- WRAP Program
- Medical Facilities Project
- Areas Of Opportunities
- Successes - Progress & Projects
- Additional Opportunities
- Additional Information
Iowa Waste Reduction Assistance Program

- Technical Assistance
  - On-Site Waste Reduction Opportunity Assessments
  - On-Site Pollution Prevention Workshops
  - Information/Technology Clearinghouse
  - Network Of Service Providers & Resources

- Larger Businesses/Institutions
  - 100 Or More Employees In State
  - Large Quantity RCRA Hazardous Waste Generator

- No-Cost, Non-Regulatory, Confidential
- Sr. Industry Professionals
125 On-Site Assessments
45 Pollution Prevention Workshops
Tens Of Millions Of Dollars/Year Savings
Tens Of Thousands Of Tons/Year Waste Eliminated Or Diverted
Information & Technologies Transferred Statewide
  → Within Industries & Business Sectors
  → Between Industries & Sectors
• **EPA Definition:**
  → Pollution Prevention = Source Reduction

• **Practical Definition:**
  → Using The Right Technology At The Right Time To:
    ✷ Reduce Waste,
    ✷ Recycle It More Effectively
    ✷ Treat It More Efficiently Or Effectively, or
    ✷ Dispose Of It In A More Environmentally Sound Manner

• **Other Terms:**
  → Waste Reduction
  → Waste Minimization

• **Source Reduction Most Desirable**
MEDICAL FACILITIES PROJECT

- Region VII EPA Funded
- Document Pollution Prevention
  → Progress, and
  → Opportunities
- Consider Variety Of Facilities
  → Various Sizes
  → Private & Public
  → Care Centers
Areas Of Interest

- Multiple Waste Issues
  - Hazardous
  - Infectious/Bio-Hazardous
  - Non-Hazardous
  - Toxics Use Reduction

- Source Reduction
- Recycling
- Incineration
- Energy Efficiency
- Cost Effectiveness
PARTNERS

- U. S. Environmental Protection Agency
  → Iowa Section (Hazardous Waste) - Funding
  → Pollution Prevention - Support
- Iowa Hospital Association
- Iowa Society Of Hospital Engineers
- Iowa Dept. Of Natural Resources
- Iowa Waste Reduction Center
On-Site Assessments

- Des Moines General Hospital
- Iowa City VA Medical Center
- Palmer Lutheran Medical Center - West Union
- Pleasant View Care Center - Whiting
- Story County Hospital - Nevada
WASTE GENERATED

![Bar Chart]

- **Total Waste**
- **Landfill Waste**

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<th>C</th>
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<td>6.00</td>
<td>20.00</td>
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* Avg. Patient Population*

* Excludes Outpatients
WASTE COST

Dollars/ Patient/ Day

Avg. Patient Population*

* Excludes Outpatients
TRENDS

- More Cost Effective Recycling
  → Reducing Costs
  → Increasing Revenues
- Packaging Reduction
- Minimizing Disposables
- Maximizing Energy Efficiency
- Availability of Less Toxic/Hazardous Materials
CHALLENGES

- **Source Reduction Is Top Priority** - If You Don’t Generate A Waste You:
  - Don’t Pay For It
  - Don’t Pay For Handling It
  - Don’t Pay To Dispose Of It
  - Can’t Be Regulated For It

- **Recycling Must Be Sustainable**
  - Technically Feasible
  - Cost Effective

- Involving All Staff

- Documenting Progress And Savings
- Waste Segregation & Characterization
- Paper & Plastics
- Purchasing
  - Packaging Reduction
  - Reusables vs. Disposables
  - Maximum Recycled Content
- Marketing Recyclables
- Energy/Utility Efficiency
- Toxics Use Reduction
• Cleaning Chemicals
  → Larger Containers
    • Reduced Supply Costs
    • Less Container Waste
  → Bulk Dispensers
    • Less Material Waste
    • Less Employee Exposure
  → Consolidate Products

• Less Toxic Alternatives
  → Shine Products Minimize Stripping/Waxing
  → Less Toxic Cleaners
  → Revised Lab Procedure Minimize Haz. Waste
CAFETERIA/DIETARY

- Maximize Reusables/Washables
  - Plastic Service, Meal Utensils
  - Permanent Drink Cups
  - Canned/Bottled Drinks With Deposit
  - Cloth Napkins

- Minimize Food Waste To Landfill

- Minimize Container Waste
  - Milk, Etc. Purchased In Larger Containers
  - Purchase Foods In Largest Practical Containers

- Don't Give Them What They Won't Eat
LINENS & BEDDING

- Alternative Linen Systems
  - Longer Life
  - Less Expensive To Dry
  - Harder To Stain

- Eliminate Overlay Mattresses

- Minimum Packaging/Handling

- Laundry Efficiency
  - Automated Chemical Dispensing
  - Heat/Utility Efficiency
UTILITY EFFICIENCY

- Chillers
  → Efficiency
  → CFC Transition
- Windows
- Lighting
- Laundry Heat Efficiency
- Water Reuse
PAPER MINIMIZATION

- Reducing Reports
- Two-Sided Copying
- "Paperless" Office Project
  - EPA
  - Contact: Mary Gerken - Ph: 913/551-7541
• Purchasing

→ Standardizing/Revising Material Specs.
  ✦ To Allow Recycled Content
  ✦ Performance Based Specs.
→ Partnering With Suppliers To:
  ✦ Minimize Packaging
  ✦ Find Recyclable Alternatives
• Incineration
  → Operating Efficiency
  → Infectious Waste Dilution/Segregation
  → Alternatives

• Purchasing/Procurement
  → Further Packaging Reduction
  → Alternatives For Reuse/Recycling
  → Maximizing Recyclability
    ✷ No. 2 Plastic vs. No. 5
    ✷ Change Design
Recycling
- More Involvement
- Better Marketing
- Waste Exchanges
  - By-Product & Waste Search Service

Utility Efficiency
- Water Use Reduction
- Study Electrical Consumption/Billing
- Lighting - New Technology
- Iowa Energy Bank
- Energy Audits
  - Utilities
  - EADC
  - Consultants
WHERE TO START

- Facility Assessment
  - Waste Stream Date & Characterization
  - Where, How & When Waste Is Generated
  - Who Generates It

- Personnel Education & Involvement
  - Workshops
  - Task/Area Teams
  - Confirm Results

- Facility Planning & Implementation
  - Pollution Prevention Committee
  - Policy
  - Goals
  - Implement The Easy Ones First
POLLUTION PREVENTION SUCCESS

- Management Commitment
- Employee/Staff Involvement
- Part Of Everyday Business & Planning
- In-House
- Other Medical Care Facilities
- Trade Associations’
- Publications
- Consultants
- Technical Assistance Programs
- Clearinghouses/Bulletin Boards
- Regulators
- NTTC
HOTLINES

- IDNR - EPD 515/281-8941
- IWRC 800/422-3109
- IDNR - WMAD/WRAP 800/367-1025
- BAWSS 800/422-3109
- NTTC 800/678-6882
- IAOSHA 515/281-5352
- IHA 515/288-1955
ALBANY MEDICAL CENTER

POLLUTION PREVENTION PROGRAMS

- "Cure Waste" Program
- Energy Partners Program
- Environmental Quality Programs
CURE
Center-wide Uniform REDuction, Reuse & Recycle
WASTE
at Albany Medical Center

A Waste Management Strategy for the Twenty-First Century
ALBANY MEDICAL CENTER

Mission Statement
"Cure Waste" Program

To care for the community by developing, implementing and maintaining a comprehensive waste management program that cares for, respects, and protects the environment of the community.
CURE WASTE PROGRAM
PROGRAM HIGHLIGHTS

- Recycled 6.3 million pounds since 1991
- Reduced 500,000 Pounds since 1991
- Recycling 2.3 million pounds per year - 42%
- Demonstrated value of organic composting
- Reduced costs - $800,000
- Avoided costs - $1.2 million
- Medical waste reduced 2 million pounds per year
CURE WASTE PROGRAM
PROGRAM HIGHLIGHTS

continued

• Hazardous waste reduction plan implemented

• Closed down two incinerators

• Waste program became a public relations asset

• Cure waste as a Community Service Program

• Regional Plan - Medical Waste

• Regional Plan - Hazardous Waste

• EPA Waste Reduction Grant
ALBANY MEDICAL CENTER
WASTE PROGRAM

BEFORE 1991

- Operated Quasi - Regional incinerator - No pollution control

- Incinerated 3.6 million pounds a year

- All waste from patient areas - "Red Bags"

- NYS mandate pollution control - January 1, 1992

- Developed plan to install pollution control equipment $1 million
ALBANY MEDICAL CENTER WASTE PROGRAM

continued

BEFORE 1991

- AMC recycles less than 50,000 pounds a year
- AMC waste practice draws community opposition
- AMC works with HANYS to promote upgrade of incinerators
- No commitment or interest in regional plans
- No Cure Waste Program
ALBANY MEDICAL CENTER

"CURE WASTE" PROGRAM
PHASE I - 1991/1992

- Developed Cure Waste Program
- Developed and implemented plan
- Established Cure Waste Team
- Implemented Phase I - "Conventional Programs"

- Multi-Strategy approach - opportunities
  - Waste Reduction
  - Product Reuse
  - Recycling
CURE WASTE PROGRAM PHASE I

continued

• Patient care areas not included

• Reduced costs $260,000

• Recycled 1.7 million pounds

• Developed EPA grant proposal

• Established mission and goals
ALBANY MEDICAL CENTER

"CURE WASTE" PROGRAM
PHASE II - 1993/1994

- Expanded program to patient care areas
- Implemented EPA grant activities
- Expanded Baxter supplier partnership
- Developed product management model
- Health Care Resource Conservation Coalition
- Organic waste composting pilot program
ALBANY MEDICAL CENTER

"CURE WASTE" PROGRAM
PHASE II - continued

• Reduced costs by $540,000

• Implemented hazard waste reduction plan

• Recycled 4.6 million pounds - 42%

• Developed residential sharps program

• Generated 1.47 million pounds of organic compost
ALBANY MEDICAL CENTER
WASTE PREVENTION OPPORTUNITY
PATIENT CARE SOURCE SEPARATION PROGRAM

- Waste segregation
- Hazard minimization
- Promotes recycling
- Improves internal environment
- Reduces space demands
- Reduces elevator usage
- Improves quality
- Reduces Costs
  - Labor
  - Packaging
  - Transportation
  - Disposal
ALBANY MEDICAL CENTER

WASTE PREVENTION OPPORTUNITY

PARTNERSHIP WITH BAXTER AS A SUPPLIER

- Direct input to Baxter packaging task force
- Telephone book recycling program - Vernacare
  City of Albany
  Grand Union Markets
- IV products recycling program
- Product oriented waste management model
ALBANY MEDICAL CENTER

WASTE PREVENTION OPPORTUNITY

PARTNERSHIP WITH BAXTER AS A SUPPLIER

continued

• Supplier environmental impact information

• Support Healthcare Resource Conservation Coalition

• Baxter "Access Program"

• Product audit with Baxter
ALBANY MEDICAL CENTER

PRODUCT ORIENTED WASTE MANAGEMENT MODEL

- Integration of product management and waste management
- Product oriented waste audit
- Waste assessment as component of "Value Analysis"
- Source separation in patient care areas
- Development of "Material Waste Data Sheet"
- Guidelines for environmental assessment of supplies
- Supplier and user product review
ALBANY MEDICAL CENTER

Waste Prevention Opportunities
Product Reuse

- Switch to reusable under pads
- Replace disposable diaper with reusable
- Converted to reusable breast pumps
- Eliminated disposal blood pressure cuffs (OR)
- Reusable coffee mugs
- Reduced use of disposable cafeteria ware
- Reusable medical waste containers
ALBANY MEDICAL CENTER

Waste Prevention Opportunities
Waste Reduction

- New Cafeteria Dishwasher
- Expanded value analysis
- Installed Baxter Vernacare
- Implemented Product Management approach
- Awarded EPA Grant
- Eliminated Ash - 800,000 pounds per year
ALBANY MEDICAL CENTER

Waste Prevention Opportunities

Recycling

- Conventional Recycling Program
- Organic Waste Composting Program
- Community - Wide Phone Books
- Baxter IV Products Recycling
- Recycled PCB Ballast's
- On-Site MRRF
- Recycle Laser Printer Cartridges
- Expanded use of Recycled Products
- Patient Care Source Separation
- Recyclable Sterilization Wrap
ALBANY MEDICAL CENTER

Waste Prevention Opportunities
Value Analysis Waste Reduction

- Eliminated Patient Kits

- McGaw Syringe Pump - Eliminated mini-bags, tubing

- Change from Betadine swabs to wipes

- B-D urine transfer kit - individual items

- Baxter Modified disposable trays

- Lemon and Glycerin Swaps Eliminated
A Waste Management Strategy

For the Twenty-First Century

Albany Medical Center

CURE

Center for Urban Recycling and Extension, Resource & Recovery
Mission Statement
"Cure Waste" Program

To care for the community by developing, implementing, and maintaining a comprehensive waste management program that cares for, respects, and protects the environment of the community.
The Plan

- Strong Management Commitment
- Coalition and Partnerships
- "Cutting Edge" Philosophy
- "Can Do" Attitude
- Clear Waste Management Goals and Objectives
- Aggressive "Cure Waste" Campaign
- Multi-Strategy Plan
- "Community Service" Approach
Basis For Management Commitment

- Responsible Institutional Policy
- Cost Reductions and Avoided Costs
- Community Relations and Public Image
- Response to Employee Concerns
- Commitment to Local Government
- Conserve Natural Resources
- Comply with Legislative Mandates
Waste Management Philosophy

- Waste Management is "Product-Oriented" Material Management
- It Doesn't Happen Without an Effective Plan
- It Is Hard Work, Requiring Time and Effort
- It Requires an Aggressive Multidisciplinary Team
- The Plan Should Be a Simple, Effective Blueprint
- It Is Much More Than Just Waste Disposal
Waste Management Philosophy (cont’d)

- It Is Much More Than Just Medical Waste
- The Problems Will Not be Solved by Government
- The Problems Will Not Just Go Away, but They Can be Solved
- The Regulatory Picture Is Clear Enough to Make Decisions and to Take Action
- The Costs are Significant, but They Can be Controlled
The Team

- The "Cure Waste" Task Force
- Multidisciplinary Team
- AMC "Cure Waste" Partners
- Implementation- and Action-Oriented
- Task Force Responsibilities/Membership
- The "Value Analysis" Committee
- The People of the Medical Center
Albany Medical Center

Plant Management

- Overall Responsibility for Waste Management
- Coordinates Committee Activities – Acts as Chair
  Person
- Functions as the Committee’s “Designated Driver”
- Responsible for all Financial Aspects
Albany Medical Center

Plant Management (cont’d)

- Manages and Operates Waste Processing and Recycling Facility
- Represents AMC on Local, Regional, State, and National Level
- Ongoing Assessment of New Technologies and Systems
- Ongoing Assessment of Regulatory Changes
Material Management

- Overall Responsibility for Value Analysis Committee
- Overall Responsibility for Purchasing of Products
- Monitoring of Product Utilization
- Assessment of Re-Usables Versus Disposables
- Responsible for "Stockless Inventory"
- Responsible for Vendor Contracts and Vendor Commitment to Waste Reduction and Efficient Packaging
- Program Coordinator for "Vernacare" Waste Reduction Program
Albany Medical Center

Environmental Services

- Waste Collection and Transportation
- Police Quality of Collected Materials
- Monitor Source Separation
Albany Medical Center

The Process

- Comprehensive Waste Assessment Process
- Multistrategy Campaign
- "Action Steps" for Recycling
- "Action Steps" for Waste Reduction
- Internal Marketing Plan
- Community Participation and Involvement
- Role of AMC "Partners"
- New Objectives Each Year
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% OF TOTAL RECYCLED          | 13.2  | 22.5  | 42.3  | 40.2          |
% OF NON-REGULATED RECYCLED  | 41.1  | 45.3  | 54.9  | 46.4          |

*TOTALS DO NOT INCLUDE HAZARDOUS WASTE MATERIAL AND LOW LEVEL RADIOACTIVE WASTE.
C:\recycomp.
RESOURCES CONSERVATION SERVICES, INC.
CAPITAL DISTRICT COMPOST FACILITY

Prepared for the Albany Medical Center
February 27, 1992

I. ACCEPTABLE MATERIALS -- (ORGANICS)

- All cafeteria food waste, food scraps, old produce
- Food contaminated paper, paper cups, paper plates
- Corrugated, waxed or dirty
- Wood wastes, pallets, brush, wooden coffee stirrers
- Grass clippings, yard waste
- Newspapers, magazines, mixed office paper, and other paper without markets

II. UNACCEPTABLE MATERIALS -- (NON-ORGANICS)

- Any medical or infectious waste
- Plastics, rubber gloves, tubing, styrofoam cups
- Diapers
- Metal, steel, copper, aluminum, tin
- Rocks, bricks, mortar
- Clothing, scrubs, linens
- Cleaning solutions, bleach, lye
- Waste oil, distilled petroleums
- Medical bottles, glass/plastics
- Other non-organic materials
"Value Analysis"

- Value
- Cost
- Quality
- Safety
- Effectiveness
- Waste Characteristics
Partners bring value to AMC

- Regional Medical Waste Plan
- Telephone Book Recycling Program
- Organic Waste Composting Program
- IV Products Recycling Program
- Baxter Packaging Taskforce
- Regional Hazardous Waste Contract
- Waste Reduction / Product Management
The "Value Added" by a Partnership

- Resources
- Expertise
- AMC Valued as a customer
- New & Innovative Opportunities
- Committed to the Environment
- Share common ground
- Proactive
- "Models " & "Pilot Programs"
- A "Win-Win" situation
NOTICE

IT COSTS $1.20 TO DISPOSE OF A CLEAR BAG OF TRASH AND $11.50 TO DISPOSE OF A RED BAG.

PLEASE DO NOT PUT ANYTHING IN RED BAGS EXCEPT TRUE REGULATED MEDICAL WASTE.

CALL 5105 FOR INFORMATION
PUT ONLY THE FOLLOWING IN THIS CONTAINER:

- BLOOD BAGS
- BLOOD SOAKED MATERIAL
- CONTAINERIZED BODY FLUIDS OVER 20 cc
MATERIAL WASTE DATA SHEET

PRODUCT: SURGEONS' GLOVE - FOLDED STYLE

PRIMARY PACKAGE DESCRIPTION: FLEXIBLE SHALLOW DRAW BLISTER FILM WITH PEELABLE PRINTED PAPER COMPOSITE

COMPOSITION DETAIL:

A. PEELABLE LIN COMPOSITE:
   PAPER
   LDPE ADHESIVE
   HDPE FILM
   EVA HEAT SEAL COAT

B. FLEXIBLE BLISTER FILM
   LDPE, EVA, Ionomer BLEND
   100

DISPOSAL DETAIL:

LANDFILL:
A. SAFELY LANDFILL; PAPER AND POLYMERS DO NOT POSE LEACHING CONCERNS. INKS DO NOT CONTAIN HEAVY METALS BEYOND CONEG GUIDELINES. SEE COMPOSITION FOR MASS PER UNIT.
B. INERT COMPATIBLE POLYMER BLEND. NOT LEACHING CONCERN.

COMPOST
ONLY PAPER ELEMENT OF "A" WILL DEGRADE BY COMPOST

INCINERATION
A. NO SIGNIFICANT TOXIC COMBUSTION BY PRODUCTS KNOWN
   NO SIGNIFICANT ASH LEACHATES
B. NO SIGNIFICANT TOXIC COMBUSTION BY PRODUCTS KNOWN
   NO MEASURABLE ASH (CATALYST RESIDUE)

RECYCLE
A. PAPER IS 100% SOFTWOOD BLEACHED KRAFT VIRGIN FIBER
B. COMPATIBLE POLYMER BLEND MAY RECYCLE IN GENERAL LDPE STREAM OF

SECONDARY PACKAGE

TERTIARY PACKAGE
ALBANY MEDICAL CENTER
PRODUCT FOCUSED WASTE MANAGEMENT MODEL

PRODUCT AUDITS
Analyze product and Material Management Practices by doing a "walk-around" audit.

- Identify & classify the waste management characteristics of major patient products including production packaging.
- Evaluate "cradle to grave" flow, distribution, and eventual disposal of the product and its packaging to identify opportunities for recycling and source separation.
- Evaluate operational factors associated with source separation, including labor.
- Identify specific products, packaging, material management practices and/or waste management practices which result in unnecessary waste or limits source separation.
- Referrals to Value Analysis Committee

VALUE ANALYSIS PROCESS
(Product Assessment and Review)
- Product cost.
- Cost associated with product use.
- Quality
- Safety and Risk Management
- Effectiveness
- Infection control
- Product reuse
- Waste assessment and environmental impact
- Product decisions

ANNUAL SUPPLIER AND USER PRODUCT REVIEW

SUPPLIER ENVIRONMENTAL IMPACT STATEMENT

M.W.D.S.
(Material waste data sheet)
- Description of the product: primary, secondary and tertiary packaging.
- Volume and weight of product and packaging.
- Waste classification of packaging.
- Recycle content.
- Recycling composition statement.
- Biodegradable, compost content.
An Ounce of Prevention
Waste Reduction Strategies
for Health Care Facilities

written by
Connie Leach Bisson
Glenn McRae
Hollie Gusky Shaner, R.N.

ASHES
CURE WASTE: ONE HOSPITAL'S FORMULA FOR SUCCESS
CLAUDE ROUNDS, PE

What hospital in these times would not be interested in a cost-effective, safe, and environmentally sound approach to reducing the facility's wastestream or in a waste management program that enhances its public image? Many facilities are actually trying to develop waste management strategies that will take them into the next century. The efforts of one hospital in upstate New York may provide some helpful ideas and practical information for these facilities.

Like many other hospitals, the Albany Medical Center, located in Albany NY, was faced with the problem of developing and implementing a comprehensive waste management plan while struggling with the financial and regulatory constraints that have become all too common in the health-care industry. Despite the obstacles, Albany Med has found what appear to be the right formula and the best ingredients for a successful program. The result is known as the Cure Waste Program, and it has become an example of a waste management strategy that works. This article provides highlights of the Cure Waste Program and shows how the lessons learned at Albany Med can help other facilities in their own program development.

