



**TL4EO: Describe and demonstrate one (1) CNO – influenced organization wide change.**

### **Organizational Wide Go- Green Campaign**

#### **Purpose and Background:**

Rita Smith DNP, RN, NEA-BC, CNO continuously strives to create an environment conducive to healing while also reducing environmental risk and contaminants. In 2009, Dr. Smith began an organization wide campaign to transform JCMC into an organization that focused on environmental welfare by implementing systems and processes to foster a “green living” culture. She initially began this movement with Steven Mosser, than Vice President of Facilities. At this time the JCMC was renegotiating the contract with the current waste disposal company. She collaborated with Mr. Mosser throughout the bidding process in order to ensure that the next contracted company would assist us in accomplishing the goal of “going green” and energy conservation. She finally succeeded in 2011 with the contracting of Stericycle.

Dr. Smith, in 2010, established and led a multidisciplinary task force, which would later be referred to as the “Green Team.” The primary focus of this team was to evaluate and implement environmental best practices to improve sustainability in key areas such as waste and risk compliance, management of multiple waste streams, efficient energy usage, safer chemicals, and efficient use of resources. Data collected on the various initiatives implemented in 2010 was used as baseline data to project goals for the following years (2011-present).

#### **Key Problems Identified:**

- No process established at JCMC to recycle plastic, glass, metal and paper
- No process established to recycle and reprocess items in the OR
- High cost of municipal and regulated medical waste disposal
- Need to increase regulatory compliance with disposal of hazardous medications

#### **Goals:**

- Increase the number of initiatives to reduce environmental waste and promote a “go green culture”
  - Reduce amount of regulated trash to achieve best practice and/or industry standards
  - Increase organization-wide recycling
  - Meet or exceed best practice and/or industry average for disposal of regulated medical waste
  - Increase the amount estimated waste diverted from landfills
- Increase organization wide cost savings from baseline and sustain over 3 years

**Participants:**

Interdisciplinary “Green Team” Membership 2010-2013			
Name:	Title:	Department	Years Served
Rita Smith RN	CNO – Team Leader	Nursing	2010-2013
Cheryl Owens RN	Director of Nursing/AVP	Nursing	2010-2013
Kelly Loo RN	Director of OR	Nursing	2012-2013
Lourdes Valdes	Manager	Human Resources	2010-2013
Mary Cataudella	VP	Human Resources	2010-2013
Steve Mosser	VP	Facilities/BioMed	2010-2011
William Cook	Executive Director	Facilities	2011-2013
Charlie Church	Director	Facilities	2011-2012
Wayne Griffith	Assistant Director	Environmental Services	2010-2013
Ribhia Abdelhady	Corporate Director	Laboratory Services	2010-2013
Chris Amato RN	Nurse Educator	Emergency Department	2011-2012
Erin Salmond RN	Nurse Manager	Critical Care	2013
Therese Boruta RN	Nurse Manager	Clinical informatics	2011-2012
Mike Curci PharmD	Corporate Director	Pharmacy	2011-2013
Tammy Pfiefel	Director	Volunteer services	2010-2011
Mary Plaskin RN	Practitioner	Infection Control	2010-2013
Alex Chapman	Consultant	Stericycle	2011-2013
Robert Ashe	Corporate Director	Food and Nutrition Services	2010-2013
Tara Mazzone RN	Manager	NICU	2010-2011
Maura Donahue RN	Educator	Nursing Education	2010-2011
Elizabeth Corshu	Educator	Nursing Education	2010-2011

**Methods or Approach:**

Under the direction of Dr. Smith, the interdisciplinary “Green Team” met monthly to prioritize and strategize the implementation of various initiatives to promote waste reduction and cost savings. As initiatives were introduced and implemented, individual task forces were developed. These teams presented their progress to the “Interdisciplinary Green Team” on a monthly basis. Dr. Smith assumed accountability for each of these initiatives and continued to inspire and motivate team members to consider and implement additional projects.

Initiatives & Timeline:

Initiative Title	Department	Collaborating Agency	Date of Process Implementation
Solvent Recycler	Laboratory	Biotech	2009
Energy Light efficiency (energy efficient lighting, fixtures, and automatic sensor light switches).	Environmental services	n/a	2010
Medical Equipment Reprocessing	OR	SterilMED	2010
Integrated Waste Stream Solutions (regulated) medical waste, recycling, municipal solid waste management)	Organization-wide	Stericycle	April, 2011
Pharmacy Waste Management program	Pharmacy/ Nursing	Stericycle	June, 2011
Macerators	ED and Critical Care	Vernacare Medical Pump	September 2012



Below is a summary of each project that has been ongoing from 2009 to present:

