitable)
Ethyl Carbamate (Carcinogenic)
Urethane Alkylds

Water Based Paints
Butadiene (Caustic) (Carcinogenic)
Chromium
Cuprous Oxide
Ethylene Glycol (Caustic) (Carcinogenic)
Iron Oxide
Styrene Monomer (Carcinogenic) (Ignitable)
Zinc Oxide

Waxes
Acetone (Ignitable)
Alcohols, n.o.s (Ignitable)
Benzene (Carcinogenic) (Ignitable)
Ether (Ignitable)
Polychlorinated Biphenyls (Carcinogen) (Ignitable)
Turpentine (Caustic?) (Carcinogenic?) (Ignitable)

White Lead Putties
Asbestos (Carcinogenic)
Lead (Carcinogenic)

Window Cleaner
Diethyylene Glycol
Trisodium Phosphate (decahydrate) (Caustic)

Windshield Washer Fluid
Isopropanol (Ignitable)
Methanol (Ignitable)

Wood Preservative
Chromium
Pentachlorophenol
Arsenic

Wood Putty
Toluene (Caustic) (Carcinogenic) (Ignitable)

Wood Stains
Benzene (Carcinogenic) (Ignitable)
Ethanol (Caustic) (Ignitable)
Lead (Carcinogenic)
Methanol (Ignitable)
Appendix B

LIST OF EQUIPMENT FOR PERMANENT HHW COLLECTION FACILITY

Furniture
DESK AND OFFICE EQUIPMENT
WORK SHELVES
WORK TABLES FOR WASTE
CHAIRS
STORAGE CABINET

Handling Equipment
SERVICE CART (DOLLY)
DRUM TRUCK/DOLLY
PALLET TRUCK/ LIFT TRUCK / FORK LIFT
SCALES
SPILL CONTAINMENT PALLETS/DECKS
PLASTIC TUBS
TRASH CANS/DUMPSTER
SOLID WASTE CONTAINERS

Tools
TOOL BOX
SCREWDRIVERS
DRUM PLUG WRENCHES
DRUM GAUGE
DRUM PUMP
FUNNELS (FLAM & NON-FLAM)
SHOVELS
CAN PUNCTURE TOOLS
ADJUSTABLE WRENCHES
BALL PEEN HAMMER
CLAW HAMMER
CHANNEL LOCK PLIERS
LONG NOSE PLIERS
VISE GRIP PLIERS
SOCKET SET
CLIPBOARDS
CALCULATORS
PUSH BROOMS
DUST PANS (Non-sparking)
SHOVELS (Non-sparking)
SHOP RAGS
PACKAGING TAPE
DUCT TAPE
BARRIER TAPE
PLASTIC SHEETING
GARDEN HOSES
EXTENSION CORDS

Processing Equipment (optional)
FUME HOOD
PAINT CAN CRUSHER
AEROSOL CAN PUNCTURING SYSTEM
FLUORESCENT TUBE CRUSHER

Safety/Personal Protection
FIRST AID KIT
LEATHER GLOVES
CHEMICAL RESISTANT GLOVES
SAFETY GLASSES
FACE SHIELDS
HARD HATS
SAFETY APRONS
TYVEK SUITS
WORK BOOTS
RESPIRATORS (1/2FACE)
RESPIRATOR FILTERS
PESTICIDE PREFILTERS
EMERGENCY SHOWER
EYE WASH
TRAFFIC CONES

Spill/Emergency response
HAZCAT CHEMICAL IDENTIFICATION KITS
EMERGENCY AIR HORNS
DIGITAL PAGERS
FIRE EXTINGUISHERS (DRY CHEMICAL)
FIRE ALARM
ABSORBENT MATERIAL (kitty litter, sweeping compound)
ABSORBENT BOOMS
BAKING SODA
SPILL KITS

Signs
SIGNS FOR SITE
DRUM LABELS
NO SMOKING SIGNS
FIRE EXTINGUISHER SIGNS
FIRST AID KIT SIGNS
DOT SIGNS
OSHA SIGNS
NFPA PLACARDS

Misc.
SURVEY SHEETS
INTAKE FORMS
REFERENCE DOCUMENTS
WINDSOCK
Appendix C
REFERENCES