THE WASTE MANAGEMENT CHALLENGE
A number of health-care facilities in the United States recognize and respect the need to protect the environment and have already made a strong commitment to do so. Many others are being encouraged to make similar commitments by their community and by environmental groups. These commitments—some voluntary and some forced—have helped to remind the health-care industry that its primary mission is caring for the community it serves, which includes caring for the environment that affects the health, safety, and well-being of the community.

Developing and implementing effective programs to reduce, source separate, and recycle hospital wastes, including wastes generated by the care and treatment of patients, is one of the most significant environmental challenges the health-care industry faces. A hospital's ability to meet the environmental challenge depends on the design, manufacture, manage-
AMC
Findings of a Packaging Review

Linen packaging needs to be re-examined. Products formerly were string tied into dozens. Presently a heavy plastic wrapped is being used.

These seems to be a general trend to over package, especially thru the use of corrugated segregation inserts.

Cold Packs- Outer cardboard container, with four inner cardboard dividers. Each cold pack is individually packaged.

Scrub Care- Dispenser packaging limits the number of units which could be bulk packed.

Non-sterile containers- Cardboard outer, cardboard insert, and product is wrapped in individual plastic.

Neonatal Lumbar Puncture Tray- What impact does coating on outer packaging have on recycling? Applies to all similar trays.

Venti Mask - Could product be packaged in paper, product information printed on paper wrap.

Thin Wall Canister- Why the inner cardboard, and plastic wrap for containers? Also does thin-wall instability increase the chance of accidental exposure to body fluids by waste handlers?

Vent Circuit- Why is each wrapped individually, in addition to a large inner plastic bag? The product is not sterile. Many times unsterile product is wrapped in individual plastic bags. Is this necessary? (Example airways are not wrapped, but a urinary leg bags are)

Non-Conductive Bulk Tubing- Wrapped in plastic, in addition to a huge outer cardboard container. Is there a more efficient package?

Extension Tube- Outer cardboard, white board inner packaging, and products are then individually wrapped. Is there a more efficient package?
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- To provide leadership, Focus and Direction
- To Educate and Communicate
- Share case studies and success stories
- Provide National Information exchange
- Promote common interests
"CURE WASTE": ONE HOSPITAL'S FORMULA FOR SUCCESS"

A WASTE MANAGEMENT STRATEGY FOR
THE TWENTY-FIRST CENTURY

PHASE 1

THE PLAN

THE TEAM

THE PROCESS

THE RESULTS

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Albany, New York
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Introduction

Is your hospital interested in a cost effective, safe and environmentally sound approach to reducing the facility’s waste stream? Is your hospital interested in a waste management program that enhances its public image? Is your hospital interested in developing waste management strategies for the Twenty-first Century? If so, the efforts of at least one hospital in upstate New York may provide you with helpful ideas and "How To" information to improve your facility’s waste management plan.

The Albany Medical Center, located in Albany, New York, like many other hospitals, was faced with the problem of developing and implementing a comprehensive waste management plan while at the same time struggling with the financial and regulatory constraints which have become all too common in the world of healthcare. Despite these and other obstacles the Albany Medical Center has found the right formula with the best ingredients for a successful program. This Program known as the "CURE WASTE" Program has become an example of a waste management strategy that works. This paper will provide highlights of the "CURE WASTE" Program at the Albany Medical Center and how the lessons learned at the Center can help other facilities in their own program development.

Hospitals and the Environment

A number of healthcare facilities in the United States recognize and respect the need to protect the environment. These institutions have already made a strong commitment to the environment, while many others have been encouraged to make similar commitments by their community and environmental groups. These actions, some voluntary, some forced, have reminded the healthcare industry that its primary mission is caring for the community it serves and that this caring includes caring for the environment which affects the health, safety and well being of the community. The increased focus on hospitals and their place in the community and its environment has emphasized the need for hospitals to develop and demonstrate stronger, more visible commitments to the environment. The willingness and ability to deliver on this commitment is a challenge that will confront most hospitals, now and in the future.
The Waste Management Challenge

The development and implementation of effective plans and programs to reduce, source separate and recycle hospital wastes, including wastes generated by the care and treatment of patients is among the most significant environmental challenges now facing the healthcare industry. In this regard, the design, manufacturing, management and use of healthcare products and the subsequent waste generated by these products play a major role in a hospital's ability to meet this environmental challenge. Hospital administrators, waste management professionals, government regulators, environmental groups and the general community all recognize the need for a comprehensive approach to the management of hospital generated wastes. However, despite the importance of this issue, there is limited published information available in the form of public policy, regulatory standards and technical guidelines to help healthcare facilities meet this challenge.

The successful development of comprehensive programs, to date, has also been limited by the public and regulatory perception that most patient generated waste is medical waste and therefore infectious and hazardous. In many cases, concern for these hazards and risks have resulted in an ultra-conservative approach to hospital waste management with many hospitals treating a significant portion of the solid waste generated in patient care and clinical areas as medical waste. This conservative approach has directly affected the willingness and ability of hospitals to source separate, recycle and reduce this waste stream. A waste stream which in most cases includes general solid waste, such as packaging from healthcare products and supplies, that never come in contact with an infectious patient.

The development and implementation of practical waste management models that include waste reduction, source separation and recycling in patient care and clinical areas will be of great value to a healthcare facility. Such programs will provide opportunities to reduce the volume of both general solid waste and medical wastes resulting in a reduction in the costs of off-site transportation, treatment and disposal. Hospitals with on-site incinerators will also benefit by reducing the amount of plastics in the waste stream and the air contaminants normally produced by the incineration of such plastics. An effective waste management plan can also be a positive factor enhancing the public image of a facility. This is especially true in cases where there is public opposition to on-site incineration.
The healthcare industry cannot look to regulatory agencies and government for easy solutions and/or specific guidelines. The development of model programs with effective "how to" information and guidelines must come from within the healthcare community. In many cases the development of these hospital based programs will require that the progressive hospitals act now to "break new ground" with new innovative approaches to the management of their wastes. Many hospitals have already recognized the need for and value of "innovation" and "pioneering" in their waste management philosophy. These hospitals have assumed a leadership role in the development of comprehensive waste management programs and have already successfully faced the environmental challenge. These same hospitals, by nature of their efforts, have broken the new ground that will provide helpful models that can serve as an example for use at other healthcare facilities.

The Albany Medical Center (AMC)

The Albany Medical Center (AMC) is one of the progressive institutions which has made a strong commitment to its community and its environment. The Medical Center, with its innovative "CURE WASTE" Program is already recognized as a national, state and regional leader in the area of waste management. The Center's "CURE WASTE" Program has been used and presented as a model and case study at several state and regional conferences. The "CURE WASTE" Program has successfully developed and implemented steps to reduce the Medical Center's waste stream by over 2.4 million pounds in two years. The success enjoyed by this program is the result of a comprehensive, multi-strategy approach with a "cutting-edge" philosophy and aggressive and tough waste management goals. These goals include the development of safe, cost effective and environmentally sound approaches to reducing the Center's waste stream.

The Albany Medical Center is the largest healthcare facility in northeastern New York State and eastern New England and is the region's only tertiary care facility. The Medical Center is a 655 bed university hospital, a medical college and a medical research facility. The Center employs over 5000 employees and on a given day can be host to over 8000 employees, staff, patients, visitors and students. The composition, size, nature and activities of the Medical Center make the Center the region's most complex waste generator. Nowhere in the region is there another facility, institution, business or industry with such a large waste stream with as much diversity. Diversity that includes regulated medical waste, hazardous waste, low level radioactive waste, construction and demolition waste, general solid waste and recyclable materials.
The Medical Center, through the Iroquois Healthcare Consortium, is the leading participant in the Regional Medical Waste Plan developed by the Consortium and Browning-Ferris (BFI). This Regional Medical Waste Plan, which involves the use of a regional autoclave, provided an opportunity for the Medical Center to close down and abandon its two (2) on-site medical waste incinerators avoiding the need to spend over 1.5 million dollars to upgrade these incinerators to install pollution control technology mandated by the State of New York. The Medical Center is also the leading participant in the Regional Hazardous Waste Plan developed by the Consortium and Clean Harbors Company. These regional waste plans, which have been nationally recognized for their quality, value and excellence, provide the Medical Center with an opportunity to effectively manage these difficult waste streams. These regional plans also provide the Medical Center with an opportunity to focus its management energy and resources more effectively on waste reduction, product reuse and recycling.

The Center's waste management program includes a number of waste reduction, product reuse and recycling strategies including "conventional" recycling programs. These conventional recycling efforts, including cardboard, paper, glass, tin, etc. are modeled after successful programs developed and implemented in other industries. The Medical Center, like most hospitals, has a sizable administrative operation and as a result has developed a program to recycle office paper. This component of the Center's recycling program, with the exception of the confidential records, is similar to office paper programs now in place at many office buildings. The Medical Center, by the nature of its service to in-patients, in reality, operates the community's largest restaurant and the region's largest hotel. As a result the Center was able to develop and implement the same type of recycling programs normally found in the hotel and restaurant industries. The similarities between the Medical Center and the restaurant and food processing industry, when combined with the Center's successful "CURE WASTE" Program, led to the selection of the Medical Center as the first hospital in New York State to be directly involved as an active participant in an organic composting program. The Medical Center joins the region's largest market chains as the main generators of compostable organic waste recycled at a facility developed jointly by the neighboring Town of Colonie and Browning-Ferris (BFI).

The "CURE WASTE" Plan

No program as important, expensive and complex as a hospital waste management program should be developed without the development of a plan. The waste management program at the
Albany Medical Center has been structured and developed as a simple blueprint which includes the following components:

- Strong Management Commitment
- "Can Do" Attitude
- "Cutting Edge" Approach
- Coalitions and Partnerships
- Aggressive Waste Management Goals
- Active "CURE WASTE" Campaign
- Multi-strategy Plan
- "Community Service" Approach

**The Management Commitment**

The commitment of management is an essential, if not the most important aspect of any waste management program. This commitment should provide a "green light" to develop, implement and succeed. The commitment from management should affirm the purpose and value of the program and answer the following questions:

- Why Recycle?
- Why Reuse Products?
- Why Reduce Wastes?
- Why Source Separate?
- Why Precycle?

At the Albany Medical Center the commitment is loud and clear. The Medical Center’s Board of Directors, Chief Executive Officer and Administration have demonstrated a strong and visible commitment to the "Cure Waste" Program. The institutional commitment at the Medical Center is strong and continues to be strong because the "CURE WASTE" Program provides the following management and administrative benefits:

- Responsible Institutional Policy
- Commitment to Environment
- Cost Reductions and Avoided Costs
- Community Relations and Public Image
- Response to Employee Concerns
- Commitment to Local Government
- Conserve Natural Resources
- Comply with Legislative Mandates
The Medical Center, in accordance with the commitment outlined above, recognizes that the "CURE WASTE" Program must have leadership equal to the many challenges that confront the program. In this regard the Medical Center has designated the Vice President for Plant Management as the "designated driver" and "managing partner" responsible for the overall coordination of the Waste Management Program. In addition the Medical Center’s Vice President for Material Management is also a principle partner in the program. A partner who also plays a major leadership role, especially in the areas of product management and value analysis. The active participation and teamwork of these two administrative level "program partners" and the frequent involvement of other center executives is a major factor in the Program’s success.

The Program Philosophy

A hospital’s waste management program, like any major management and organizational effort, should be developed in accordance with the specific philosophy, values and beliefs of the institution. The philosophy of each institution will determine the overall direction for the program for that facility. Will the program be aggressive or passive? Will the facility be proactive or reactive? Will the facility be a leader or a follower? The waste management philosophy at each facility should be site specific and based on a number of factors including the facility location, regulatory requirements, available services, waste management alternatives, etc.

The philosophy at the Albany Medical Center and the Center’s overall mission, vision and values have played a major role in the character and quality of the Center’s Waste Management Program. The "CURE WASTE" Program has been built upon the following basic "values and attitudes" which have given the "CURE WASTE" Program a clear "can do" attitude and a willingness to use a "cutting edge" approach:

The Center recognizes and respects its role in the community and its responsibility to the environment.

The Center believes that it has an obligation to develop a strong, financially viable waste management program.

The Center believes that waste management in patient care and clinical areas is "Product Oriented" material management and that there must be a strong linkage between the Center’s waste management and material management responsibilities.
The Center believes that waste management is much more than just waste disposal and that hospital waste management is much more than just medical waste.

The Center believes that waste management doesn’t happen without an effective plan and that the plan should be a simple, effective blueprint.

The Center believes that effective waste management is hard work, requiring the time, effort and commitment of an aggressive multi-disciplinary team.

The Center recognizes and understands that waste management problems will not just go away and that such problems will not be solved by government.

The Center is confident that waste problems can be solved and that the waste management regulatory picture is clear enough to make decisions and to take action.

The Center knows that waste management costs are significant, but also confident they can be managed and controlled.

The basic waste management philosophy presented above are not unique to the Albany Medical Center. Many of the concepts endorsed by the Center represent the common attitude and philosophy found at other progressive facilities with successful programs.

**The "CURE WASTE" Partners**

The Albany Medical Center as a tertiary care hospital and academic health science facility understands that it has limited financial resources and technical expertise in matters related to the management of waste. The Center also understands that it must work closely with local government, waste service companies and the manufacturers of healthcare products to affect change and develop, implement and financially support innovative approaches to both waste management and product management. In response to this need the Medical Center has established coalitions, partnerships and strong working relationships with the following "CURE WASTE" Partners:

- City of Albany
- Iroquois Healthcare Consortium (IHC)
- Browning Ferris Industries (BFI)
- Resource Conservation Service (RCS)
- Baxter Healthcare Corporation
- Clean Harbors Company
The Medical Center's "CURE WASTE" Partners participate as active members of the Center's "CURE WASTE" Task Force. As members of the Medical Center's waste management team these "Partners" have added significant value to the "CURE WASTE" Program by providing the following benefits:

- Partners have resources
- Partners have expertise
- Partners value the Center as a customer
- Partners provide new and innovative opportunities
- Partners are also committed to the environment
- AMC can become more proactive
- AMC can participate in "models" and "pilots"
- AMC and Partners share in a "win-win" coalitions

The concept of partnerships with select vendors, service companies and local government has already paid significant dividends to the Medical Center. To date the Center and its "CURE WASTE" Partners have successfully developed and implemented the following collaborative initiatives:

- Browning-Ferris Industries, Iroquois Healthcare Consortium, Albany Medical Center and City of Albany collaborate to develop an environmentally sound, cost effective Regional Medical Waste Plan which has been nationally recognized for its value and applauded by state and local environmental and community groups.

- Baxter Healthcare Corporation, Albany Medical Center and the City of Albany organize and implement a community-wide program to recycle telephone books to be used in the manufacturing of patient care products used with Baxter's "Vernacare" technology. This unique collaborative venture provides the Center with a "first of its kind" opportunity to have its own waste and the waste from the community recycled and reused for the care of patients at the Medical Center.

- Browning-Ferris Industries and their recycling affiliate, Resource Conservation Service collaborate with the Albany Medical Center and the neighboring Town of Colonie to develop and implement New York State's first hospital based organic waste composting program. The significant "value added" program will give the Medical Center an opportunity to recycle an additional 800,000 pounds of waste each year.
Baxter Healthcare Corporation has selected the Albany Medical Center, as one of five pilot programs in the United States, to develop and test Baxter's IV Products Plastics Recycling Program. This program, which compliments the Center's EPA Grant Project, gives the Center the opportunity to source separate and recycle non-infectious patient care waste previously managed as medical waste.

Browning-Ferris Industries through their partnership with the Albany Medical Center have provided the Center with a quality, cost effective plan to "bundle" and consolidate all its waste service needs including recycling. This full service approach, which excludes hazardous and radioactive wastes, has made BFI more responsive to the Medical Center in developing attractive solutions to the Center's waste problems. This "bundling" of services has made it easy for the Center to shift its waste stream from medical waste or solid waste to recyclables as the Center's source separation and recycling program grows.

Baxter Healthcare Corporation and their Packaging Task Force established an on-going liaison and working relationship with the Medical Center to reduce the Center's waste stream through effective product management. This partnership will provide Baxter and the Medical Center with opportunities to evaluate patient care and clinical products and to develop and test waste efficient changes and/or innovations in products, containers and packaging.

Clean Harbors Company, Iroquois Healthcare Consortium and the Albany Medical Center collaborate to develop and implement the Regional Hazardous Waste Plan. Clean Harbors has also worked with the Medical Center to develop and implement waste reduction "action steps" to minimize waste volumes and/or reduce toxicity of the Center's hazardous wastes.

**The Multi-Strategy Approach**

The "CURE WASTE" Program is generally directed by aggressive waste management goals and objectives which are updated annually to provide a program with a cutting edge philosophy focused on the "hottest" and most contemporary issues. The Program is "multi-strategy" in nature with a sizable list of "action steps
and objectives that deals with a variety of waste related issues including waste reduction, recycling, product management, product reuse, toxicity reduction, etc. The multi-strategy approach also provides an opportunity to involve a greater number of employees and staff in the "CURE WASTE" activities and the associated detailed development and implementation of each strategy. This increased participation also promotes "ownership" in the program and an increased desire to succeed.

Program Goals and Objectives

As indicated above the "CURE WASTE" Program is directed by a number of aggressive goals and objectives focused on a variety of issues. The nature of the Center and the complexity of its waste stream and the associated regulatory requirements could easily bury the "CURE WASTE" Program and render it ineffective. To avoid this pitfall the "CURE WASTE" Program has intentionally been developed and built upon a foundation of simple and clear goals and objectives using a simple and effective blueprint. These goals and objectives have changed and grown with the success of the Program, however, they still remain simple in concept as they guide the day to day working activities of the program. The use of clear objectives keeps the Medical Center, its people and its "CURE WASTE" Partners on a common path. The use of important, yet simple objectives, also make early success easier. Success, which in turn, provides the confidence, motivation, pride and desire to achieve more.

The summary of the 1992 Program Objectives is provided below to demonstrate the general direction used during the past year.

- Expand recycling program to reduce total waste stream by recycling 750,000 pounds per year by January 1, 1993.
- Conduct annual review of all aspects of the Center’s waste management program. Prepare annual report to the Board of Directors.
- Develop and Implement comprehensive plan and procedures for source separation including patient care areas. Reduce medical waste stream by 200,000 pounds per year.
- Develop and implement a plan for "interim" on-site storage of low level radioactive waste.
- Expand recycling program to include separation of kitchen and food waste. Reduce kitchen waste stream by 90,000 pounds per year.
. Establish subcommittee to develop and implement Center wide office paper recycling program and to increase use of recycled paper products.

. Expand use of Baxter "Vernacare" technology. Increase use of recycled products.

. Recycle Medical Center phone books for manufacture of "Vernacare" products.

. Increase coordination between Cure Waste Task Force and the Value Analysis Committee. Increase purchase and use of recycled material.

. Develop and present Center wide education program to promote recycling, product reuse and waste reduction.

. Develop and implement Center wide source separation program to increase collection of recyclables, including separation of organic materials for compost program.

. Complete installation of new cafeteria dishwasher. Increase use of reusable cafeteria ware. Reduce waste of disposables by 30,000 pounds per year.

. Complete construction of waste processing and recycling center.

. Require that all major product vendors submit evidence of their commitment to waste reduction through more efficient product packaging.

. Conduct a comprehensive waste audit to update the Center’s waste management data base.

. Develop and implement plan for management and disposal of confidential records.

. Conduct comprehensive analysis of major inventory, supplies and materials used by the Center. Assess material content and packaging to identify opportunities for waste reduction, source separation of medical waste and recyclables.

. Develop and implement program to source separate batteries. Where appropriate implement recycling program. Where required manage hazardous wastes in accordance with Center policies.

. Reduce disposal of contaminated mercury. Implement program to increase processing and recycling of mercury.
The "Product Management" Concept

The Medical Center, in its efforts to expand its on-going efforts for waste reduction, source separation, and recycling has identified a significant relationship between the Center's waste problems and its material management responsibilities, including product management, purchasing activities and the "Value Analysis" Process. This inter-relationship between waste management and product management is most evident in the patient care and clinical areas.

The Medical Center, having recognized the importance of this relationship has included "product management" as a basic waste management strategy. As a result the Medical Center, as an important part of its waste management plan, has established a close working relationship between the "CURE WASTE" Program and its "Value Analysis" Committee. This teamwork approach has married the Center's material management and waste management activities with common objectives and a shared pride in the program's success.

The Community Service Approach

The mission of the Albany Medical Center, as an institution, underscores the Center's single purpose: to serve the community. The "CURE WASTE" Program is designed to compliment this mission by developing, implementing and maintaining a comprehensive waste management program that cares for, respects and protects the environment of the community. As a result commitment to serve the community has been incorporated into the Center's waste management activities.

The Medical Center has used its success in its own waste management program and its "CURE WASTE" Partnerships to provide service and bring benefit to the community. As indicated previously the Medical Center in coalition with the City of Albany and Baxter Healthcare developed a community wide program which recycled 69 tons of telephone books. The Medical Center's waste reduction and recycling program has also served the community in other important ways. The Center's "CURE WASTE" Program been closely coordinated with the City of Albany's overall mandated Waste Management Plan. The Medical Center's success, as the City's largest waste generator has helped the City meet it's recycling mandates and the objectives of its waste management plan. The Medical Center's success has also reduced the demand for landfill capacity, eased the City's waste disposal burdens and provided some relief to one of the community's most pressing environmental problems.
The Medical Center in cooperation with the Chamber of Commerce and WNYT, a local television station, co-sponsored and presented two (2) "Environmental Forums" to assist the region's small businesses in the development and implementation of programs to reduce waste, purchase smart and recycle. The Medical Center is also assisting the Chamber of Commerce in the development, publication and distribution of a recycling handbook for small businesses in the region.

This community service component of the Medical Center's "CURE WASTE" Program has also become an on-going aspect of the Center's public relation program and its marketing efforts. Many healthcare facilities in the country are struggling to protect their public image from the negative press and public criticism of their waste management practices. The success at the Albany Medical Center is proof that the image of a healthcare facility can be enhanced by a quality waste management program and a strong visible commitment to the environment.

The "CURE WASTE" Team

The concept of teamwork and the value of multi-disciplinary groups working for a common purpose is a familiar practice in the healthcare industry. The waste management program is among the many hospital activities that can be greatly enhanced by the application of "team" principles and the fundamental principles of "quality management".

The "CURE WASTE" Program at the Albany Medical Center has been and continues to be blessed with a dedicated, hard working team. The "CURE WASTE" Team at the Albany Medical Center is led by the members of the Center's "CURE WASTE" Task Force who are recognized as the "cheerleaders" for the program. The members of the Task Force are also responsible as the "captains" for the implementation of the Program in the respective departments of the Center. The major components of the "CURE WASTE" Team include the following:

- The "CURE WASTE" Task Force
- AMC "CURE WASTE" Partners
- Task Force Membership
- Task Force Responsibilities
- The "Value Analysis" Committee
- The People of the Medical Center
- Implementation and action oriented
The "CURE WASTE" Task Force

The "CURE WASTE" Task Force, as indicated above is a multi-disciplinary team focused on the quality management of the Medical Center’s waste management program. This Task Force is generally responsible for the following:

- Develop Program Objectives
- Monitor and Update the Plan
- Act as a Clearing House
- Contribute and Evaluate Ideas
- Review of Policies and Procedures
- Education and Training
- Communication and Promotion
- Works closely with "Value Analysis" Committee
- Conducts Annual Program Review
- Functions as "Quality Team"

Task Force Membership and Responsibilities

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<td>Other Interested Employees</td>
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Plant Management

- Overall responsibility for waste management
- Coordinates committee activities - acts as chair person
- Functions as the committee’s "designated driver"
- Responsible for all financial aspects
- Manages and operates waste processing and recycling facility
- Represents AMC on local, regional, state and national level
- On-going assessments of new technologies and systems
- On-going assessments of regulatory changes
Materiel Management

- Overall responsibility for Value Analysis Committee
- Overall responsibility for purchasing of products
- Monitoring of product utilization
- Assessment of reusables versus disposables
- Responsible for "stockless inventory"
- Responsible for vendor contracts and vendor commitment to waste reduction and efficient packaging
- Program coordinator for "Vernacare" waste reduction program

Environmental Services

- Waste collection and transportation
- Police quality of collected materials
- Monitors source separation program

Nutrition Services

- Monitors use of reusable/disposable cafeteria ware
- Identify, separate, and collect recyclables
- Separates kitchen and food waste stream for compost
- Reduced use of disposable cafeteria ware

Nursing Services

- First level implementation
- Source separation in patient care areas
- Hazard management
- Reduced use of disposable diapers
- Oversees source separation program in patient care areas
- Polices Baxter IV products recycling program

The People Of The Medical Center

The Center's ability to reduce its waste stream by over 2.4 million pounds is no accident. This success belongs very much to the people of the Medical Center. The support of the Center's employee population and their readiness to participate in the "CURE WASTE" Program has been the program's biggest surprise and greatest success. As citizens of the community the people of the Medical Center have become recyclers at home as each local government in New York State develop their own program. As employees of the Medical Center they bring their attitudes and their home recycling experiences to the workplace. These attitudes and experiences are a valuable asset to the "CURE WASTE" Team.
The "CURE WASTE" Process

The success of the Program, as indicated earlier, is not as accident. The "CURE WASTE" Program has a well developed Plan and a highly motivated and focus Team. These factors contribute to the success of the Program, however, that success is also the outcome of a process that works. The "CURE WASTE" Process at the Albany Center includes the following components:

- Comprehensive Waste Assessment Process
- Product Management and Value Analysis
- The EPA Waste Reduction Grant Project
- Multi-strategy Campaign
- Internal "Action Steps" for Waste Reduction
- Internal "Action Steps" for Recycling
- Internal Marketing Plan
- COMMUNITY participation and Involvement
- Role of AMC "CURE WASTE" Partners
- Evaluation and Adjustment
- New Objectives each year

The Center's Waste Assessment Process

The "CURE WASTE" Program, like any management program must continually reflect the needs of the program and the facility. The Medical Center recognizes that competent program decisions require good management information. The Medical Center also recognizes that this demand for information exceeds the scope of a traditional "waste audit". As a result the "CURE WASTE" Program has developed a guideline for conducting a comprehensive waste assessment to determine the Program's needs for people, systems, technology, facilities and financial resources. This Waste Assessment Process at the Albany Medical Center includes the following:

- Determine existing conditions with respect to waste generation and waste management
- Determine facility regulatory compliance
- Identify, characterize and quantify waste streams from each department and area of the facility
- Identify volume and nature of products purchased and used by each department and area of the facility
- Identify volume and nature of reusables and disposables used by each department and area of the facility
- Identify volume, nature and classification of all recyclable wastes
. Identify and evaluate existing collection, internal transportation and disposal methods
. Identify and evaluate alternative methods for collection, transportation and disposal of various waste streams
. Provides information to design "system" and "flow pattern" for source separation, collection, transportation and on-site storage of recyclables
. Analyze the cost and financial implications of various waste management options including avoided costs
. Provides basis for waste minimization decisions and implementation of opportunities for recycling, product reuse and waste reduction
. Provides basis for development and implementation of waste treatment and disposal technologies

Product Management as a Waste Management Process

As previously indicated the Medical Center, has identified a significant relationship between its waste management program and its material management activities. The Center, having recognized the importance of this relationship has included "product management" as a basic waste management strategy. The material management activities included in this strategy include product management, purchasing and the "Value Analysis" Committee.

The waste assessments conducted by the Medical Center clearly indicate that the inter-relationship between waste management and product management is most evident and most significant in the patient care and clinical areas. This direct relationship between waste management and product management is especially important to the Center's ability to meet its highest priority waste management objective for 1992. This specific objective, to develop and implement an effective plan for source separation and waste reduction in patient care and clinical areas, is vital to the Center's ability to further reduce the waste stream, expand the recycling program and reduce the cost of waste treatment and disposal.

The EPA Waste Reduction Grant Project

The Medical Center's desire to develop and implement an effective source separation and waste reduction program in the
patient care and clinical areas is limited by the world’s perception of medical waste and its hazards and the absence of available information and technical guidelines to assist the Center in this effort. The need for this information to guide the development and implementation of the "CURE WASTE" Program in the patient care and clinical areas led to the Medical Center's application for and subsequent award of a Waste Reduction Grant from EPA for the development of a "Model Program for Waste Reduction in Clinical and Patient Care Areas".

This model, which places significant emphasis on product management, is based on the premise that effective waste management begins when products are specified, and purchased. The model developed and published with the EPA grant focuses on the following product management issues and their impact on the "CURE WASTE" Program:

Analyze the medical and surgical products used at the Medical Center to identify, classify and evaluate the waste characteristics of the product and its packaging.

Evaluate the "cradle to grave" flow, distribution, use and eventual disposal of the product and its packaging from the warehouse to the patient care area to identify opportunities for precycling and source separation.

Evaluate operational factors associated with source separation issues, including labor, space, equipment, containers, costs, etc.

Identify specific products, packaging, material management procedures and/or waste management practices which result in unnecessary waste or significantly limit or prevent source separation opportunities.

Develop standards for more waste efficient products, containers and packaging.

Implement "pilot programs" with major product manufacturers and suppliers to develop and test waste efficient changes and/or innovations in products, containers and packaging.
Conduct on-going assessment of product use and product technology to determine feasibility of using "reusable" versus "disposable" products.

Establish policy that require that all major product vendors submit evidence of their commitment to waste reduction through more waste efficient product packaging.

The Medical Center, as part of the Grant Project, has agreed to develop a handbook with "How To" information and guidelines. This handbook will be made available to AHA, JCAHO and other associations for publication and distribution.

The "Action Oriented" Process

The concepts of waste reduction, product re-use and recycling are achievable goals in every healthcare facility. However, these goals will only be reached with an effective game plan and the right waste management strategies. The Albany Medical Center and it’s multi-strategy approach has identified a number of "action steps" which have become part of the Center’s day to day activities. These "action steps" include, but are not limited to, the work practices listed below.

"Action Steps" for Waste Reduction

Develop and implement "source separation" guidelines in patient care areas

Develop close working relationship between the Waste Committee and the Value Analysis Committee to enhance and coordinate the environment assessment of products, systems and technologies

Develop "Standard Guidelines" to be used when evaluating products, product packaging and product waste characteristics

Develop and maintain strong working relationships with model systems and product manufacturers to establish effective partnerships aimed at fostering new concepts and ideas for reducing waste.
Encourage the development and implementation of "Pilot Programs" or "Trial Programs" to try out and test new systems, products, technologies and operating procedures.

Develop policies that encourage and/or require that both sides of paper be used when printing and copying.

Develop procedures to circulate information whenever possible to reduce the use of paper copies. Use electronic mail whenever possible.

"Action Steps" For Product Reuse

Develop and implement "Evaluation Guidelines" for assessing and determining the value of using "reusables" versus disposables.

Develop program and price discounting to increase use of reusable cafeteria ware, including reusable "CURE WASTE" coffee mugs.

Develop guidelines to assist users in the purchasing of products and equipment that are durable, easily repaired and/or recyclable.

"Action Steps" for Recycling

Each recyclable material must be listed, described and identified.

Each recyclable material must be segregated and collected.

Demonstrate how recyclables are to be separated.

Procedure must define who will separate material and who will collect materials.

Procedure must define who will conduct staff training.

Special consideration should be given to recycling containers.
Recycling Containers

Type, size, color and location of containers
Volume, weight and durability of container
Number and cost of container
Space required to store containers
Should not look like garbage cans
Located for easy and convenient access and use
Clearly labeled and identified
Located near copiers, printers, vending machines, etc.
Size and material in patient care areas may be restricted (fire safety)

The Internal Marketing Plan

Designed to educate, communicate and inform
Announce program to staff and employees in a positive manner
Goals, objectives and advantages of program must be clearly communicated
Designed to encourage participation, cooperation and enthusiasm
Establish a program logo or campaign slogan
Use newsletters, facility newspaper, posters, buttons, etc.
Be innovative and creative - not expensive
Prepare written program policies and procedures
Provide "how to" instructional information
Prepare and distribute waste management handbook
Establish exact dates for implementation of program
Schedule in-service training for specific departments
Schedule Center-wide orientation program with high visibility
Seek voluntary compliance - avoid mandates
The "CURE WASTE" Results

The results which measure the value and success of any management program are even more significant in the waste management arena. The waste management program must have "staying power" if it is to become part of the facility's culture. This "staying power" is also fundamental to the long term life of the program and its future value as waste disposal and landfill cost increase. At the Albany Medical Center the early and continued results of the program and its success as summarized below are providing the "staying power" and desire to take the program to a higher level.

The General Results

Reduced waste stream by 2.4 million pounds (over 2 yrs.)
Abandoned on-site incinerators
Eliminated disposal of 800,000 pounds of ash
Avoided $1.5 million capital expenditure
Converted old incinerator building to recycling facility
Developed regional medical waste plan
Developed regional hazardous waste plan
Reduced or avoided $280,000 in operating costs (over 2 yrs)
"Cure Waste" program incorporated into the Center's Community Service Plan
Developed "product oriented" approach to waste management
Established coalitions with "Cure Waste" partners

The Waste Reduction Results

Implemented Baxter "Vernacare" system (20,000 pounds)
Reduced use of disposable medical waste containers
Working with Baxter packaging task force to reduce product packaging
Installed new cafeteria dishwasher

Implemented "product oriented" source separating program in patient care and clinical areas

Received waste reduction grant from EPA to develop model program for patient care and clinical areas

**The Product Re-Use Results**

Reduced waste stream by 500,000 pounds

Implemented reusable diaper program (43,970 pounds)

Implemented plan to reuse cafeteria ware (30,100 pounds)

Implemented use of reusable medical waste containers (344,925 pounds)

Implemented program to refill and reuse laser printer cartridges

Expanded use of recycled products

**The Recycling Results**

Recycled 1.8 million pounds of wastes

Implemented community-wide phone book recycling program

Constructed on-site material recovery and recycling facility

Implemented Baxter IV products plastics recycling program

Implemented plan to recycle PCB ballasts

Implemented plan for composting of organic wastes including kitchen and food wastes
## The Recycling Summary

<table>
<thead>
<tr>
<th>Item</th>
<th>1991</th>
<th>1992</th>
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<tbody>
<tr>
<td>Green Bar Paper</td>
<td>24,140 Pounds</td>
<td>38,160 Pounds</td>
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<tr>
<td>Colored Office Paper</td>
<td>12,673 Pounds</td>
<td>4,050 Pounds</td>
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<tr>
<td>Cardboard</td>
<td>333,060 Pounds</td>
<td>388,470 Pounds</td>
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<tr>
<td>Glass</td>
<td>4,100 Pounds</td>
<td>7,850 Pounds</td>
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<tr>
<td>Tin Cans</td>
<td>24,880 Pounds</td>
<td>48,220 Pounds</td>
</tr>
<tr>
<td>Scrap Metal</td>
<td>95,795 Pounds</td>
<td>257,580 Pounds</td>
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<tr>
<td>White Office Paper</td>
<td>45,319 Pounds</td>
<td>96,720 Pounds</td>
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<td>IBM Cards</td>
<td>1,763 Pounds</td>
<td>1,050 Pounds</td>
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<td>Pallets</td>
<td>3,200 Pounds</td>
<td>15,000 Pounds</td>
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<tr>
<td>Magazines</td>
<td>-</td>
<td>10,200 Pounds</td>
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<tr>
<td>Shrink Wrap</td>
<td>600 Pounds</td>
<td>-</td>
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<tr>
<td>Compost</td>
<td>-</td>
<td>210,000 Pounds*</td>
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<tr>
<td>IV Plastics</td>
<td>-</td>
<td>16,600 Pounds</td>
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<tr>
<td>Contaminated Soil</td>
<td>183,660 Pounds</td>
<td>-</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>729,190 Pounds</strong></td>
<td><strong>1,093,900 Pounds</strong></td>
</tr>
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</table>

* Three month total - October 1 - December 31, 1992
The Albany Medical Center Conclusion

The comprehensive, proactive approach to waste management and the associated management of products at the Albany Medical Center has provided the Medical Center with a cost effective, environmentally sound program for reducing the Center's waste stream while at the same time providing many unexpected "value added" opportunities not considered in the original program design, development and implementation. The "CURE WASTE" program at Albany Medical Center and its many successes and positive results is proof that effective and comprehensive waste management is also sound institutional policy, wise financial practice, good public relations and an excellent example of total quality management.
"Cure Waste": One Hospital's Formula For Success

A Product Oriented Model
For
Managing The Patient Care Waste Stream

Waste Reduction
Product Management
Value Analysis
Tools and Systems
Product Suppliers As a Partner

A product oriented waste reduction model developed by The Albany Medical Center, Albany, New York in cooperation with EPA and the Healthcare Resource Conservation Coalition

November 1994
MANAGING THE PATIENT CARE WASTE STREAM

INTRODUCTION

The Healthcare Resource Conservation Coalition (HRCC) recognizes the need for and value of developing and implementing of a waste management program that addresses the environmental impact and waste cost associated with the care and treatment of patients. The HRCC further recognizes that managing the patient care waste stream requires tools and systems that are different than the "conventional" waste management and recycling programs developed in other non-clinical areas of the hospital.

In view of the above, the HRCC proposes to assist hospitals in the development of these patient-oriented waste management programs by providing a "model" of the tools and systems which can be used and applied to this objective. The HRCC has reviewed the model developed by the Albany Medical Center, Albany, New York and endorsed this model as one approach that has proven most successful as managing and reducing the patient care waste stream. This model developed by the Albany Medical Center as part of their "CURE WASTE" program is also the subject of an EPA Waste Reduction Grant awarded to Albany Medical to develop a model Waste Reduction Program in Patient Care areas.
Product Management As A Waste Management Process:

The waste assessments conducted by Albany Medical Center indicated that the inter-relationship between waste management and product management was most evident and most significant in the patient care and clinical areas. This direct relationship between waste management and product management is especially important to the Center's ability to develop and implement an effective plan for source separation and waste reduction in patient care and clinical areas. The source separation of patient care waste is also to the Center's ability to further reduce the waste stream, expand the recycling program and reduce the cost of waste treatment and disposal.

The Albany Medical Center in its preliminary evaluation of the factors that impact waste management in patient care clinical areas has identified a significant relationship between its waste management program and its material management activities. The Center, having recognized the importance of this relationship has included "product management" as a basic waste management strategy which must be included in a patient oriented waste management plan. The material management, purchasing, and the "Value Analysis" process.

The Product Management Approach

The Albany Medical Center, as the result of its experience with the early phase of the "Cure Waste" Program learned that effective waste management begins when products are specified, purchased, stored, and distributed. The Medical Center believes that this is especially true in the case of medical and surgical supplies. As a result, the Albany Medical Center has developed a "Material Management" approach to the management of their waste. This approach, which analyzes the Medical Center's product and material management practices, includes the following:

- Analyze the medical and surgical products used at the Medical Center to identify, classify, and evaluate the waste characteristics of the product and its packaging.
- Evaluate the "cradle to grave" flow, distribution, use, and eventual disposal of the product and its packaging from the warehouse to the patient care area to identify opportunities for pre-cycling and source separation.
- Evaluate operational factors associated with source separation issues, including labor, space, equipment, containers, costs, etc.
- Identify specific products, packaging, material management procedures, and/or waste management practices which result in unnecessary waste or significantly limit or prevent source separation opportunities.
- Develop proposed standards for more waste efficient products, containers, and packaging.
- Develop proposed standards for more waste efficient products, containers and packaging.
- Develop proposed policies and procedures for pre-cycling and source separation.
- Implement "Pilot Program" with major product manufacturers and suppliers to develop and test product, container, and/or packaging changes.
The "Value Analysis" Process

The Medical Center's view that effective waste management begins with effective material management became a perfect compliment to the Medical Center's aggressive "value analysis" process. This process, which involves the on-going review and evaluation of the Center's products for value, cost, quality, safety, and effectiveness, now includes an evaluation and review of a product's waste characteristics. The Medical Center's Value Analysis committee and its "Cure Waste" Task Force now work in close harmony in an effort to seek and effect change in products and packaging. The marriage of the Center's waste management, value analysis, and product management activities include the following activities:

- Conduct on-going assessment of product use and product technology to determine feasibility of using "reusable" versus "disposable" products.
- Establish policy that requires that all major medical and surgical product vendors submit evidence of their commitment to waste management through more efficient product packaging.
- Implement "pilot program" with major product manufacturers and suppliers to develop waste efficient changes and/or innovations in products, containers, and/or packaging.

Attached to this model as Appendix I is a sample of the typical waste management related initiatives of the Albany Medical Center Value Analysis Committee.

The Source Separation Effort

Prior to implementing its "CURE WASTE" Program, the Albany Medical Center, like many hospital's throughout the United States, used an ultra-conservative, overly cautious approach to managing the waste generated in its patient care areas. Prior to July 1, 1991 AMC burned all its patient care wastes (excluding hazardous and radioactive wastes) in an incinerator with a heat recovery boiler. As a result the Medical Center benefited from the general practice of commingling solid wastes with regulatory medical wastes. Since everything was burned it was easy and economical to treat all wastes generated in patient care areas as Regulated Medical Wastes. This practice also avoided the need to segregate and source separate solid waste and keep it away from the regulated medical waste. However, the value of this practice came upon close scrutiny when the Albany Medical Center decided to close down its incinerators and strengthen its commitment to environmental quality and the community.
Tools and Systems

This section of the model will more fully describe the tools and systems that have been developed by AMC to address the needs and requirements of a patient oriented waste management. These tools and systems have been developed to integrate easily in the every day life of a busy health care facility.

The management tools and systems developed and/or adopted by AMC for managing the patient care waste stream include the following:

- Integration of Product Management and Waste Management
- Product oriented waste audit
- Addition of a waste assessment in the "Value Analysis" process
- Source Separation Process in the Patient Care Areas
- Development of "Material Waste Data Sheet"
- Guidelines for environmental assessment of supplies and manufacturers

Each of the tools identified above, alone and as part of an integrated system, has played an important role in the ability of AMC to successfully meet and exceed its goal to expand its "CURE WASTE" Program into the Patient Care areas.

Why A Product Management Approach?

Hospital's can develop and successfully implement recycling programs using a conventional approach. An approach which will recycle items such as cardboard, paper, glass, tin, plastics, etc. generated by the support and administrative function of a hospital. In this regard hospitals can model these conventional recycling program after hotels, restaurant, office buildings, etc. These programs when highly successful can result in the recycling of up to thirty (30) percent of the hospital's waste stream. These conventional recycling programs have been implemented at many hospitals through the nation, however, in most cases these conventional programs do not focus in the wastes generated by the care and treatment of patients.

Managing the patient care waste stream and the willingness to take the waste management program to the next level requires that a hospital take a closer look at the characteristics and nature of these waste stream. These waste streams will include most of the items included in the conventional waste stream, however, such items frequently cannot be recycled because they are not source separated and become commingled with regulate medical waste. In addition a close look at the patient care waste stream will also reveal waste that is unique to the patient care and clinical. This unique waste is the by-product of the many medical and clinical products used for the care and treatment. These products normally are provided with substantial packaging which only increases the waste stream.

The "cradle to grave" approach has been proven successful in the management of other waste streams and should be applied to patient care wastes. When looking at the "cradle to grave" concept for patient care waste, a hospital must begin to look at the life of the products that it uses. Since this life begins when the product is specified and purchased it must include "purchasing" as an associated process. In fact if you follow the product during its life at the hospital you will spend more of that time involved in the material management activities of the hospital. To evaluate the waste management problems and needs of a patient care area you will find yourself drawn into the hospital's product management system.
The "Product Audit" As A Waste Management Tool

One of the most valuable elements of a product management approach to the managing of the patient care waste stream is the "Product Oriented Waste Audit". An audit process which is centered on "identifying the problem" through a product focused waste management walk-thru audit of the facility. This product focused process is a significant deviation from what is considered a conventional "waste audit".

The basic premise of product oriented waste management recognizes that "Waste Management" begins when products are specified and purchased. As a result the application of some basic material management concepts can reduce the volume of waste generated and the disposal cost associated with such wastes.

Why Do Product Oriented Waste Audit?

From the warehouse to the patient floor, trash cans and red bag containers overflow with material that is in large part packaging. Healthcare facilities and their buying habits are a packaging engineer's dream and a waste management nightmare. As healthcare practices have evolved in the last two decades to emphasize sterility, infection control, and convenience the size and amount of packaging, and the number of options for disposables has grown exponentially. In this field there has been no design for waste management. Given that most hospitals had incinerators and could treat waste on site, there did not seem to be the need.

Now as hospitals see their cost of disposal rise at a steep rate, and in some cases have their ability to dispose of infectious waste threatened altogether, a new consciousness of waste frugality is emerging. A simple visual examination of most trash containers and red bags at most hospitals will demonstrate that packaging in all its forms (paper, plastic, glass, foil, and metal) is a very large, if not the largest component of the waste stream.

Very successful efforts at some hospitals have managed to segregate waste so that there is minimum impact from packaging on the red bag waste stream. In a few model programs, much of that waste is being recycled. In these cases however the emphasis has been on the back door--catching the waste when it is being disposed of and setting up systems to deal with it in its vast quantity.

There is another approach—that of closing the front door to as much unnecessary packaging as possible.

The product oriented waste audit is a waste management processes which can and must be integrated into the existing systems and process in the hospital. As a result the product oriented waste audit must be a process which works simply and conveniently, with the day-to-day operations of the hospital. In this regard the product oriented waste audit must look at the things that happen to products each day and do so in a manner which does not disturb or interrupt the activity of the hospital.
The Audit Team

An effective product oriented waste audit is best performed by an audit team which can recognize and identify the patient care and clinical product and the following characteristics of the product:

- How is it purchased, stored, distributed, and managed?
- How is it handled and used by the clinical staff?
- How is it handled, transported, and managed as a waste?

The product characteristics noted above clearly suggest the need to use a "hospital smart" audit team which is familiar with these characteristics. As a result using auditors from waste service companies and waste management consultants which have no hospital experience may produce unsatisfactory results. In addition, such audits by outsiders do not promote "ownership" in the process and usually do not become an "on-going" product management activity.

As indicated above, hospitals and their waste stream are some what unique and therefore it is best to develop a "Product Waste Audit Team" which is "hospital smart". At the Albany Medical Center this Audit Team consisted of the following:

- A purchasing agent to evaluate the purchasing and material management issues
- A staff nurse or clinical supervisor to evaluate the clinical and patient care issues
- A waste manager to evaluate the waste management issues

In view of the above, the Albany Medical Center established an Audit Team consisting of three (3) members made up of its own hospital personnel. With pre-planning and education, this Audit Team proved that it was better qualified to conduct a waste audit than any other "expert." As a result the audit to be discussed in this section is based on a three person team: staff from materials management, waste management, and a clinical area. Each hospital should evaluate its own needs to determine the composition of its Audit Team. The third clinical team member could be the same person for a facility wide audit, or may be a rotating team member, with different people from different clinical areas joining the team as it moves around.

The Role of Material Management

As indicated in earlier sections of this report the Albany Medical Center and the philosophy for its "Cure Waste" Program is built on the premise that waste management is a by product of product management and as a result "Waste Management begins when products are specified and purchased".

The experience at the Albany Medical Center proved that the old adage "garbage in .... garbage out" applies to materials/waste management as well as to computers. The more "garbage in" thru receiving doors (i.e. unnecessary products, excessive packaging, excessive inventory, improper purchase quantities, etc.) the more "garbage out" for final disposal. The application of some basic purchasing and materials management standards can significantly reduce the volume of waste in, thru and out of your facility. A waste management plan that does not include the involvement of purchasing and materials management will most certainly fall short of its goals as it will focus on the result ..... rather than the source.
The Role of Material Management Cont'd:

A comprehensive purchasing focused waste management "walk thru audit" of your facility is a great first step in developing a product oriented waste management plan. The waste management walk thru should include visits to the warehouse, central distribution, various departments where products are processed and used, and the waste disposal areas. These departments are normally part of the material management functions and as a result during the tour you need to carefully consider key areas in the cradle to grave (shipping dock to final disposal) product audit.

Materials Management can fulfill its responsibilities in reducing a facility’s waste stream by:

- Expressing concerns raised by the audit in writing to departments in question, and to suppliers
- Challenging the ongoing need for major products or product categories in a collaborative manner with various departments
- Considering the cradle to grave impacts of products and packaging
- Identifying specific products, packaging, and suppliers as part of a waste reduction inventory
- Developing product packaging specifications
- Requesting reusable totes for delivery of those products that are appropriate
- Requesting material identification sheets on products and packaging for recycling
- Working with the end users to develop standards for more effective and waste efficient products, packaging, and services
- Enlisting key suppliers as partners to create innovative products, packaging, and delivery systems that serve to diminish the garbage in... garbage out dilemma for your facility. Your purchasing dollars are a powerful tool and speak a language to which even the most indisposed supplier must listen
- Requiring that major vendors prepare and submit an Environmental Assessment Statement to describe and document the vendors (manufacturers) commitment to the environment, including waste reduction
- Provide for an aggressive "Value Analysis" process which incorporates waste management as one of the important criteria used in product evaluators and purchasing decisions

Planning the Product Audit

A product focused waste audit will start you at the front door and move you slowly to the back door with a series of specific steps to be taken or investigated to prevent waste from entering the hospital in the first place. Before beginning the audit a hospital should develop a plan which includes the following ingredients:

1. Follow the basic 80/20 rule. This is also known as the Pareto Principle which reasons that 80 percent of the waste problem is a result of 20 percent of the specific items that come into the hospital. One only has to observe the quantity of corrugated cardboard in the waste stream to begin to understand the accuracy of this rule. Prior to the walked thru review your most recent 80/20 inventory report - a model that identifies the 20 percent of the inventory that generate 80 percent of the waste. This report will help to establish product (and supplier) priorities which need a focus during your walk thru.
Plannin~

2. Recruit Colleagues, especially from environmental services, infection control, plant management, or whoever else is intimately involved in waste management, and key players in patient care, administration, and support service areas (e.g. nutritional services).

3. Plan your schedule. These audits are best done in stages and should become a part of your on-going routine. Regular auditing of waste management practices should become routine in order to address changing nature of products, distribution, and use which is a regular part of the hospital.

4. Consider the tools you will need. A hand held tape recorder is a useful tool. A utility knife and sealing tape for the warehouse tour is essential. Wear comfortable clothing - you may want protective gear for some areas. Safe shoes should be required—no open toes.

5. Take time to stop, look, and listen! Do not hurry the process. This should be a comprehensive, facility wide walk thru. Look at the packaging, the product, the delivery system, the inventories, the in-use practices, and current needs. Listen to the suppliers, the users, and most importantly the handlers (in distribution and waste management). You need to understand their concerns and needs in order to incorporate them into any new system you devise.

6. Think innovation .... but look to the past. History repeats itself. What made sense prior to our accepting a throw away society, just might make sense, save dollars, and solve problems today.

7. Benchmark .... Schedule visits to other organizations in your community, and with key suppliers. Seek out the solutions that others have developed. A health care institution is a mini-city, and the waste problems are complex.

8. Develop a process to inform departments and provide feedback along the waste????. The plan must "follow through" to be successful. Work with each department to first make sure that they understand the waste reduction objectives you have set and the rationale behind them. Make sure they understand the benefits that will occur as a result of work in this area, both to them directly and to the hospital. Ask for their help to establish product and packaging objectives that will better address the cradle to grave product management objectives based on your facilities needs. Take this feedback and bring it back to your major suppliers to solicit their cooperation to accomplish your cost and environmental objectives.
The Product Audit Process

The Audit itself is a fairly simple procedure. Mostly it involves walking around, being observant, asking questions, listening, and looking at trash or potential trash. What is important is that it be done systematically, and that clear and accurate records be maintained for later analysis and the building of recommendations.

Attached as Appendix II are the results of a typical product audit at the Albany Medical Center.

When conducting a product oriented waste management walk-thru the following steps will increase the effectiveness and value of the product audit:

1. Establish Clear Objectives

   - identifying those products which will offer the greatest opportunities to reduce wastes through packaging or component adaptations
   - possibilities for cooperative working relationships with suppliers who need to be cultivated as allies in your "ware on waste".
   - identifying opportunities to remove packaging at the most immediate entry/distribution points within your institution
   - creating opportunities for better inventory control and distribution practices
   - finding opportunities to tie product quality review, purchasing, materials management, and waste management together in a new partnership
   - engaging clinical staff in problem solving around product use and packaging issues that could eliminate waste

2. Review the Issues

   The waste audit should be developed to look at a number of specific issues. These issues can best be represented by conducting an audit which will ask and hopefully answer the following questions:

   - Is there a continuing need for the product and/or its packaging?
   - Are the products/packaging the most cost effective and environmentally sound available?
   - Can functions/features be combined to reduce products without jeopardizing performance?
   - Can product/packaging be reduced without sacrificing functionality (i.e. does an item need to be double wrapped)?
What can be done to increase the in-use life cycle of products—evaluating the reuse of a product versus single use, e.g. investigating in-dwelling times of catheters, reviewing procedures that dictate usage times of a product such as IV caths, connection tubin, etc.

What can be done to eliminate excessive packaging and/or replace it with re-usable packaging or containers?

Can outer and secondary packaging be removed prior to distribution?

Do the purchase/use quantities seem realistic? Are quantities requested a guess or based on patient census or history? How often are these numbers checked and updated?

Are the inventories (including the informal inventories) being properly controlled?

What is done to control samples and "free goods"? At disposal time these items, with their very excessive packaging, are anything but free!

Are there signs of product abuse? Talk to the users to find why staff may be discarding what appears to be satisfactory product. If there is a reason to change product work with staff to find a more acceptable alternative.

What can be done to improve the logistical systems? When walking through the facility talk with the product movers (warehouse workers, distribution staff, waste handlers, etc.).

Investigate the utility rooms in patient care areas. Take a peek in the open disposal containers, observe the final disposal practices (including a visit to the land-fill).

What is being done with surplus equipment and supplies? There are numerous options available for the redistribution of unused supplies and old equipment in alternative settings.

3. Develop an "Action Plan"

Upon completion of your audit take your list of findings and develop a plan targeting specific materials, products, areas, and suppliers. Elements of a plan may include the following points taken from a typical hospital product waste audit:

- opening cartons in central supply and distributing products on carts to keep the cardboard off the floors
- contacting xyz supply company for information on what material their packaging is composed of
- requesting that doctors regularly update their inventory of customized pre-packaged surgical kits to reduce supply waste
- advocating that the group purchasing corporation that the hospital belongs, to sets packaging standards for certain materials
- contact your battery and equipment suppliers to see if they will take back spent batteries
- examine regulatory requirements that restrict reduction, reuse, or recycling opportunities, and challenge them if necessary
- request information on the environmental impact of disposal of certain types of materials or packaging from the vendor responsible for waste disposal (e.g. PVC in an incinerator; mercury in an autoclave; batteries in a landfill).

Each facet of the plan should be related to a "finding" from the audit. The plan components should be prioritized following the "80/20" rule.
The Supplier's "Environment Assessment"

All major manufacturers and suppliers which provide product to the hospital should submit a comprehensive statement and documentation of their corporate commitment to the environment including waste reduction. The hospital should have a clear list of environmental standards which it is seeking to apply to all purchases. This list should be shared with all suppliers, and a request should be made for voluntary compliance and cooperation with those standards. A supplier who wants to keep your business will listen to your concerns. Depending on the outcome of your waste audit you may find an opportunity to target one or two suppliers to work on solving some of the biggest waste problems. These approaches are best made as solicitations for partnerships.

The "Supplier's Environmental Assessment Statement" used at the Albany Medical Center includes the following issues:

1. State the vendor's environmental policies and demonstrate how these policies are supported by the company.
2. Establish procedures for evaluating product designs, packaging, and distribution practices ... and to continually seek new waste reduction alternatives.
4. Reduce heavy metals in inks, colorants, plastics, stabilizers, batteries and other toxic materials.
5. Provide non-hazardous alternatives to the hazardous materials being supplied.
6. Increase the use of recycled materials in their product or manufacturing process.
7. Use or develop materials which are easier to recycle or dispose of.
8. Ship in bulk with no, or minimal packaging?
9. Use returnable shipping containers?
10. Work as a partner to suggest changes in procedures, or products of use, that will help to eliminate problems identified in a cost effective manner?

Let your suppliers know that you will favor products which meet your waste reduction goals, and that changes in product packaging to meet those goals should not increase product prices. You should not have to pay a premium for environmental quality in product selection.
The Value Analysis process will raise a variety of questions and produce varying results depending upon the specific needs of each hospital.

The following summary list represents the typical conclusions and decisions made by the Value Analysis Committee at the Albany Medical Center as the result of its reviewing the waste characteristics and environmental impact of products, processes and systems used at AMC:

Process Decision:

- A major process decision was to change to "Event Related Sterilization". This eliminated out-dating, reprocessing, and re-sterilization of items. This resulted in significant savings in both time and materials.

- Established a TQM approach to in-use product decisions. A core team with representation from each using area is used to review product practices.

- Reviewed waste disposal bag use. Eliminated "red" bags whenever feasible. Red bags were assessed to assure a proper weight bag was supplied for the intended use (many 3 mil bags were replaced with 1.5 mil). Disposal practices were reviewed to insure that bags were filled to a reasonable capacity, when possible.

- Various areas were reviewed relative to the Baxter Verna Care product line. Short term stay areas were converted to Verna Care from plastic disposables, without adding to the total in-use cost.

- Supply carts were reviewed for changing practice needs. Safety pins, thumb forceps, diapers, kelly clamps, scissors, etc. were being maintained as sterile. It was decided that this practice could generally be discontinued.

- The CDC guidelines were applied to product use to determine the maximum safe use of disposable products. Procedures/products/practices were reviewed in relation to the practical "in-use" life cycle, rather than manufacturers suggested life cycle. (i.e. using a closed suction system for 48 hours, rather than the suggested 24 hours). This review should be applied for most in-dwelling products.
• Distribution and Inventory practices were reviewed. Units of issue were revised to the lowest denominator (each/package/box/case) that would satisfy current usage patterns. This allows for better use of storage facilities, offers better inventory control, reduces excess shipping packaging from floors, and helps to minimize outdated discards. (Examples: sporadically used IV solutions/tubing, spinal needles, latex free products, catheters, gloves, etc.).

• Evaluated products from a practical viewpoint, rather than from a narrow health related perspective. A specially designed sharps container for laboratory discards (cost - $18.00 each), was replaced with a 5 gallon "masonry joint compound" container (cost less than $5.00). The savings amounted to more than $50,000. annually.

Waste Reduction Decisions:

• Supported University Hospital Consortium by changing to dressing supplier on their group contract. Lower prices, better packaging, more absorbent products, and more power to influence supplier on waste management issues.

• B-D supplied a urine transfer device in kit form only. They were persuaded to sell specific individual components (they were doing so in the foreign markets.). The individual component is being purchased at a lesser cost, and the waste product has been reduced.

• Baxter/Pharmaseal worked with AMC to change three major use disposable trays. The results were decreased components, reduced packaging, and...... 10 to 15% lower pricing.

• Lemon and Glycerin swabs were eliminated. Toothpaste and tooth brushes are used instead.

• Eliminated patient kits. Individual components are available on a "as needed" basis.

• Company modified addressograph machines to eliminate waste of patient identification products.

• Changed to McGaw syringe pump system. Eliminated mini-bags and tubing and significantly reduced associated in-use costs.

• Changed from Betadine swabs to wipes, which resulted in less packaging and waste.

Recycling and Product Reuse Decisions

• Replaced regular mattresses with pressure relief mattresses, which eliminated the need for disposable overlays (also reduced the need for specialty beds).

• Switched to reusable underpads.

• Converted to reusable breast pumps.
- Substituted reusable diapers for disposables.
- Converting to recyclable sterilization wrappers.
- Reusable coffee cups are encouraged for staff.
- Disposable styrofoam coffee cups have been discontinued in patient care areas. Disposable, recyclable (compostable) paper cups are used instead.
- Copier toner and Laser printer cartridges are being recycled.
- Eliminated disposable blood pressure cuffs in Labor and Delivery.

APPENDIX I

ALBANY MEDICAL CENTER

TYPICAL PRODUCT AUDIT

The Product Audit process, like the Value Analysis Process, will raise a variety of questions and produce varying results depending upon the specific product and the institution's specific use of the product. The following summary represents a typical list of the type of observations and findings which are the outcome of a typical product audit at the Albany Medical Center.

The summary list presented below represents the typical observations and findings made during a product audit at the Albany Medical Center. The sample provided represents an audit of typical patient care products at the Medical Center. A portion of this audit was performed in conjunction with the Baxter Packaging Task Force.

Note: The Albany Medical Center wishes to thank and commend Baxter for their leadership in Environmental issues, Product and Package Design and for the opportunity to work closely with the Baxter Packaging Task Force in our joint effort to reduce hospital waste.
ALBANY MEDICAL CENTER

TYPICAL PRODUCT AUDIT

BAXTER:

Linen packaging needs to be re-examined. Products formerly were string tied into dozens. Presently a heavy plastic wrapped is being used.

SUGGESTION:

Eliminate unnecessary packaging by returning to string.

BAXTER/TRAVENOL:

These seems to be a general trend to over package, especially thru the use of corrugated segregation inserts.

SUGGESTION:

All packaging should be reviewed with a new focus on waste management practices to address the concerns of the 90's.

CATALOG 11445-020 COLD PACKS:

Outer cardboard container, with four inner cardboard dividers. Each cold pack is individually packaged.

SUGGESTION:

All packaging should be reviewed with a new focus on waste management practices to address the concerns of the 90's. Also a reusable (limited use) cold pack might be considered.

4452A SCRUB CARE:

Dispenser packaging limits the number of units which could be bulk packed.

SUGGESTION:

Return to a reusable wall dispenser, which could be refilled.

11446-010:

Cardboard outer, cardboard insert, and product is wrapped in individual plastic and product is not sterile.

SUGGESTION:

All packaging should be reviewed with a new focus on waste management practices to address the concerns of the 90's.

4305C:

Neonatal Lumbar Puncture Tray - What impact does coating on outer packaging have on recycling? Applies to all similar trays.

SUGGESTION:

All packaging should be reviewed with a new focus on waste management practices to address the concerns of the 90's.
TYPICAL PRODUCT AUDIT

Cont'd:

001255 - VENTI MASK:
Could product be packaged in paper, product information printed on paper wrap. This would apply to most Air Life Products.

SUGGESTION:
All packaging should be reviewed with a new focus on waste management practices to address the concerns of the 90's.

65651-530 - THIN WALL CANISTER:
Why the inner cardboard, and plastic wrap for containers? Also does thin-wall instability increase the chance of accidental exposure to body fluids by waste handlers.

SUGGESTION:
The product should be reviewed, from a OSHA standards viewpoint, relative to employee exposure due to accidental spillage from the thin wall flexibility. Packaging should also be re-examined as stated with other products.

43410-165 - VENT CIRCUIT:
Why is each wrapped individually, in addition to a large inner plastic bag? The product is not sterile. Many times unsterile product is wrapped in individual plastic bags. Is this necessary? (Example: airways are not wrapped, but a urinary leg bags are).

SUGGESTION:
All packaging should be reviewed with a new focus on waste management practices to address the concerns of the 90's.

N-6100 - CLEAR NON-CONDUCTIVE BULK TUBING -
Wrapped in plastic, in addition to a huge outer cardboard container. This seems excessive.

SUGGESTION:
All packaging should be reviewed with a new focus on waste management practices to address the concerns of the 90's.

K50L - EXTENSION TUBE -
Outer cardboard, white cardboard inner packaging, and products are then individually wrapped.

SUGGESTION:
All packaging should be reviewed with a new focus on waste management practices to address the concerns of the 90's.
ALBANY MEDICAL CENTER
PRODUCT FOCUSED WASTE MANAGEMENT MODEL

PRODUCT AUDITS
Analyze product and Material Management Practices by doing a "walk-around" audit.

- Identify & classify the waste management characteristics of major patient products including production packaging.
- Evaluate "cradle to grave" flow, distribution, and eventual disposal of the product and its packaging to identify opportunities for recycling and source separation.
- Evaluate operational factors associated with source separation, including labor.
- Identify specific products, packaging, material management practices and/or waste management practices which result in unnecessary waste or limits source separation.
- Referrals to Value Analysis Committee

VALUE ANALYSIS PROCESS
(Product Assessment and Review)
- Product cost.
- Cost associated with product use.
- Quality
- Safety and Risk Management
- Effectiveness
- Infection control
- Product reuse
- Waste assessment and environmental impact
- Product decisions

M.W.D.S.
(Material waste data sheet)
- Description of the product: primary, secondary and tertiary packaging.
- Volume and weight of product and packaging.
- Waste classification of packaging.
- Recycle content.
- Recycling composition statement.
- Biodegradable, organic content

Suppliers Environmental Impact Statement
Annual Supplier and User Product Review
MATERIAL WASTE DATA SHEET

PRODUCT: SURGEONS’ GLOVE - FOLDED STYLE

PRIMARY PACKAGE DESCRIPTION: FLEXIBLE SHALLOW DRAW BLISTER FILM WITH PEELABLE PRINTED PAPER COMPOSITE LID

COMPOSITION DETAIL:

A. PEELABLE LID COMPOSITE: % BY WT WEIGHT/UNIT = GRAMS
   PAPER
   LDPE ADHESIVE
   HDPE FILM
   EVA HEAT SEAL COAT

B. FLEXIBLE BLISTER FILM
   LDPE, EVA, Ionomer Blend
   100

DISPOSAL DETAIL:

LANDFILL
A. SAFELY LANDFILL: PAPER AND POLYMERS DO NOT POSE LEACHING CONCERNS. INKS DO NOT CONTAIN HEAVY METALS BEYOND CONEPC GUIDELINES. SEE COMPOSITION FOR MASS PER UNIT.

B. INERT COMPATIBLE POLYMER BLEND. NOT LEACHING CONCERN.

COMPOST
ONLY PAPER ELEMENT OF "A" WILL DEGRADE BY COMPOST

INCINERATION
A. NO SIGNIFICANT TOXIC COMBUSTION BY PRODUCTS KNOWN
   NO SIGNIFICANT ASH LEACHATES
   FUEL VALUE - K CAL/UNIT
   ASH VALUE - G/UNIT

B. NO SIGNIFICANT TOXIC COMBUSTION BY PRODUCTS KNOWN
   NO MEASURABLE ASH (CATALYST RESIDUE)
   FUEL VALUE - K CAL/UNIT
   ASH VALUE - G/UNIT

RECYCLE
A. PAPER IS 100% SOFTWOOD BLEACHED KRAFT VIRGIN FIBER

B. COMPATIBLE POLYMER BLEND MAY RECYCLE IN GENERAL LDPE STREAM OF

SECONDARY PACKAGE

TERTIARY PACKAGE
"Cure Waste": One Hospital's Formula For Success

PHASE II

Managing The Patient Care Waste Stream

Hazard Reduction
Waste Prevention
Product Management
Value Analysis
Partnerships and Coalitions
The Value of Composting

Presented At:
Healthcare Pollution Prevention Workshop
Sponsored By The Iowa Department
of Natural Resources
Des Moines, Iowa
December 6, 1994

Presented By:
Claude D. Rounds, P.E.
Vice President
Office of Plant Management
Albany Medical Center
Albany, New York
THE MISSION STATEMENT

"TO CARE FOR THE COMMUNITY BY DEVELOPING, IMPLEMENTING AND MAINTAINING A COMPREHENSIVE WASTE MANAGEMENT PROGRAM THAT CARES FOR, RESPECTS AND PROTECTS THE ENVIRONMENT OF THE COMMUNITY."
MANAGING PATIENT WASTES:
TAKING YOUR PROGRAM TO THE NEXT LEVEL

The development and implementation of effective plans and programs to reduce, source separate and recycle hospital wastes is among the most significant environmental challenges now facing the health care industry. In many states this challenge is powered by the need to meet mandatory recycling goals, some as high as forty (40) percent. For many hospitals the need to develop and implement these waste management programs represent a significant cost and a necessary evil associated with the care and treatment of patients. However, for other hospitals like the Albany Medical Center located in Albany, New York effective waste management programs have provided important opportunities for environmental quality, economic value, quality management and community service.

Many hospitals have successfully implemented "conventional" recycling programs similar to those found in hotels, restaurants and office buildings which recycle office paper, cardboard, glass, tin, etc. These programs and their success are important contributors to the hospital's overall waste management goals, however, such "conventional" programs in themselves may not be adequate to meet the new aggressive recycling mandates established by some states. These conventional programs offer excellent opportunities to promote environmental quality, however, such programs, in themselves, do not always guarantee significant savings.

In view of the above hospitals must develop and implement new "non-conventional" waste management strategies to meet these waste reduction mandates and the associated challenges. The large volume of waste generated at health care facilities is the by-product of a system that has developed the ability to provide the best and most advanced healthcare in the world, however, little attention has been given to the environmental side effects and waste costs associated with this care including significant amounts of medical waste, discarded packaging, corrugated boxes, plastic bottles, etc. As a result, there is a great need to develop and implement waste management strategies which include the waste generated by the care and treatment of patients.

The "Cure Waste Program"

In January 1991 the Albany Medical Center developed and implemented Phase I of its nationally recognized waste management program known as the "Cure Waste" Program. This Phase of the Medical Center's "Cure Waste" program was most successful with over 2.4 million pounds of waste reduced or recycled during the first two (2) years of the program. During the initial phase of the "Cure Waste" Program the Medical Center's waste management activities were built upon a multi-strategy approach to waste reduction, product reuse and recycling. The Center's recycling activities during this initial phase were limited to the typical "conventional" recycling programs in the support areas and administrative offices. The results of these "conventional" recycling programs produced a recycling rate of twenty-eight (28) percent. The twenty-eight percent recycling rate at the Medical Center, which exceeded the New York State
The Medial Center's recycling mandate of twenty-five (25) percent, did not include the waste stream generated by the patient care and clinical areas. The success of the Phase I waste management activities also saved the Medial Center $260,000. These initial savings were attributed primarily to product reuse and reduced medical waste costs achieved through the use of reusable medical waste containers.

The Patient Care Waste Stream

The success of Phase I of the "Cure Waste" Program provided the Medical Center with a clear understanding of the untapped potential still available by expanding the program into the patient care and clinical areas. Potential which could directly enhance environmental quality, economic value, quality management and community service. During the first phase of its waste management program the Albany Medical Center learned what was needed to foster and enhance the value of its waste management program and it had the experience and tested infrastructure of systems and people needed to expand the program. The Medical Center also recognized that any such program expansion beyond the conventional recycling processes must take aim at the medical and surgical products and supplies that make up a significant portion of the patient care/clinical waste stream. In this regard the Medical Center recognized that its program could only be expanded through more effective product management and the use of waste efficient products and packaging.

In its efforts to expand its waste management program into the patient care and clinical areas the Medical Center experienced great difficulty in its search for existing guidelines, working models, technical assistance, etc. The efforts of the Medical Center included conversations with government regulators, review of available literature and a survey of many individual experts in the hospital and waste management field. The Medical Center found that the successful development of programs in patient care and clinical areas had been limited by the public, regulatory and industry perspective that most patient generated waste is medical waste and therefore infectious and hazardous. In 1991 the Albany Medical Center, like many other hospitals, used an ultra-conservative approach to patient care waste management treating a significant portion of the solid waste generated in patient care areas as medical waste. This conservative approach directly affected the willingness and ability of the Medical Center and other hospitals to source separate, recycle and reduce the patient care waste stream. A waste stream, which in most cases includes general solid waste, such as packaging from health care products and supplies, that never come in contact with an infectious patient. The Medical Center believed that the availability of a practical waste management model that included waste reduction, source separation and recycling in patient care and clinical areas would be of great value to the hospital industry. Such programs would provide opportunities to reduce the volume of both medical wastes and solid wastes resulting in a reduction in the cost of off-site transportation, treatment and disposal. Hospitals with on-site incinerators would also benefit by smaller waste streams and a reduced amount of plastics and the associated air contaminants produced by the incineration of such plastics.
The Medical Center's search during 1992 for such information produced no single guideline or model that adequately addressed the following issues which the Medical Center believes must be addressed in a successful waste reduction program in a patient care or clinical setting:

- Effective infection control procedures
- Product management, waste efficient products and packaging
- Pre-cycling of packaging
- Source separation of medical waste and recyclable
- Proper management of solid waste
- Proper management of regulated medical waste
- Effective guidelines for clinical staff
- Effective "on-going" quality management
- Effective "on-going" communication and training
- Management commitment and leadership

The EPA Grant Proposal

The Medical Center recognized the importance of the above issues and the overall potential value of comprehensive waste reduction programs in the patient care and clinical setting. In the absence of models, guidelines and technical assistance from other sources the Medical Center decided to submit an application to the United States Environmental Protection Agency for a Waste Reduction Grant to develop a "Model Program for Waste Reduction in Clinical and Patient Care Areas". In October 1992 the Albany Medical Center was awarded a Grant from the EPA to develop such a model.

The Medical Center's project to develop a "Model Waste Reduction Program in Patient Care and Clinical Areas" was begun in October 1992 with the following specific objectives:

- Seek the input and guidance of other hospitals, major product manufacturers, waste service vendors, waste management consultants, material managers, government regulators and the Hospital Association of New York State in the design of the program model and to assure its universal application to other healthcare facilities.

- Develop working relationship with major product manufacturers to promote product changes to reduce the patient care waste stream by eliminating or reducing excessive packaging, eliminating obsolete products, increasing use of reusable or recyclable packaging and containers, etc.

- Develop a practical guideline for conducting an effective waste stream audit in patient care areas including the development of a Quality Management Audit Tool.
The Product Management Approach

The Medical Center, as the result of its experience with Phase I of the "Cure Waste" Program, learned that effective waste management begins when products are specified, purchased, stored and distributed. The Medical Center believes that this is especially true in the case of medical and surgical supplies. As a result, the Albany Medical Center has developed a "Material Management" approach to the management of their waste. This approach, which analyzes the Center's product and material management practices, includes the following:

- Analyze the medical and surgical products used at the Medical Center to identify, classify and evaluate the waste characteristics of the product and its packaging.
- Evaluate the "cradle to grave" flow, distribution, use and eventual disposal of the product and its packaging from the warehouse to the patient care area to identify opportunities for pre-cycling and source separation.
- Evaluate operational factors associated with source separation issues, including labor, space, equipment, containers, costs, etc.
- Identify specific products, packaging, materials management procedures and/or waste management practices which result in unnecessary waste or significantly limit or prevent source separation opportunities.
• Develop proposed standards for more waste efficient products, containers and packaging.
• Develop proposed policies and procedures for pre-cycling and source separation.
• Implement "Pilot programs" with major product manufacturers and suppliers to develop and test product, container and/or packaging changes.

The "Value Analysis" Process

The Medical Center's view that effective waste management begins with effective material management became a perfect compliment to the Medical Center's aggressive "value analysis" process. This process, which involves the on-going review and evaluation of the Center's products for value, cost, quality, safety and effectiveness, now includes an evaluation and review of a product's waste characteristics. The Medical Center's Value Analysis Committee and its "Cure Waste" Task Force now work in close harmony in an effort to seek and effect change in products and packaging. The marriage of the Center's waste management, value analysis and product management activities include the following activities:

• Conduct on-going assessment of product use and product technology to determine feasibility of using "reusable" versus "disposable" products.
• Establish a policy that requires that all major medical and surgical product vendors submit evidence of their commitment to waste management through more efficient product packaging.
• Implement "pilot programs" with major product manufacturers and suppliers to develop waste efficient changes and/or innovations in products, containers and/or packaging.

The Role of Partnerships and Coalitions

The Albany Medical Center, as a tertiary care hospital and academic health science facility, understands that it has limited financial resources and technical expertise in matters related to the management of waste. The Center also understands that it must work closely with local government, waste service companies and the manufacturers of healthcare products to affect change and develop, implement and financially support innovative approaches to both waste management and product management. In response to this need the Medical Center has established coalitions, partnerships and strong working relationships with the following "Cure Waste" Partners:

• City of Albany
• Iroquois Healthcare Consortium (IHC)
• Browning Ferris Industries (BFI)
• Resource Conservation Service (RCS)
• Baxter Healthcare Corporation
• Clean Harbors Company
• Health Resources Conservation Coalition (HRCC)

A few of these "Cure Waste" Partners participate as active member of the Center's "Cure Waste" Task Force. As members of the Medical Center's waste management team these "Partners" have added significant value to the "Cure Waste" Program by providing the following benefits:

• Partners have resources
• Partners have expertise
• Partners value the Center as customer
• Partners provide new and innovative opportunities
• Partners are also committed to the environment
• AMC can become more proactive
• AMC can participate in "models" and "pilots"
• AMC and Partners share in a "win-win" coalition

The concept of partnerships with select vendors, service companies and local government has already paid significant dividends to the Medical Center. To date the Center and its "Cure Waste" Partners have successfully developed and implemented the following collaborative initiatives:

• Browning-Ferris Industries, Iroquois Healthcare Consortium, Albany Medical Center and City of Albany collaborated to develop an environmentally sound, cost effective Regional Medical Waste Plan which has been nationally recognized for its value and applauded by state and local environmental and community groups.

• Baxter Healthcare Corporation, Albany Medical Center and the City of Albany organized and implemented a community-wide program to recycle telephone books to be used in the manufacturing of patient care products used with Baxter's "Vernacare" technology. This unique collaborative venture provides the Center with a "first of its kind" opportunity to have its own waste and the waste from the community recycled and reused for the care of patients at the Medical Center.

• Browning-Ferris Industries and their recycling affiliate, Resource Conservation Service collaborated with the Albany Medical Center and the neighboring Town of Colonie to develop and implement New York State's first hospital based organic waste composting program. The significant "value added" program provided the Medical Center an opportunity to recycle an additional one (1) million pounds of waste each year.
Baxter Healthcare Corporation has selected the Albany Medical Center, as one of five pilot programs in the United States, to develop and test Baxter's IV Products Plastics Recycling Program. This program, which compliments the Center's EPA Grant Project, gives the Center the opportunity to source separate and recycle non-infectious patient care waste previously managed as medical waste.

Browning-Ferris Industries, through their partnership with the Albany Medical Center, have provided the Center with a quality, cost effective plan to "bundle" and consolidate all its waste service needs including recycling. This full service approach, which excludes hazardous and radioactive waste, has made BFI more responsive to the Medical Center in developing attractive solutions to the Center's waste problems. This "bundling" of services has made it easy for the Center to shift its waste stream from medical waste or solid waste to recyclables as the Center's source separation and recycling program grows.

Baxter Healthcare Corporation and their Packaging Task Force established an ongoing liaison and working relationship with the Medical Center to reduce the Center's waste stream through effective product management. This partnership will provide Baxter and the Medical Center with an on-going opportunity to evaluate patient care and clinical products and to develop and test waste efficient changes and/or innovations in products, containers and packaging.

Clean Harbors Company, Iroquois Healthcare Consortium and the Albany Medical Center collaborated to develop and implement the Regional Hazardous Waste Plan. Clean Harbors has also worked with the Medical Center to develop and implement waste reduction "action steps" to minimize waste volumes and/or reduce toxicity of the Center's hazardous wastes.

The Albany Medical Center was selected as one of a select few hospitals in the United States to participate in a task force sponsored by the leading manufacturers of health care products. This Task Force, which is designed to bring hospital and product manufacturers, has subsequently lead to the formation of the Health Resources Conservation Coalition (HRCC) a unique "first-ever" assembly of two traditionally separate camps—the health care community and its suppliers. A coalition was formed for and committed to reducing and controlling medical waste.

**Composting As A Hospital Waste Management Alternative**

The source separation of the patient care waste stream at the Albany Medical Center also provided an opportunity to more effectively separate regulated medical waste from non-medical solid waste. The successful implementation of the patient care source separation program came at a time when the Medical Center was involved with a pilot program developed by BFI for the composting of organic waste. The Medical Center was the only hospital selected to participate in this pilot program.
sanctioned as a "demonstration project" by the New York State Department of Environmental Conservation. As a participant the Medical Center expected to recycle approximately 120,000 pounds per year of compostable food service waste. During the pilot program the Medical Center added other organic waste source separated from the patient care areas. As a result the Center was able to increase participation in the compost program from 120,000 pounds per year to over one (1) million pounds of high quality, low contamination organic waste on an annualized basis. The Medical Center's involvement in this demonstration project and its overwhelming success has written a new chapter on the value of composting as a cost effective waste management alternative for a large portion of a hospital waste stream. It is the Medical Center's strong opinion that composting must be promoted and developed more as a valuable waste management alternative for the hospital waste stream.

The Preliminary Results

To date the Albany Medical Center has essentially completed its major grant tasks and is in the process of preparing its Report for the EPA. The work performed by the Medical Center during the grant period has already provided significant environmental and financial benefits including the following:

- The results of the Medical Center's waste reduction program in its patient care and clinical areas indicated that even the most conservative hospitals can effectively and safely source separate solid waste from medical waste. The Medical Center's experience also proved that effective source separation of the patient care waste stream will reduce the volume of medical waste, medical waste disposal costs and increase the amount of patient generated waste that can be recycled.

- The Medical Center's medical waste disposal and packaging cost have been reduced by $450,000 per year as the result of the effective separation of regulated medical waste and solid waste within the patient care and clinical areas.

- The total waste recycled at the Medical Center increased an additional 1,250,000 pounds per year during the grant period, reducing the Medical Center's solid waste disposal costs by an additional $25,000.

- The total amount of waste recycled during the grant period is approximately 2.4 million pounds per year or approximately 43 percent of the Medical Center's total waste stream. (excluding hazardous waste and low level radioactive waste)
The positive results of the patient care source separation substantially increased the overall value of the Organic Waste Composting Demonstration Project that the Medical Center was involved in with its "Cure Waste" Partner BFI. The patient care source separation program developed and implemented as part of the grant increased the amount of organic waste source separated and composted from 10,000 pounds per month to 86,000 pounds per month.

The product management aspects of the "Cure Waste" program has provided the Medical Center with an opportunity to work directly with the members of the Packaging Taskforce established by the Baxter Healthcare Corporation. In this capacity the Medical Center has met directly with the Taskforce to discuss its concerns and needs as a "product user". Representatives and product designers from various Baxter Manufacturing Divisions have visited the Medical Center to seek input regarding product design, product use and packaging. This direct relationship and partnership has provided Baxter with valued customer input regarding the waste characteristics of their products and packaging. To date Baxter has already modified certain products and/or packaging to make them more waste efficient. Some of these redesigned products and packaging are now being tested at the Medical Center.

The effective waste separation program in the patient care areas proved to be an excellent compliment to the Medical Center's partnership with the Baxter Healthcare Corporation resulting in the selection of the Medical Center as one of five (5) hospitals in the United States selected by Baxter as pilot programs of source separate and recycle IV products. The pilot program with Baxter demonstrated the overall environmental and financial value associated with recycling of such products as well as providing a clear example to support the recent change in the New York State Medical Waste Law. The revised legislation, which took effect on November 23, 1993, reduces the amount of patient care and clinical waste which is defined as regulated medical waste. The combined impact of the revised definitions, the Baxter IV recycling program and the Medical Center's source separation activities has provided the Medical Center with an opportunity to recycle 100,000 pounds of IV products including high grade PVC plastic previously classified as regulated medical waste. This program has reduced the Medical Center's waste disposal costs by another $21,000. This Albany Medical Center/Baxter partnership and pilot program and the lessons learned will offer direct and immediate value to other healthcare facilities in New York State.

The nation's leading manufacturer's and suppliers of medical products and a select group of hospitals, including the Albany Medical Center, have formed the Health Resources Conservation Coalition to provide leadership, focus and direction on environmental and waste management issues for healthcare organizations,
manufacturers, suppliers and government. This coalition is now developing a blue print for communication, cooperation, education and action. The Coalition, which provides a significant opportunity for a successful supplier-user waste reduction partnership, will soon be available to an expanded membership audience.

Conclusion

The limitations on resources being imposed on today's hospitals require that facilities seek out "value added" opportunities to meet the waste management challenges of the future. The waste management activities at the Albany Medical Center, and in particular the emphasis on the waste stream generated by the patient offers new information, data and perspectives on the direction hospitals must take to meet the waste management challenges of today and the future. The results to date at the Medical Center suggests that hospitals can reach recycling goals of 25 to 30 percent with highly effective conventional recycling programs. However, goals to substantially reduce costs and/or recycle over 30 percent of its waste will require that hospitals take their waste management programs to the patient bedside. The program results at the Medical Center also suggest that such programs should include effective source separation, product and material management and a hard look at non-conventional waste management opportunities such as composting for a portion of the waste generated by patients.
Dear Healthcare Resource Conservation Coalition Advisory Board Members:

The organizational material we are sending you has taken time and effort to put together. As you can see by the action plans, a great deal of effort must continue for us to move forward. The press releases and recent articles have generated a large amount of interest from non-member persons and organizations, from both the supply and user sides of the medical community.

The packet we are sending to you includes:

- our business plan and action plan;
- a formal list of members;
- a membership application form that can be copied and distributed to other interested persons or groups;
- a sample of our stationery for your use in HRCC business;
- a calendar of events involving HRCC people;
- the AORN regulated medical waste definition;
- a copy of the notes from our last telephone conference.

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Randy Haviland
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Karen Kallas
Cavol, Inc.

Tom Mantice
Vassar Brothers Hospital

Sammy R. Nero
Providence Medical Center

Claude D. Rounds
Albany Medical Center

Joe Spitz
DHR Medical Packaging

Randy Thomas
Vinyl Plastics, Inc.

Emeritus Chairpersons:

E. Joesen Sulwell
The Sulwell Group

Holli Shaner
CGH Environmental Strategies, Inc.
We welcome your comments after you've read this material. Please understand that as we continue to grow and develop, more and more of our advisory membership will be called upon to help with the tasks ahead of us. If any of them have voiced an interest in any particular area, please feel free to encourage them to volunteer with that work group.

A few notes about the material you have just received:

1. New prospective members will be sent a copy of our business plan, a list of our membership, and a membership application form. A cover letter will tie the three together. A copy of the cover letter has been included.

2. We are asking all of our current and new members to pay a membership fee as shown. We realize that this is different from the policy that had been discussed in Boston. However, this funding is "seed money" to get us off the ground. Thus far, all of the materials, postage, stationery, and faxing, etc., have been donated. We are rapidly growing beyond where that's workable. Joe Stilwell has informed me that he has closed the books on Boston, and that we actually came out about $50 ahead. That's a relief from the potential deficit he had originally anticipated. So our treasury starts with about $50 in it.

3. The action plans have a few gaps in the "responsible" column, and certainly many action groups could use help. Please, as I said above, feel free to direct volunteers toward any area where you feel they could or would like to help.

4. The AORN definition is straightforward, but should you have any questions about it, please address them to: Jeannie Botsford, at (619) 457-6174.

You will, as the coalition develops, receive more materials fleshing out our action plans. We look forward to hearing from all of you. After all, your ideas got us started, and your ideas will help us move forward with our task of waste management through product management.

Respectfully, your co-chairs,

Lori Gettelfinger
Terry Hornseth

TDH/jmi
Healthcare Resource Conservation Coalition (HRCC)
Business Plan

April 8, 1994

Mission Statement

To form a network which promotes communication, education, and planning among all members of the health care community and will provide leadership, focus and direction on waste minimization issues for health care organizations, manufacturers, suppliers and government.

It is the opinion of this coalition that one of the most important elements of waste minimization is actually product management. Working with suppliers of products may pre-empt much of the need for the current effort being expended by institutions and service suppliers (i.e. hauler/disposer/recyclers) by providing opportunities to reduce the solid waste stream. Waste management is a "cradle to grave" fact of life for this industry.

Service Offered

The HRCC will offer a cross-directional communications network for all members of the health care community in relation to waste minimization, and waste and product management issues. The HRCC will also offer a joint national voice to governmental and regulatory bodies, from a supplier/user coalition within the health care community, relating our concerns for waste and product management and the future regulation of those areas.

Market

The market for this networking medium is broad, cutting across the supplier/user spectrum of the health care field. Four major groups will be represented by this coalition. Suppliers of health care products, suppliers of the materials used in health care products, suppliers of services to health care institutions (i.e. waste haulers/recyclers), and the health care institutions themselves.

- This coalition will provide both material and product suppliers a readily available national opinion on the future demands relating to product management. As a coalition, they will have the opportunity to communicate across a wide range of institutions on issues of national interest.

- The health care institutions will be interested in this forum as a source of information as it may relate to both their daily operations and also their future planning.
• Service suppliers (i.e. waste haulers/recyclers) will also be interested in this forum as a source of information relating to national trends and opinions directly from major institutions currently providing health care.

All four groups of this coalition will benefit from the combined strength of a unified voice on waste minimization and product management issues as they relate to governmental and regulatory bodies.

**Marketing Strategy**

It is the intention of this coalition to facilitate active communication between as many individual supplier, service, and user organizations and institutions within the health care field as is possible. Four active and ongoing programs will promote communications:

1. Electronic networking, using a bulletin board and question and answer format, by way of computer, thus facilitating immediate results

2. Written networking, by way of articles in monthly and quarterly industry publications, allowing the sharing of information through the success stories of those who have implemented successful programs

3. Personal networking, via an annual national forum to facilitate the sharing of ideas, successes, and develop a shared agenda regarding waste minimization

4. Establishing agreed upon standards/guidelines for evaluating the waste minimization impact of products purchased by health care providers

**Personnel**

The HRCC will be an organization run by volunteers drawn equally from both the supply and the user communities of the health care field. As the organization is set up now, it is lead by two co-chairs: one having medical supply leadership experience and the other having medical waste program leadership experience. Supporting the two co-chairpersons, are an advisory board comprised of ten people, five from each of the two communities. Supporting and working with the advisory board will be the advisory members and the general members. The advisory member group being made up of the 40 people who originally organized the HRCC. The balance of the membership, being those who join after the formation, will be the general members.
<table>
<thead>
<tr>
<th>Action Plans</th>
<th>Timing</th>
<th>Resp.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Administrative:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Incorporate as a non-profit organization</td>
<td>April</td>
<td>Terry, Joe</td>
</tr>
<tr>
<td>• Develop a dues structure and a membership drive for the HRCC</td>
<td>April</td>
<td>Lori, Jeannie, Ed, Randy/Claude</td>
</tr>
<tr>
<td>• Solicit the industry (suppliers, waste management companies, and hospitals)</td>
<td>April - Ongoing</td>
<td></td>
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<tr>
<td>• Develop operating procedures for the HRCC</td>
<td>June</td>
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<tr>
<td>- Develop bi-laws, election criteria for board</td>
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<tr>
<td>• Develop a membership application form, including a request for information about applicants activities in health care waste management</td>
<td>April</td>
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<tr>
<td>• Establish a steering committee to plan for a 1995 national gathering of the HRCC</td>
<td>June</td>
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<tr>
<td><strong>Characterization and Quantification</strong></td>
<td></td>
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<tr>
<td>• Develop a statement defining and characterizing health care and medical waste, as supported by the HRCC to use in building common ground within the industry</td>
<td>May</td>
<td>Hollie Shaner, Jeannie Botsford, Will Rosenblatt</td>
</tr>
<tr>
<td>- Utilize the &quot;Hospitals as a City&quot; concept to build understanding</td>
<td></td>
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<tr>
<td>• Send the AORN white paper defining infectious waste to the HRCC (AORN lobbyists pushing definition through as legislation)</td>
<td>April</td>
<td>Jeannie Botsford</td>
</tr>
<tr>
<td>• Get hospital and corporate permission from workshop participant companies to publicly support AORN definition of infectious waste. (Letter on file with the HRCC from each of the companies and then develop one letter from the HRCC)</td>
<td>May</td>
<td>All</td>
</tr>
<tr>
<td>- Develop communication campaign to pass letters on to:</td>
<td>II H 94</td>
<td>Communication Team</td>
</tr>
<tr>
<td>- Al Gore and Hillary Rodham Clinton</td>
<td></td>
<td></td>
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<tr>
<td>- State senators and congressmen</td>
<td></td>
<td></td>
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<tr>
<td>- Carol Browner - EPA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Media</td>
<td></td>
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<tr>
<td>Action Plans</td>
<td>Timing</td>
<td>Resp.</td>
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<tr>
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<tr>
<td>Regional Planning Models:</td>
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<tr>
<td>• Determine process for helping to facilitate, via networking, the connection of interested suppliers and hospitals in establishing regional waste management co-ops and publicize success stories in this arena</td>
<td>July</td>
<td>?</td>
</tr>
<tr>
<td>• Publicize the success of the Northwest Recycling co-op and determine what elements could be transferred to other upstart co-ops</td>
<td>Ongoing</td>
<td>Sam Nero</td>
</tr>
<tr>
<td>Common Ground</td>
<td></td>
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<tr>
<td>• Develop a summary of the resource conservation initiatives and programs from the workshop participants and distribute to the HRCC</td>
<td>April</td>
<td>Randy Haviland/</td>
</tr>
<tr>
<td>• Determine how to proceed on developing an outside resources contact list by surveying HRCC members and send list to the HRCC. Hollie Shaner is developing a book to do this. Options: - Support Hollie's development - Develop via HRCC</td>
<td>May</td>
<td>Hollie Shaner subteam</td>
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<tr>
<td>Systems and Objective Tools</td>
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<tr>
<td>• Develop an objective decision-making process based on the waste management cost of materials to be used by health care institutions (and communicated to suppliers)</td>
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<tr>
<td>- Develop a general model for decision making by value analysis teams (Part of an EPA report Claude is already working on)</td>
<td>March</td>
<td>Claude Rounds</td>
</tr>
<tr>
<td>- Develop a proposal for the Material Waste Data Sheet</td>
<td>April</td>
<td>Joe Spitz, Kevin Mulligan, Claude Rounds/ Randy Knack</td>
</tr>
<tr>
<td>- Develop a proposal for a product audit (An element of the total model to be used by value analysis team)</td>
<td>April</td>
<td>Ed Barr/ Claude</td>
</tr>
<tr>
<td>Action Plans</td>
<td>Timing</td>
<td>Resp</td>
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<td>----------------------------------------------------------------------------</td>
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<tr>
<td>• Develop a plan for ongoing communication within the HRCC through a newsletter or regular updates</td>
<td>April</td>
<td>Randy Thomas/ Terry/Joe Stillwell/ Lori</td>
</tr>
<tr>
<td>• Evaluate proposal by &quot;Medical Waste Analyst- Environmental Publication for the Healthcare Industry&quot; to act as that voice (Determined not to partner with this pub. now)</td>
<td>March</td>
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<tr>
<td>• Develop a plan and procedure for a quarterly newsletter/update on activities to all of the HRCC</td>
<td>April</td>
<td>Comm. Team</td>
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<tr>
<td>• Incorporate technology waste highlights in the newsletter</td>
<td>Ongoing</td>
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<tr>
<td>• Participate in and communicate about regional gatherings of suppliers/health care providers to brainstorm opportunities for working together to reduce the impact of medical waste on the environment</td>
<td>II H '94</td>
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<tr>
<td>• Develop a communication plan to keep the industry updated on the activities and position of the HRCC</td>
<td>April</td>
<td>Randy Thomas/ team</td>
</tr>
<tr>
<td>• Pharmaceutical and Medical Packaging News proposal to Joe Stillwell to act as a regular columnist (4 times/yr) as a voice to the industry for the HRCC</td>
<td>April</td>
<td>Joe Stillwell</td>
</tr>
<tr>
<td>• Develop an editorial strategy for this publication</td>
<td>April</td>
<td>Lori, Joe Randy Thomas</td>
</tr>
<tr>
<td>• Develop an editorial review process for HRCC authorized articles</td>
<td>April</td>
<td>Randy team</td>
</tr>
<tr>
<td>• Compile a portfolio of trade press release coverage or articles relating to the HRCC</td>
<td>Ongoing</td>
<td>Randy Thomas</td>
</tr>
<tr>
<td>• Solicit additional &quot;success stories&quot; from the HRCC and the new members and add to our Reference Source</td>
<td>May</td>
<td></td>
</tr>
<tr>
<td>• Compile a portfolio of articles and papers published regarding Medical Waste to be used as a reference source for the HRCC</td>
<td>Ongoing</td>
<td>Ed Barr</td>
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### Action Plans

<table>
<thead>
<tr>
<th>Action</th>
<th>Timing</th>
<th>Resp.</th>
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<tbody>
<tr>
<td>Distribute draft of model to advisory board</td>
<td>April</td>
<td>Claude</td>
</tr>
<tr>
<td>Review model with Baxter Packaging Task Force</td>
<td>May</td>
<td>Claude</td>
</tr>
<tr>
<td>Review model with HRCC subcommittee and invited suppliers at MDM East, New York</td>
<td>May 25</td>
<td>Claude</td>
</tr>
<tr>
<td>Organize subcommittee meeting for update</td>
<td>July</td>
<td>Claude</td>
</tr>
<tr>
<td>Present the model at Feb '95 Conference</td>
<td>Feb 95</td>
<td>Ed/Hollie/</td>
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<tr>
<td></td>
<td></td>
<td>Claude</td>
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<tr>
<td>Develop a pilot program implementing the use of the model</td>
<td>II H 94</td>
<td>Ed/Janet/</td>
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<tr>
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<td>Claude</td>
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<tr>
<td>Communicate about the proposed model and use of the process via the newsletter and a white paper documenting the pilot programs</td>
<td>II H 94</td>
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</table>

### Education/Communication Plans

- Issue a press release about the formation of the HRCC to industry publications and groups  
  February  Catherine
- Develop Communication campaign to gain build membership and recognition in the industry  
  April  Comm. team
- Determine the feasibility and cost of establishing a network/bulletin board (through Compu-serve, etc) for sharing information in the HRCC  
  March  Todd Apple
- Determine what information to include on the bulletin board and who will manage this ongoing  
  - Qtrly newsletter  
  - press release  
  - position statement/mission statement  
  - Medical waste dictionary  
  - Q&A bulletin board  
  - directory of references  
  - Material waste data sheet  
  - Emerging technologies in waste management  
  - Match interested co-op participants  
  April/May  Todd/Randy H/ Hollie
- Make a go/no go and timing decision on the bulletin board  
  May  Advisory Board
<table>
<thead>
<tr>
<th>Action Plans</th>
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<th>Resp</th>
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<tbody>
<tr>
<td>- Develop a communication campaign to gain support for the concept of Material Waste Data Sheets within hospitals and supply community</td>
<td>June</td>
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<tr>
<td>- Gain commitment from the AHA, AORN, and HIMA to join with the HRCC in establishing a Task Force to carry out cooperative Hospital-Supplier efforts towards reduction in the impact of Healthcare Waste in the U.S.</td>
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<tr>
<td>Major areas of activity</td>
<td></td>
<td></td>
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<tr>
<td>Contact AHA</td>
<td>April</td>
<td>Claude Houn..</td>
</tr>
<tr>
<td>Contact AORN</td>
<td>April</td>
<td>Pat Mc Veigh</td>
</tr>
<tr>
<td>Contact HIMA</td>
<td>March</td>
<td>Randy Havilan</td>
</tr>
<tr>
<td>- Develop a presentation to be presented at the 1995 Hospitals and the Environment Conference and appropriate 1995 AORN and HIMA conferences on - the Current Status of the problem - the progress to date in reducing the problem - suggested guidelines for further progress</td>
<td>II H'94</td>
<td>working group</td>
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<td>TBD</td>
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</table>
Healthcare Resource Conservation Coalition (HRCC) Members

Co-Chairs

Terry Hornseth, Director Waste Management
Mayo Medical Center
Rochester, MN

Lori Gettellinger, Market Segment Mgr
DuPont Tyvek®
Wilmington, DE

Advisory Board

Ed Barr, Support Services Manager
Thomas Jefferson Memorial Hospital
Philadelphia, PA

Randy Haviland, Manager, Community Env. Dev.
Johnson & Johnson
New Brunswick, NJ

Jeannie Botsford, RN, MS, CNOR
Administrative Director, Surgical Services
Scripps Memorial Hospital
La Jolla, CA

Tom Mattice, Dir. Environmental Services
Vassar Brothers Hospital
Poughkeepsie, NY

Sammy Nero, Environmental Services
Providence Medical Center
Portland, OR

Joe Spitz, V.P., Marketing and Technology
DRG Medical Packaging
Madison, WI

Claude Rounds, V.P. Plant Management
Albany Medical Center
Albany, NY

Nick Fotis, Manager, Packaging Eng.
I.V. Systems Division

Baxter Healthcare Corporation
Round Lake, IL

Karen Kullas, Supervisor, Product Dev. Eng, R&D
Davol, Inc., Subsidiary of C.R. Bard, Inc.
Cranston, RI

Randy Thomas, Marketing Manager
Vinyl Plastics, Inc.
Sheboygan Falls, WI

Advisory Members

Healthcare Industry

George D. Martin, Manager, Waste Management
University of Michigan Hospitals
Ann Arbor, MI

Beth Law, Recycling Manager
National Naval Medical Center
Bethesda, MD

Janet Brown, Medical Waste Manager
Beth Israel Medical Center
New York, NY

Patricia McVeigh, RN, CNOR
Dominican Hospital
Aptos, CA

Michael Connelly, Ass. Dir. Support Services
Mt. Sinai Medical Center
New York, NY

Brad Mohler, Product Manager,
VHA Plus Products
Voluntary Hospitals of America, Inc.
Irving, TX
Advisory Members (cont’t)

Healthcare Industry

Jim Gersbach, Public Affairs Representative
Kaiser Permanente
Portland, OR

Dan Stickle, Dir. Environmental Services
Butterworth Hospital
Grand Rapids, MI

Randolph C. Knack, Jr., President
Group Purchasing Services, Inc.
Albany, NY

Peter Rossi, RN, Dir. of Surgical Services
Vassar Brothers Hospital
Poughkeepsie, NY

Healthcare Suppliers

Todd Apple, Marketing Specialist Medical
DuPont Sontara®
Old Hickory, TN

John Connors, NE Region Manager, R&D
Devon Industries, Inc.
Boston, MA

Glenn Davis, Marketing Dev. Specialist
Chevron Chemical Company
Houston, TX

Luc Guay, Manager, Product Development
John Paquette, Product Dev. Mgr., Specialty Papers
E.B. Eddy Forest Products, Ltd.
Ottawa, Ontario, Canada

David Hardin, Director, Engineering Services
Smith & Nephew Richards, Inc.
Memphis, TN

Hal Miller, Corporate Manager, Packaging Technology
Donna Denniston, Business Dev. Director
Johnson & Johnson
New Brunswick, NJ

Jay Williams, Dir. of Business Development
Devon Industries
Chatsworth, CA

Dr. Miles Tieszen, Chief Resident, Surgery
Saginaw Cooperative Hospitals, Inc.
Saginaw, MI

Dr. William H. Rosenblatt, Assistant Professor
Yale University School of Medicine
New Haven, CT

Hollie G. Shaner, R.N., Waste Specialist
Medical Center Hospital of Vermont
President, CGH Environmental Partners, Inc.

Darlene Kober, Market Manager
Morton Adhesives North America
Chicago, IL

Phil Tessier, Senior Plastics Engineer, R&D
Davol, Inc., Subsidiary of C.R. Bard, Inc.
Cranston, RI

Kevin Mulligan, Manager, Packaging Eng.
Kendall Healthcare Products Co.
Mansfield, MA

E. Joseph Stillwell
The Stillwell Group
Boxford, MA

Patrick F. Van Keuren
Chairman, Environmental Task Force
Baxter Healthcare Corporation
Bentonville, CT

R. Chase Willett, Marketing Segment Mgr.
Eastman Chemical Company
Kingsport, TN

David Rudd, Director of R&D
DRG Medical Packaging
Madison, WI
MEMBERSHIP APPLICATION

Date __________________________

Name ____________________________________________

Title ____________________________________________

Company/ Hospital Name

Work Address ______________________________________

Where would you like your mail sent?

☐ Office  ☐ Home

Do you wish to have your home address published

☐ Yes  ☐ No

Membership Type

☐ Healthcare Individual $35.00
☐ Healthcare Institution $100.00
☐ Corporate $150.00
☐ Additional Members (For Healthcare Institution or Corporate membership, one representative per location. For additional members, please include $25.00/member) - Please list additional names and addresses on the back

My check in the amount of $___________ (for 1994 membership) is enclosed.

Make Check Payable to: Healthcare Resource Conservation Coalition (HRCC)
P.O. Box 6121
Rochester, MN 55903-6121

-- Over --
**Questions, Contact:**

HRCC Co-Chairs  
Terry Hornseth, Mayo Medical Center  
Phone: 507/284-1912  
FAX: 507/284-5419

Lori Gettellfinger, DuPont  
Phone: 302/999-4953  
FAX: 302/999-2988

<table>
<thead>
<tr>
<th>My Company Is:</th>
<th>Other Organizations/Associations I Belong To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Association</td>
<td>☐ Medical Device/Supply Manufacturer</td>
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<tr>
<td>☐ Consultant</td>
<td>☐ Package Design Firm</td>
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<tr>
<td>☐ Converter</td>
<td>☐ Raw Materials Manufacturer</td>
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<tr>
<td>☐ Distributor</td>
<td>☐ Waste Management</td>
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<tr>
<td>☐ Hospital Purchasing Group</td>
<td>☐ Other</td>
</tr>
<tr>
<td>☐ Hospital</td>
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| ☐ AAMI                          | ☐ HIMA                                        |
| ☐ ASHES                         | ☐ FPA                                         |
| ☐ ASHE                          | ☐ TAPPI                                       |
| ☐ ASTM                          | ☐ IOPP                                        |
| ☐ AORN                          | ☐ APC                                         |

What waste reduction program, if any, does your organization have in place?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

Primary Contact for the Program: __________________________________________

Comments: __________________________________________________________________

__________________________________________________________________________

Additional Members & Addresses

__________________________________________________________________________

__________________________________________________________________________
HEALTHCARE INDUSTRY, SUPPLY COMMUNITY, UNITE TO TACKLE MEDICAL WASTE

Historic Coalition Finds Common Ground

WOBURN, MA, February 7, 1994 ....Two million tons of medical waste are generated every year, but the newly formed Healthcare Resource Conservation Coalition (HRCC) has plans to change that.

In the first-ever effort of its kind, a unique assembly of two traditionally separate camps -- the healthcare community and its suppliers -- came together here recently to form a broad coalition committed to reducing and controlling medical waste.

Formation of the HRCC was the culmination of an intensive three-day medical waste workshop. The 40 participants, divided evenly between healthcare providers and suppliers, represented a wide spectrum of the nation's environmental leaders -- doctors and nurses, hospital engineers, purchasing agents, hospital waste managers, facilities coordinators, packaging designers and engineers, resin manufacturers, and many others.

The HRCC's mission is as follows: To provide leadership, focus and direction on environmental issues for healthcare organizations, manufacturers, suppliers and government.
"The Boston workshop helped us see the need for ongoing communication between the healthcare community and its suppliers concerning waste reduction opportunities -- something which has happened only selectively until now," said Lori Gettelfinger, Tyvek® Market Segment Manager at DuPont and one of the two co-chairpersons elected to the newly formed HRCC.

"Through the formation of the HRCC, we hope to heighten awareness and cross-communication about medical waste, share industry success stories, act as a central resource of information concerning industry initiatives, and ultimately influence legislation," she added.

"We have created a unique, ongoing education and action vehicle to transfer and share information regarding product design, development, use and disposal," according to Terry Hornseth, Director of Waste Management, Mayo Medical Center, and HRCC co-chair. "By developing creative solutions to reducing medical waste, we can help control rising healthcare costs while making a positive impact on the environment."

The medical waste workshop, which took place January 23-25, 1994 at the Radisson Hotel Boston North, was the vision of E. Joseph Stilwell, President of The Stilwell Group and a noted authority on environmentally sound packaging. Stilwell co-authored Packaging for the Environment: A Partnership for Progress.

"Two years ago, in a speech to the medical device industry, I put forth a challenge to the supply community to help build a consensus on solving the problem of medical waste and soaring healthcare costs," Stilwell recalled. "I was overwhelmed when 18 companies stepped forward.

"Immediately thereafter, I found equally enthusiastic response from the hospital community. Both sides were hungry for a forum in which to share ideas, and the medical waste workshop in Boston was the result of unprecedented cooperation and generous donations of time and funding from its participants."

In the spring of 1992, Stilwell formed a planning team, which he co-chaired with Hollie Shaner R.N., Waste Specialist at the Medical Center Hospital of Vermont and President and CEO of
CGH Environmental Strategies, Inc. Shaner also co-authored an AHA publication entitled An Ounce of Prevention: Waste Reduction Strategies for Healthcare Facilities. Stilwell, Shaner and 12 other environmental leaders from both the healthcare and supply communities organized the medical waste workshop.

"For 20 years, I've gone to work every day to save lives. In the process, I've created tons of unnecessary medical waste," observed Shaner. "We have now seen what is possible when people who care about the environment find common ground."

The full list of workshop participants is attached.

The medical waste workshop was guided in its efforts by Innovation Focus (IF), a professional facilitating organization based in Lancaster, PA, which specializes in creative problem solving for new product development. IF President Chris Miller, Ph.D., and a five-person staff established the ground rules and structure for the workshop, based on the Focused Innovation (patent pending) technique developed by Dr. Miller.

Over the next month, the Healthcare Resource Conservation Coalition will be developing a blueprint for action based on the intensive three-day efforts of the Boston workshop. A copy of the statement may be obtained by writing to the HRCC at P.O. Box 6121, Rochester, MN 55903-6121.

For further information (press only), contact Catherine Marenghi, Marenghi & Howlett, (617) 239-0057.

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This release has been printed on 100% recycled paper.
BYLAWS
OF
HEALTHCARE RESOURCE CONSERVATION COALITION CORPORATION

ARTICLE I.
OFFICES, CORPORATE SEAL

Section 1.01. Registered Office. The registered office of this corporation located in Minnesota shall be that as set forth in the Articles of Incorporation, or in the most recent amendment of the Articles of Incorporation, or in a writing reflecting the adoption of a resolution of the directors filed with the Secretary of State of Minnesota changing the registered office.

Section 1.02. Other Offices. This corporation may have such other offices, within or without the State of Minnesota, as the Board of Directors may from time to time determine.

Section 1.03. Corporate Seal. This corporation shall have no corporate seal.

ARTICLE II.
MEMBERS AND MEETINGS OF MEMBERS

Except as provided herein, provisions relating to the voting members of this corporation shall be as provided in the Minnesota Nonprofit Corporation Act.

Section 2.01. Qualification of Voting Members. The voting members of this corporation shall be those persons who are current in the payment of dues and who have been elected as members by the Board of Directors of this corporation.

Section 2.02. Term of Membership. Each membership shall be for one (1) year.

Section 2.03. Termination of Membership. Membership shall terminate (1) automatically at any time that the member is not current with respect to dues payments or (2) by vote of the Board of Directors provided that the member is given not less than fifteen days prior written notice of the proposed termination and the reasons for it, and the member is given an opportunity to be heard in writing, not less than five days before the effective date of the termination by a person authorized to decide that the proposed termination not take place.

Section 2.04. Dues. Dues are to be paid annually. The dues structure and amounts of dues may be changed by a majority vote of the Board of Directors once per year at the beginning of the fiscal year. The dues structure and amounts are as follows:

Healthcare Individual $35.00
Healthcare Institution $100.00
Corporation $150.00
Additional Members - The foregoing dues for a healthcare institution or corporation covers one representative per location, per institution or corporation. For additional members within the member institution or corporation, add $25.00 per member.
Definitions of membership categories:
Healthcare Individual - An individual who works within a clinic, hospital, or medical center, who chooses to join independently from their employer.
Healthcare Institution - A clinic, hospital, or medical center.
Corporation - A corporate entity.

ARTICLE III.
BOARD OF DIRECTORS

Section 3.01. General Powers. The property, affairs, and business of this corporation shall be managed by the Board of Directors.

Section 3.02. Number, Qualification, and Term of Office. The number of directors shall be not less than three (3), but from time to time the number may be increased or may be diminished to not less than three (3), by the affirmative vote of the members, if any, or, if there are no members, a majority of the whole number of directors. Each director shall hold office until the next annual meeting of the directors next following his or her election and until his or her successor shall have been elected and shall qualify, or until his or her death, resignation, or removal as hereinafter provided.

Section 3.03. Organization. At each meeting of the Board of Directors, the Co-Chairs of this corporation, or in either of their absence, the Co-Chair of this corporation present shall preside. The Secretary of this corporation or, in his or her absence, any person whom the co-chairs shall appoint, shall act as secretary of the meeting.

Section 3.04. Resignation. Any director of this corporation may resign at any time by giving written notice to either of the Co-Chairs or to the Secretary of this corporation. The resignation of any director shall take effect at the time specified therein; and, unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective.

Section 3.05. Vacancies. Any vacancy in the Board of Directors caused by death, resignation, disqualification, removal, an increase in the number of directors, expiration of term, or any other cause, may be filled by vote of the members, or if there are no members of the corporation, by the remaining directors. (though less than a quorum), and each director so chosen shall hold office until the next annual election and until his or her successor shall be duly elected and qualified. Notwithstanding the foregoing, if there are members with voting rights, the Board of Directors may fill a vacancy until the next annual meeting of members.
Section 3.06. Place of Meetings. The Board of Directors may hold its meetings at such place or places, within or without the State of Minnesota, as it may from time to time determine.

Section 3.07. Annual Meeting. The annual meeting of the Board of Directors shall be held each year for the purpose of electing the officers of this corporation and for the transaction of such other business as shall come before the meeting. Notice of such meeting shall be given as hereinafter provided for special meetings of the Board of Directors, or in a consent and waiver of notice thereof signed by all of the directors.

Section 3.08. Special Meetings; Notice. Special meetings of the Board of Directors shall be held whenever called by either of the Co-Chairs or by any one of the directors. Notice of each such special meeting shall be faxed or mailed to each director, at his or her residence or usual place of business, at least two (2) days before the day on which the meeting is to be held, or be delivered personally or by telephone not later than one (1) day before the day on which the meeting is to be held. Each such notice shall state the time and place of the meeting, but need not state the purposes thereof except as otherwise herein expressly provided. Notice of any meeting of the Board need not be given to any director who shall be present at such meeting; and any meeting of the Board shall be a legal meeting without any notice thereof having been given, if all of the directors of this corporation then in office shall be present thereat or waive such notice in writing before, at, or after such meeting.

Section 3.09. Quorum and Manner of Acting. Except as otherwise provided by statute or by these Bylaws, one-half ($1/2$) of the total number of directors (but, if there are three (3) directors, not less than two (2)) shall be required to constitute a quorum for the transaction of business at any meeting, and the act of a majority of the directors present at any meeting at which a quorum is present shall be the act of the Board of Directors. In the absence of a quorum, a majority of the directors present may adjourn any meeting from time to time until a quorum be had. Notice of any adjourned meeting need not be given.

Section 3.10. Removal of Directors. Any director may be removed, either with or without cause, at any time, by a vote of a majority of the total number of directors at a special meeting of the directors called for the purpose or by the member, and the vacancy in the Board of Directors caused by any such removal shall be filled in the manner specified in Section 3.05 hereof.

Section 3.11. Proxies. Proxies shall not be allowed or used.

ARTICLE IV.
OFFICERS

Section 4.01. Number. The officers of this corporation shall be two (2) Co-Chairs, a Secretary, a Treasurer, and such other officers as may be elected by the Board of Directors. Any two (2) offices, except those of Co-Chair may be held by the same person.
Section 4.02. Election, Term of Office, and Qualifications. All officers shall be elected annually by the Board of Directors, and, except in the case of officers appointed in accordance with the provisions of Section 4.10, each shall hold office until the next annual election of officers and until his or her successor shall have been duly elected and qualified, or until his or her death, or until he or she shall resign, or until he or she shall have been removed in the manner hereinafter provided.

Section 4.03. Resignations. Any officer may resign at any time by giving written notice of his or her resignation to the Board of Directors, to the Co-Chairs, or to the Secretary of this corporation. Any such resignation shall take effect at the time specified therein; and, unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective.

Section 4.04. Removal. Any officer may be removed, either with or without cause, by a vote of the Board of Directors, at a meeting called for the purpose, and such purpose shall be stated in the notice or waiver of notice of such meeting unless all the directors of this corporation shall be present thereat.

Section 4.05. Vacancies. A vacancy in any office because of death, resignation, removal, or any other cause shall be filled for the unexpired portion of the term in the manner prescribed in these Bylaws for election to such office.

Section 4.06. Co-Chairs. The Co-Chairs shall exercise together the duties of chief executive officer of this corporation and shall have general active management of the business of this corporation. They shall, when present, preside at all meetings of the directors. The Co-Chairs shall see that all orders and resolutions of the Board of Directors are carried into effect. The Co-Chairs may independently, with the written acknowledgement of the other Co-Chair, execute and deliver in the name of the corporation any deed, mortgage, bond, contract, or other instrument pertaining to the business of this corporation, including without limitation, any instruments necessary or appropriate to enable this corporation to donate income or principal of the corporation to or for the account of such organizations, causes, and projects described in the Articles of Incorporation of this corporation and as this corporation was organized to support, and, in general, shall perform all duties usually incident to the office of the Co-Chair. The written acknowledgement from the absent Co-Chair shall be attached to the instrument executed by the other Co-Chair. The written acknowledgement may be in the form of a fax. They shall have such other duties as may from time to time be prescribed by the Board of Directors.

Section 4.07. Secretary. The Secretary shall be the Secretary of, and when present, shall record proceedings of meetings of the Board of Directors. He or she shall, when directed to do so, give proper notice of meetings of the directors. The Secretary shall perform such other duties as may from time to time be prescribed by the Board of Directors or by the Co-Chairs and, in general, shall perform all duties usually incident to the office of the Secretary.
Section 4.08. Treasurer. The Treasurer shall keep accurate accounts of all moneys of this corporation received or disbursed; shall deposit all moneys, drafts and checks in the name of, and to the credit of, this corporation in such banks and depositories as a majority of the Board of Directors shall from time to time designate. The Treasurer shall have power to endorse for deposit all notes, checks, and drafts received by this corporation. He or she shall disburse the funds of this corporation as ordered by the Board of Directors, making proper vouchers therefor. The Treasurer shall render to the President and the directors, whenever required, an account of all his or her transactions as Treasurer and of the financial condition of this corporation, and shall perform such other duties as may from time to time be prescribed by the Board of Directors or by the President; and, in general, shall perform all duties usually incident to the office of the Treasurer.

Section 4.09. Other Officers. This corporation may have such other officers and agents as may be deemed necessary by the Board of Directors, who shall be appointed in such manner, have such duties, and hold their offices for such terms as may be determined by resolution of the Board of Directors.

Section 4.10. Compensation. The officers, agents, and employees of this corporation may be paid such reasonable compensation for their services rendered to this corporation in such capacities and be reimbursed for such reasonable expenses necessarily incurred by them in rendering such services as the Board of Directors may from time to time determine to be directly in furtherance of the purposes of, and in the best interests of, this corporation.

Section 4.11. Bond. The Board of Directors of this corporation shall from time to time determine which, if any, officers, agents, or employees of this corporation shall be bonded and the amount of each bond.

ARTICLE V.
COMMITTEES

Section 5.01. Committees. The Board of Directors may act by and through such committees as may be specified in resolutions adopted by a majority of the whole number of directors. Each such committee shall have such membership, duties, and responsibilities as are established for it from time to time by the Board of Directors.

Section 5.02. Miscellaneous. The Co-Chairs shall from time to time appoint mutually agreed upon chairs of each committee. Each committee of this corporation may establish the time for its regular meetings and may change that time as it from time to time deems advisable. Special meetings of any committee of this corporation may be called by the chair of that committee or by the Co-Chairs. Two days' notice by mail, telephone, or fax shall be given of any special meeting of a committee. At all meetings of a committee of this corporation, each member thereof shall be entitled to cast one vote on any question coming before such meeting. The presence of one-third (1/3) of the membership of any committee of
this corporation shall constitute a quorum at any meeting thereof, but the members of a committee present at any of such committee, although less than a quorum, may adjourn the meeting from time to time. A majority vote of the members of a committee of this corporation present at any meeting thereof, if there be a quorum, shall be sufficient for the transaction of the business of such committee.

ARTICLE VI.
BOOKS OF RECORD, AUDIT AND FISCAL YEAR

Section 6.01. Books and Records. The Board of Directors of this corporation shall cause to be kept:

1. records of all proceedings of members, directors, and committees; and

2. such other records and books of account as shall be necessary and appropriate to the conduct of the corporate business.

Section 6.02. Documents Kept at Registered Office. The Board of Directors shall cause to be kept at the registered office of this corporation originals or copies of:

1. records of all proceedings of members, directors, and committees;

2. all financial statements of this corporation; and

3. Articles of Incorporation and Bylaws of this corporation and all amendments and restatements thereof.

Section 6.03. Audit. The Board of Directors may cause the records and books of account of this corporation to be audited at least once in each fiscal year and at such other times as it may deem necessary or appropriate, and may retain such person or firm for such purposes as it may deem appropriate.

Section 6.04. Fiscal Year. The fiscal year of the corporation shall be determined by the Board of Directors.

ARTICLE VII.
WAIVER OF NOTICE

Whenever any notice whatsoever is required to be given by these Bylaws or any of the corporate laws of the State of Minnesota, such notice may be waived in writing, signed by the person or persons entitled to such notice, whether before, at, or after the time stated therein or before, at, or after the meeting.
ARTICLE VIII.
AUTHORIZATION WITHOUT A MEETING

Any action that may be taken at a meeting of the Board of Directors may be taken without a meeting when authorized in writing signed by all of the directors, or by less than all the directors as provided in the Articles of Incorporation.

ARTICLE IX.
INDEMNIFICATION

The corporation shall indemnify such persons, for such expenses and liabilities, in such manner, under such circumstances, and to such extent as permitted by any applicable law.

ARTICLE X.
AMENDMENTS

The corporation's Articles of Incorporation, as from time to time amended or restated, and these Bylaws, as from time to time amended or restated, may be amended in the manner provided in the Minnesota Nonprofit Corporation Act.
ARTICLES OF INCORPORATION
OF
HEALTHCARE RESOURCE CONSERVATION COALITION CORPORATION

The undersigned, for the purpose of organizing a corporation under the provisions of the Minnesota Nonprofit Corporation Act, Minnesota Statutes, Chapter 317A, adopts the following Articles of Incorporation:

ARTICLE I
NAME

The name of this corporation is "Healthcare Resource Conservation Coalition Corporation."

ARTICLE II
PURPOSES AND POWERS

This corporation is organized and shall be operated exclusively for the promotion of the common business and professional interests of organizations involved in disposal of medical waste by (1) providing a national information exchange with respect to disposal of medical waste and medical waste management issues, (2) publishing a newsletter relating to medical waste disposal and management topics, (3) conducting meetings at which medical waste topics would be addressed and (4) such other related activities as promote the common interests of persons involved in the management and disposal of medical waste, all within the meaning of, and as contemplated and permitted by, Section 501(c)(6) of the Internal Revenue Code of 1986 (the "Code"). Within the framework and limitations of the foregoing, this organization is organized and shall be operated exclusively to engage in, advance, support, promote, and administer activities, causes, and projects of every kind and nature whatsoever in its own behalf, or as agent, trustee, or representative of others, and, to the extent consistent with the foregoing purposes, to aid, assist, and contribute to the support of corporations, associations, trusts, foundations, and institutions that are organized and operated exclusively for one or more purposes described in Section 501(c)(6) of the Code, and that are exempt from federal income taxes under Section 501(a) of the Code.

For such purposes, and not otherwise, this corporation shall have and may exercise all powers that are afforded to this corporation by the Minnesota Nonprofit Corporation Act; provided, however, that this corporation shall not carry on any activity not permitted to be carried on by a corporation that is exempt from federal income tax under Section 501(a) of the Code as an organization described in Section 501(c)(6).

All references in these Articles of Incorporation to a particular section of the Internal Revenue Code of 1986 shall mean and include, as now enacted or as hereafter amended, such section and any provision of federal law as is or may hereafter be applicable,
cognate to such section. All references in these Articles of Incorporation to the Minnesota Nonprofit Corporation Act shall mean and include, as now enacted or as hereafter amended, Chapter 317A of the Minnesota Statutes and any provision of Minnesota law as is or may hereafter be applicable cognate to such chapter.

ARTICLE III
PROHIBITED ACTIVITIES

This corporation shall not, directly or indirectly, afford or pay any pecuniary gain, dividends, or other pecuniary remuneration to its members as such, and no part of the net income or earnings of this corporation shall, directly or indirectly, inure to the benefit of any member or person having a personal and private interest in the activities of the corporation, but this corporation may pay reasonable compensation for services rendered to this corporation in furtherance of its purposes set forth in Article II hereof. Except as permitted by applicable law, this corporation shall not lend money to, or guarantee the obligation of, any director or officer of this corporation.

ARTICLE IV
REGISTERED OFFICE

The registered office for this corporation shall be at the following address:

Healthcare Resource Conservation Coalition Corporation
2004 18 1/2 Avenue N.W. (#4)
Rochester, Minnesota 55901

The registered agent at this address is Terry D. Hornseth.

ARTICLE V
INCORPORATOR

The name and addresses of the incorporators, who are adult natural persons, are:

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
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</thead>
<tbody>
<tr>
<td>Lori A. Gettelfinger</td>
<td>916 Iroquois Trail</td>
</tr>
<tr>
<td></td>
<td>Goodlettsville, TN 37072</td>
</tr>
<tr>
<td>Terry D. Hornseth</td>
<td>2004 18 1/2 Avenue N.W. (#4)</td>
</tr>
<tr>
<td></td>
<td>Rochester, MN 55901</td>
</tr>
</tbody>
</table>
ARTICLE VI
NO PERSONAL LIABILITY

The officers, directors, and members if any, of this corporation shall not be personally liable to any extent whatsoever for any debts or obligations of this corporation.

ARTICLE VII
DISSOLUTION

This corporation may be dissolved in accordance with the laws of the State of Minnesota. Upon dissolution of this corporation, and after the payment of all liabilities and obligations of this corporation and all costs and expenses incurred by this corporation in connection with such dissolution, any remaining assets shall be distributed to such one or more corporations, associations, trusts, foundations, and institutions as are then in existence, are exempt from federal income taxes under Section 501(a) of the Code, and are organized and operated exclusively for one or more purposes described in Sections 170(c)(2) and 501(c)(3), or Section 501(c)(6) of the Code, in such proportions as shall be determined by the Board of Directors of this corporation, or, only if required by laws of the State of Minnesota then in existence that a court of competent jurisdiction conduct the dissolution, by such court. Notwithstanding anything apparently or expressly to the contrary contained in this Article, if any assets are then held by this corporation in trust or upon condition or subject to any executory or special limitation, and if the condition or limitation occurs by reason of the dissolution of this corporation, such assets shall revert or be returned, transferred, or conveyed in accordance with the terms and provisions of such trust, condition, or limitation.

ARTICLE VIII
MEMBER CLASSIFICATION

The members of the corporation may from time to time be classified among classes as provided for in the Bylaws of the corporation.

ARTICLE IX
ADOPTION AND AMENDMENT OF BYLAWS

The initial Bylaws of the corporation may be adopted by the incorporators and the Board of Directors; and thereafter the power to adopt, amend, revise, and repeal the Bylaws is reserved to the members of the corporation.
ARTICLE X
WRITTEN ACTION BY DIRECTORS

An action required or permitted to be taken at a meeting of the Board of Directors of the corporation may be taken by a written action signed, or counterparts of a written action signed in the aggregate, by all of the directors unless the action need not be approved by the shareholders of the corporation, in which case the action may be taken by a written action signed, or counterparts of a written action signed in the aggregate, by the number of directors that would be required to take the same action at a meeting of the Board of Directors of the corporation at which all of the directors were present.

IN WITNESS WHEREOF, I have hereunto set my hand this ______ day of __________, 1994.

Lori A. Gettellfinger

Terry D. Hornseth

( Date )

( Date )
HEALTHCARE RESOURCE CONSERVATION COALITION MEMBERS (HRCC)

<table>
<thead>
<tr>
<th>NAME</th>
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<tr>
<td><strong>CO-CHAIRS</strong></td>
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<tr>
<td>Terry Homseth</td>
<td>Mayo Medical Center</td>
<td>507/284-1912</td>
<td>507/284-5419</td>
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<td>200 2nd Street SW</td>
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<tr>
<td>Lori Gettelfinger</td>
<td>DuPont Marketing</td>
<td>615/851-6507</td>
<td>615/851-9169</td>
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<td>916 Iroquois Trail</td>
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<td><strong>ADVISORY BOARD</strong></td>
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<tr>
<td>Ed Barr</td>
<td>Thomas Jefferson Univ. Hospital</td>
<td>215/955-6213</td>
<td>215/923-7321</td>
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<td>G-106, Main Bldg.</td>
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<tr>
<td>Jeannie Botsford</td>
<td>Scripps Memorial Hospital</td>
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<td>619/457-7151</td>
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<tr>
<td>Nick Fotis</td>
<td>Baxter Healthcare Corp.</td>
<td>708/270-4880</td>
<td>708/270-3940</td>
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<tr>
<td>Randy Haviland</td>
<td>Johnson &amp; Johnson</td>
<td>908/524-6331</td>
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<td>One Johnson &amp; Johnson Plaza</td>
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<td>New Brunswick, NJ 08933</td>
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<tr>
<td>Karen E. Kullas</td>
<td>Davol, Inc.</td>
<td>800/556-6756</td>
<td>401/946-7130</td>
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<td>Subsidiary of C. R. Bard, Inc.</td>
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| Beth Law               | National Naval Medical Center  
8901 Wisconsin Ave.  
Bldg. 14  
Bethesda, MD 20889-5600                                                                                                                                  | 301/295-0725 | 301/295-4391     |
| George D. Martin       | Univ. of Michigan Hospitals  
1500 East Med. Ctr. Drive  
Terrace B/0760  
Ann Arbor, MI 48109-0760                                                                                                                                | 313/936-5079 | 313/936-7575     |
| Patricia McVeigh R.N.  | 6107 Sheraton Place  
Aptos, CA 95003                                                                                                                                                    | 408/479-9148 |                  |
| Brad D. Mohler         | VHA Plus Products  
Voluntary Hosp. of Americas  
300 Decker Drive  
Irving, TX 75062                                                                                                                                                | 214/650-4444 | 214/650-4330     |
| Dr. William Rosenblatt | Yale Univ. School of Medicine  
333 Cedar Street  
POB 208051  
New Haven, CT 06520-8051                                                                                                                                         | 203/785-2802 | 203/785-6664     |
| Peter Rossi            | Vassar Brothers Hospital  
Reade Place  
Poughkeepsie, NY 12601                                                                                                                                         | 914/437-3039 | 914/437-3171     |
| Hollie D. Shaner       | Med. Ctr. Hosp. of Vermont  
11 Colchester Ave  
Burlington, VT 05401                                                                                                                                 | 802/656-2399 | 802/678-9507     |
| Dan Stickles           | Butterworth Hosp.  
100 Michigan NW  
Mail Code 79  
Grand Rapids, MI 49503                                                                                                                                         | 616/774-1801 | 616/456-2745     |
| Dr. Myles E. Tieszen   | Saginaw Coop Hospitals, Inc  
1000 Houghton Street  
Saginaw, MI 48602                                                                                                                                             | 517/771-6827 | 517/753-3439     |
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<td>Joan Jones</td>
<td>Incendere, Inc.</td>
<td>804/424-7710</td>
<td>804/424-7737</td>
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<td></td>
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<td>JoAnne Jones</td>
<td>Zimmer Patient Care Division</td>
<td>216/343-8801</td>
<td>216/343-9070</td>
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<td>200 West Ohio Ave., POB 10</td>
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<td>Mark G. Ligon</td>
<td>United Health Services Hosp., Inc.</td>
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<td>Leslie Logan</td>
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<td>414/232-7020</td>
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<tr>
<td>Tom Powell</td>
<td>Sage Products, Inc.</td>
<td>815/455-4700</td>
<td>815/455-5599</td>
</tr>
<tr>
<td></td>
<td>815 Tek Drive</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Crystal Lake, IL 60014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kathy Salingere</td>
<td>Envirotech Enterprises</td>
<td>602/742-3087</td>
<td>602/575-0511</td>
</tr>
<tr>
<td></td>
<td>7400 North Oracle Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suite 330</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tucson, AZ 85704</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patti Van Der Burg</td>
<td>Origin Medsystems</td>
<td>415/617-5103</td>
<td>415/617-5101</td>
</tr>
<tr>
<td></td>
<td>135 Constitution Drive</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Menlo Park, CA 94025</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
STATEWIDE POLLUTION PREVENTION WORKSHOP FOR HEALTH CARE FACILITIES

RESOURCE CONSERVATION & RECOVERY ACT (RCRA)

DON LININGER
U. S. EPA REGION VII
913/551-7724

December 1994
PRIMARY GOALS OF RCRA

- Protect Human Health And The Environment From The Potential Hazards Of Improper Waste Handling
- To Conserve Energy & Natural Resources
- To Encourage Waste Minimization
- To Ensure That Wastes Are Managed In An Environmentally Sound Manner

- 40 CFR Part 259 - Standards For The Tracking & Management Of Medical Waste
HAZARDOUS WASTE DETERMINATION

• 40 cfr 262.11 -
  A generator who generates a solid waste, as defined in 40 CFR 261.2, must determine if that waste is a hazardous wastes using the following method:
    » Excluded By 261.4
    » Listed In 40 CFR 261 Subpart D
    » Identified In 40 CFR 261 Subpart C
      – Testing
      – Process Knowledge
HAZARDOUS WASTE DETERMINATION

- 40 CFR 261 Subpart D - Listed Hazardous Wastes
  » Non-specific Sources - F Listed
  » Specific Sources - K Listed
  » Discarded Commercial Chemical Products - P & U Listed
HAZARDOUS WASTE DETERMINATION

- 40 CFR 261 Subpart C - Characteristic Hazardous Wastes
  - Ignitable - Flashpoint <140°F D001
  - Corrosive - pH ≤ 2 or pH ≥ 12.5 D002
  - Reactive - Unstable, Readily Undergoes Violent Change D003
  - Toxicity - TCLP D004 - D043
    - Metals
    - Volatiles
    - Semi-Volatiles
    - Pesticides/Herbicides
GENERATOR REQUIREMENTS

- **Conditionally Exempt Small Quantity Generator (CESQG)**
  - < 100 Kg/Mo. Hazardous Waste
  - < 1 Kg/Mo. Acutely Hazardous Waste
  - 40 CFR Part 261.5

- **Small Quantity Generator (SQG)**
  - Between 100 & 1,000 Kg/Mo. Hazardous Waste
  - <1 Kg/Mo. Acutely Hazardous Waste
  - Most Requirement - 40 CFR Part 262

- **Large Quantity Generator (LQG)**
  - > 1,000 Kg/Mo. Hazardous Waste
  - > 1 Kr/Mo. Acutely Hazardous Waste
  - All Requirements - 40 CFR Part 262
INFORMATION NUMBERS

- RCRA/IOWA 913/551-7058
- RCRA/Superfund Hotline 800/424-9346
- IDNR 515/281-5145
- IWRC 800/422-3109
STATEWIDE POLLUTION PREVENTION
WORKSHOP FOR HEALTH CARE FACILITIES

INFECTIONOUS
BIO-HAZARDOUS
WASTE

PAUL LUNDY
IDNR ENVIRONMENTAL PROTECTION DIVISION
515/281-8912

December 1994
DEFINITION

- Infectious Waste Definition Is In Iowa Administrative Code Section 567 Chapter 100

  » Paul Lundy 515/281-8912

  » Special Waste Authorization Issues:
    Lavoy Haage 515/281-4968
    Shirley Richards 515/281-8801
AIR QUALITY PERMITS

• In Polk County:
  » Gary Young 515/286-3372
  Polk Co. Dept. Of Health

• In Linn County:
  » Greg Siager 319/398-3551
  Linn Co. Dept. Of Health

• All Others:
  » INDR Air Quality Bureau
  » Tracy Rector 515/242-6494
TRANSPORTATION REGULATIONS

- Iowa Dept. Of Transportation
  » Tom Sever  515/237-3278
WASTEWATER

• Pretreatment Agreements For Wastewater Permits
  » Steve Williams  515/281-8884
    IDNR
  » John Havens  319/366-6126
    Iowa Medical Waste Reduction Center
HOSPITAL WORKSHOP OUTLINE

Kim Evangelisti
Iowa Waste Reduction Center
(319)273-2079
(800)422-3109

FLUORESCENT BULBS

• Current management options - Spent fluorescent bulbs are potentially hazardous and must undergo a hazardous waste determination.

1. TCLP test the bulbs for the eight heavy metals. Make sure the sample taken is representative of all types and brands of bulbs used. More than one test may be necessary.

1.a If the bulbs test hazardous recycle through an EPA- or state-approved company using a hazardous waste manifest. Include the bulbs in the total hazardous waste inventory for your facility. Store the spent bulbs in the original boxes (labeled "spent fluorescent bulbs) to avoid breakage. Store broken bulbs in a closed, labeled container.

1.b If the bulbs test nonhazardous, they may be disposed of in a sanitary landfill, or recycled by any reputable company.

2.) Assume that the bulbs are hazardous and manage them according to 1.a above. (It is likely that the bulbs will test hazardous.)

• Proposed Regulations

The EPA issued proposed regulations in the July 27, 1994 Federal Register, in which they offer two basic management options and ask for comments. The two management options are:

1. Exclude fluorescent bulbs from hazardous waste regulation provided that the generator:
   - disposes of them in a municipal solid waste landfill, OR
   - sends them to a state-permitted, licensed, or registered reclamation facility, AND
   - keeps a record of the bulbs shipped to management facilities.

2. Keep hazardous waste regulation in place for ultimate disposal or reclamation of fluorescent bulbs, but put them under a special collection system that would "minimize regulatory requirements applicable to ... generation, transportation, and storage." Minimizing collection requirements is meant to encourage proper bulb management.

Approximate Costs of Recycling Fluorescent Lights

<table>
<thead>
<tr>
<th>TYPE</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-foot tube</td>
<td>$0.51</td>
</tr>
<tr>
<td>Tubes over 4 feet</td>
<td>$0.70</td>
</tr>
<tr>
<td>and</td>
<td></td>
</tr>
<tr>
<td>U-tubes</td>
<td></td>
</tr>
<tr>
<td>Broken tubes</td>
<td>$2.00/pound</td>
</tr>
</tbody>
</table>

Most companies have a minimum pick-up charge. Reduce costs by contacting other area businesses that generate used bulbs to arrange a "milk run" pickup for the recycler.
LABORATORY SOLVENTS

Laboratory solvents used in tissue preparation are usually hazardous because they are ignitable (flashpoint less than 140°F - see Material Safety Data Sheet), or they are listed by the EPA as being hazardous.

1. **Do not** discharge ignitable liquids to the sewer (federal law prohibits this).

2. Collect spent solvents in a closed, labeled container and dispose/recycle through a hazardous waste management company. (Do not exceed CESQG/SQG storage limits.)

3. Small amounts of non-ignitable solvents and other liquid lab wastes may be discharged to the city sewer with prior approval from the wastewater treatment plant supervisor.

CHEMOTHERAPY DRUGS

- Spent chemotherapy drugs may be hazardous if they exhibit one or more characteristic of a hazardous waste (ignitibility, corrosivity, reactivity, toxicity).

- Unused chemotherapy drugs may be hazardous if they exhibit one or more characteristic of a hazardous waste, or if they are found on the EPA's **U or P list**. (A copy of these lists are available from the IWRC at 319/273-2079.)

INCINERATORS

Hospital incinerators are required to have the following in order to burn infectious waste:

- Air permits from the DNR; a construction permit and a Title V operating permit (or verification that Title V does not apply).

- A **Sanitary Disposal Project Permit** which includes a comprehensive plan for incinerators that burn any noninfectious waste.

- Updated **Incinerator Operator Certification** for all operators.

- **Hazardous Waste Determination on Ash** - Incinerator ash must be laboratory tested (TCLP) for the eight heavy metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver) prior to disposal. Ash with concentrations of heavy metals above the regulatory limits is hazardous waste and must be managed as such.

Fulfilling these requirements allows a hospital to burn infectious waste only. **Never put hazardous waste into a hospital incinerator.**

X-RAY WASTE

1. Scrap film contains silver, which is a hazardous waste unless it is recycled. A list of silver reclaimers is available by calling the IWRC (319/273-2079).

2. Spent x-ray developing solution also contains silver. The silver must be extracted prior to discharging the spent solution to the city sewer. Most hospitals contract with a company that provides them with a silver reclaimer. Hospitals should make sure that the wastewater from the silver reclaimer has been tested to prove that the silver is being effectively extracted.
MERCURY WASTE

1. Mercury waste comes primarily from broken equipment. Hospitals should have a mercury spill kit on hand to be prepared to clean spills properly.

2. Recovered mercury must be stored in a closed, labeled container and reused in equipment or recycled through a permitted mercury recycler.

3. Mercury-contaminated materials (as from spill clean-up) must also be stored in closed labeled containers and disposed/recycled by a hazardous waste management company.

ABOVEGROUND STORAGE TANK REQUIREMENTS

1. All used oil storage containers must be labeled "USED OIL" and maintained in good condition.

2. DNR's Spill Prevention Control and Countermeasure (SPCC) regulation applies to facilities whose petroleum above-ground storage meets the following criteria:
   
   • Total storage capacity of 1,320 gallons or more
   
   • One or more individual storage tank has a capacity of 660 gallons or more

   Facilities to whom the above criteria apply must design and submit to the DNR a Spill Prevention Control and Countermeasure (SPCC) Plan. An SPCC Plan describes the potential for environmental contamination in the event of a spill or leakage from the storage tank, and outlines the measures that would be taken to protect the environment in such a situation. The plan must be approved by a professional engineer and kept on-site at all times.
Iowa Energy Bank Program
What are the Benefits of the Program?

• Improved Facilities
  – Modernize old Systems
    » Lighting
    » Temperature Controls
    » Heating
    » Cooling
    » Insulation

• Coordination of Efforts
  – Utility Company Programs
    » Electric Utility Rebates
    » Gas Utility Rebates

• More $$$$$$$ for Your Mission
  – Education
  – Health Care
  – Public Service
Why Join the Iowa Energy Bank Program?

- Take advantage of help that is available NOW
  - Utility Rebates
  - Low Interest Financing
  - Expert Advice
  - Technical Assistance

- Comply with Iowa Code

- Start Now to Enjoy Savings Tomorrow

- Why Not !!!
  - The program is easy and takes little time
Iowa

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Local Government

/Erzergy Bank ProgramI
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Use continued savings
for other priorities

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Repay Lease

(and engineering loan)
through energy savings

Basic
Proceclures

Energy savings

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irllprovernerits

Financing

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loan frorn
I>NR pays for analysis

Local Government
selects iniprovements for
financing based on payback

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.

arranged with help from
Evensen Dodge, Alilers Law Firm
and Norwest


<table>
<thead>
<tr>
<th>INSTITUTION:</th>
<th>COUNTY HOSPITAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUILDING:</td>
<td>COUNTY HOSPITAL</td>
</tr>
</tbody>
</table>

### SUMMARY OF PROJECTS ANALYZED - PART I

<table>
<thead>
<tr>
<th>PG #</th>
<th>PROJECT TITLE</th>
<th>Electric KWH/yr</th>
<th>Savings $/YEAR</th>
<th>KW</th>
<th>Demand T&amp;D Savings $/YEAR</th>
<th>Natural Gas Savings CCF/yr</th>
<th>$/YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Install Energy Management Control System</td>
<td>3,657</td>
<td>109</td>
<td>201.5</td>
<td>A &amp; B 2737</td>
<td>39,697 9,726</td>
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<tr>
<td>5</td>
<td>Install Steam Booster Heater</td>
<td>22,450</td>
<td>669</td>
<td>93.4</td>
<td>A &amp; B 1,260</td>
<td>(1,179) (289)</td>
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<tr>
<td>5</td>
<td>Replace Absorption Chiller Generator Tubes Section</td>
<td>367</td>
<td>11</td>
<td>0.8</td>
<td>A &amp; B 11</td>
<td>16,194 3,968</td>
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<tr>
<td>5</td>
<td>Complete Conversion To</td>
<td>15,376</td>
<td>458</td>
<td>37.3</td>
<td>A &amp; B 503</td>
<td>(254) (62)</td>
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<tr>
<td>5</td>
<td>Install Energy Saving Ballasts</td>
<td>12,744</td>
<td>380</td>
<td>23.1</td>
<td>A &amp; B 311</td>
<td>(209) (51)</td>
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<td>5</td>
<td>Install Specular Reflectors</td>
<td>21,967</td>
<td>655</td>
<td>73.5</td>
<td>A &amp; B 992</td>
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<td>5</td>
<td>Install High Efficiency Motors</td>
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<td>529</td>
<td>50.4</td>
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<td>5</td>
<td>Install Variable Speed Drive Controls</td>
<td>35,399</td>
<td>1,055</td>
<td>51.6</td>
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<td>14</td>
<td>Install Occupancy Sensors</td>
<td>10,232</td>
<td>305</td>
<td>32.0</td>
<td>A &amp; B 432</td>
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<tr>
<td>14</td>
<td>Convert Incandescent Fixtures To Fluorescent</td>
<td>21,795</td>
<td>649</td>
<td>45.1</td>
<td>A &amp; B 607</td>
<td>(595) (146)</td>
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<td>3</td>
<td>Install Separate A/C Units For OB Area and Surgery Suites</td>
<td>34,221</td>
<td>1,020</td>
<td>13.2</td>
<td>A &amp; B 191</td>
<td>10,780 2,641</td>
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</tr>
<tr>
<td>3</td>
<td>Install Vestibule Doors</td>
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</tr>
<tr>
<td>3</td>
<td>Replace Mercury Vapor Lamps In Exterior Lights With HPS</td>
<td>9,836</td>
<td>283</td>
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<tr>
<td>3</td>
<td>Install Electronic Controllers &amp; Control Devices In Patient Rooms</td>
<td>1,621</td>
<td>48</td>
<td>5.6</td>
<td>A &amp; B 76</td>
<td>1,988 487</td>
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<td>3</td>
<td>Utilization Of Solar Energy</td>
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<td>3</td>
<td>For Domestic Hot Water</td>
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<table>
<thead>
<tr>
<th>INSTITUTION:</th>
<th>COUNTY HOSPITAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUILDING:</td>
<td>COUNTY HOSPITAL</td>
</tr>
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</table>

### Notes:
- A & B indicates the savings are calculated for both A and B scenarios.
- The savings are calculated based on baseline energy consumption and the efficiency of the new equipment.
- The natural gas savings are calculated based on the energy consumption of the new equipment and the efficiency improvements.
- The table provides a summary of energy management projects analyzed for the County Hospital, including the expected energy savings and the estimated cost savings.
### SUMMARY OF PROJECTS ANALYZED – PART II

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<thead>
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<th>COUNTY HOSPITAL</th>
<th>COUNTY HOSPITAL</th>
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<tr>
<td></td>
<td>SAVINGS</td>
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<td>1/YR</td>
<td>MAT'L</td>
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<tr>
<td>MKC</td>
<td>42,375</td>
<td>15,947</td>
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<tr>
<td>MOE</td>
<td>2,231</td>
<td>1,600</td>
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<tr>
<td>MCG</td>
<td>2,724</td>
<td>1,294</td>
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<tr>
<td>MAC</td>
<td>9,500</td>
<td>18,500</td>
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<tr>
<td>ECW</td>
<td>3,190</td>
<td>160</td>
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<tr>
<td>EMB</td>
<td>8,760</td>
<td>438</td>
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<tr>
<td>EMZ</td>
<td>3,105</td>
<td>155</td>
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<td>MME</td>
<td>4,445</td>
<td>3,355</td>
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<td>MMS</td>
<td>7,428</td>
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<td>1,710</td>
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<tr>
<td>ECF</td>
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<td>MAC</td>
<td>29,412</td>
<td>28,105</td>
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<td>BOA</td>
<td>854</td>
<td>618</td>
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<tr>
<td>ECH</td>
<td>6,344</td>
<td>4,747</td>
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<td>MKT</td>
<td>19,745</td>
<td>9,404</td>
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<tr>
<td>RSW</td>
<td>8,519</td>
<td>8,280</td>
</tr>
</tbody>
</table>

*Indicate which projects are not recommended (Rec.) at this time.*

*Show all other energy savings in blank column.*

*(Coal, steam, LP, propane, etc.)*
## ENERGY BUREAU FINANCING PROGRAMS

<table>
<thead>
<tr>
<th>Participant</th>
<th># Participant</th>
<th>Dollar Amount of Improvements Expected</th>
<th>Dollar Amount of Identified Improvements Expected</th>
<th>Estimated Annual Savings of Identified Improvements</th>
<th>Dollar Amount of Implemented Improvements</th>
<th>Annual Savings From Implemented Improvements</th>
<th>Identified Improvements Remaining To Be Implemented</th>
<th>Total Improvements Remaining To Be Implemented</th>
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<tbody>
<tr>
<td><strong>ENERGY BANK</strong></td>
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<tr>
<td>Local Governments</td>
<td>79</td>
<td>$50,000,000</td>
<td>$1,399,000</td>
<td>$283,000</td>
<td>$299,000</td>
<td>$53,000</td>
<td>$1,100,000</td>
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<tr>
<td>Schools</td>
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<td>$70,000,000</td>
<td>$41,087,000</td>
<td>$6,848,000</td>
<td>$23,885,000</td>
<td>$3,561,000</td>
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<tr>
<td>Public School (1)</td>
<td>277</td>
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<tr>
<td>Private Colleges (2)</td>
<td>14</td>
<td>$10,132,000</td>
<td>$1,446,000</td>
<td>$5,779,000</td>
<td>$1,446,000</td>
<td>$963,000</td>
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<tr>
<td>Private Schools</td>
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<td>N/A</td>
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<tr>
<td>Hospitals</td>
<td>39</td>
<td>$70,000,000</td>
<td>$7,514,000</td>
<td>$922,000</td>
<td>$3,240,000</td>
<td>$516,000</td>
<td>$4,274,000</td>
<td>$66,760,000</td>
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<tr>
<td>Non Profit Organizations (3)</td>
<td>N/A</td>
<td>$70,000,000</td>
<td>$1,409,000</td>
<td>$237,000</td>
<td>$944,000</td>
<td>$144,000</td>
<td>$465,000</td>
<td>$69,056,000</td>
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<tr>
<td><strong>STATE FACILITIES</strong></td>
<td>7</td>
<td>$40,000,000</td>
<td>$60,933,500</td>
<td>$12,016,000</td>
<td>$27,419,500</td>
<td>$5,810,000</td>
<td>$33,514,000</td>
<td>$12,580,500</td>
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<tr>
<td>N/A</td>
<td></td>
<td>$300,000,000</td>
<td>$122,474,500</td>
<td>$21,752,000</td>
<td>$62,076,500</td>
<td>$11,132,000</td>
<td>$60,398,000</td>
<td>$237,923,500</td>
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</tbody>
</table>

1. The amount of improvements identified is taken from the energy audits.
2. $1,547,000 was implemented under the Institutional Conservation Program before the Private College Energy Bank Program was established.
3. The nonprofit program is operated by Midwest Power.
MEMORANDUM OF AGREEMENT

This Agreement, dated ________, 19____, between the Department of Natural Resources (DNR) and is entered into for participation in the Iowa Energy Bank Program (the Program). The Program allows entities (school districts, hospitals, municipalities, or other jurisdictions of the State of Iowa) to obtain energy efficiency improvements and meet the requirements of Iowa Code Sections 93.13 and 93.20 by providing assistance to finance and procure energy auditing and/or engineering services for comprehensive engineering analyses and to finance improvements for certain of its facilities.

In addition, the entity agrees as follows:

1. The entity shall provide or complete an energy audit in a form acceptable to the DNR.

2. The entity shall enter into a contract with an analyst pre-qualified by the DNR to procure a technical analysis as recommended by the DNR.

3. The entity agrees that:
   a. Operation and maintenance items identified in the comprehensive engineering analysis or energy audit have been implemented or a schedule for implementation has been or will be established;
   b. A DNR-approved energy accounting system will be established after acquisition, construction or installation of the recommended energy management improvements (EMIs); and
   c. It will provide the DNR with information concerning the EMIs acquired, constructed or installed, as reasonably requested by the DNR.

4. The entity shall provide a copy of each energy audit and/or comprehensive engineering analysis to the DNR for review and approval prior to financing EMIs.

5. The entity shall provide to the DNR, on the form provided in the Program Handbook, a list of the facilities subject to financing or implementation.

6. The entity shall pay Program Service Fees to the DNR relating to the establishment and operation of the Program. The entity shall pay to the DNR within six months following completion of the energy audit and/or comprehensive engineering analysis the amount set forth in the promissory note, which may be included in the permanent financing. Program Service Fees shall mean the amount computed in accordance with the fee schedule in the Program Handbook, current at the time of signing this agreement.

7. The entity shall provide all documents, data and other information required by the DNR; the Underwriter (Norwest Investment Services, Inc.); and the DNR’s Program Counsel (Ahlers, Cooney, Dorweiler, Haynie, Smith & Albee, P.C.) to facilitate financing of the EMIs. All applicable state and federal laws, regulations and rulings shall be followed. This shall only apply to entities seeking program offered financing.

The DNR agrees as follows:

1. To provide assistance in the procurement of energy audits and comprehensive engineering analyses.
2. To provide a review process for energy audits and comprehensive engineering analyses.
3. To maintain a listing of analysts qualified to complete comprehensive engineering analyses.
4. To coordinate all financial, legal and technical aspects of the Program.
5. To use its best efforts to facilitate and advance the Program purposes as outlined in the Program Handbook.

This agreement may be executed in any number of counterparts each of which shall constitute one and the same document.

By: ________________________________
Title: ______________________________
Date: ______________________________
Federal ID Number: __________________

DEPARTMENT OF NATURAL RESOURCES

By: ________________________________
Title: ______________________________
Date: ______________________________
When to Join the Iowa Energy Bank Program?

NOW