### Solvent Recycler

Early in 2009, under the leadership of Dr. Smith, the laboratory had concerns regarding the cost of disposal of their hazardous chemicals, for example, xylene, alcohol and formalin. They contacted a company called CBG Biotech in order to purchase a recycler which would enable them to reuse their hazardous chemicals. The goal was to reduce solvent purchases and costs relevant to waste disposal, handling and storage costs. Because of this process the laboratory is able to recover and reuse 90%-95% of these chemicals. A task force was assembled that included Dr. Smith, Ribhia Abedhady, Director of the Laboratory and Arlene Richman Account Manager of CBG Biotech. The initial cost for purchase of the recycling equipment was: \$24,510.00. See below for the Return on Investment:

Annual Cost Savings of the Recycling of Chemicals in the Laboratory	
Cost of Purchase and Disposal of Chemicals (prior to change)	Savings as a Result of Recycling
\$58,382.00/year	\$54,257.00/year

This results in an Average Monthly Savings of \$4,521.00 which is ongoing from the inception of the recycling program. The Return on Investment occurred in 5.4 months after purchase of the recycling machine.

### Energy Efficient Lighting

Early in the “Go Green” initiative, Dr. Smith investigated the option of improving lighting efficiency throughout the hospital. In 2010, the Green Team explored commercially available, cost effective lighting technologies that offer the best opportunities to achieve high energy savings and reduce hospital costs. In January 2010 all of the lighting fixtures were retrofitted with high efficiency electronic ballast bulbs. In addition, occupancy sensors with digital timers were installed in spaces that are frequently unoccupied such as restrooms and mechanical rooms. These sensors will cause dimmers and lights to shut off after five minutes of no occupancy. The installation of the new lighting in the mechanical rooms on the 1<sup>st</sup> and 3<sup>rd</sup> floors contributed to **35,100 kW-hr** and **\$4,684** of annual energy savings per year. Since this initiative began a total of **\$19,472** has been saved.

### Medical Equipment Reprocessing

In 2010, the interdisciplinary Green Team led by Dr. Smith explored utilizing a reprocessing approach to conserve valuable healthcare resources, reduce medical waste, and reduce equipment cost. Reprocessing includes converting single use devices into reusable devices that cost about 50% less than the cost of a new device. These reprocessed items are FDA regulated to ensure high quality standards. The medical equipment reprocessing task force comprised of members from Cardiac Catheterization Laboratory, operating room and gastrointestinal laboratory worked diligently since its inception in 2010 to improve and expand this service. For additional information please refer to [EP7EO](#), and [EP7EO – Supplemental](#). A table summarizing the results is listed below.

Year	Devices Reprocessed	Total Savings	Estimated Devices diverted from landfills	Estimated Waste diverted from landfills
2010	15,717	\$161,811	20,956 Units	6,205 Lbs
2011	17,413	\$171,638	23, 217 Units	6,832 Lbs
2012	22,906	\$261,191	30,541 Units	8,289 Lbs
2013	24,833	\$130,416	32,603 Units	4188 Lbs
Total:	80,869	\$725,056	107,317 Units	25,514 Lbs

### **Integrated Waste Stream Management**

In 2011, a heightened focus was placed on environmental safety, best practices, waste compliance and the management of multiple waste systems at JCMC. Dr. Rita Smith assembled the Green Team for a brainstorming session to determine what issues would be addressed. Dr. Smith’s major concern focused on the necessity of a hospital wide culture change and the implementation of methods to achieve that goal. The Team, directed by Dr. Smith, determined to collaborate with a corporate partner in order to assist with the development of a comprehensive program. Stericycle was contracted with the following goals: focus on the correct disposal of biohazard materials, waste segregation and regulated medical waste by type. The three waste streams to be addressed are Municipal Solid Waste (MSW) which incorporates ordinary trash, Recycling Program (Rcy) and Regulated Medical Waste (RMW) Complete reports of compliance findings are distributed to senior leadership and reviewed with the Infection Control Nurse, Victoria DeChirico MSN, RN, CIC.

In 2011, Problems included the improper segregation of medical waste and the lack of correct recycling. Dr. Smith spearheaded the following interventions:

- The placement of proper receptacles house-wide for the recycling of plastic and paper. These devices were placed in high occupancy areas, for example in lounges and patient waiting areas. They also placed “desk-top” cardboard recycling containers to ensure that receptacles would be accessible and convenient to everyone
- Massive education house-wide to include all nursing staff as well as all environmental personnel. This education highlighted the importance of the restriction of items to be placed in regulated medical waste. Environmental staff was educated on how to handle the RMW containers following disposal

The table below demonstrates environmental diversions from landfill, the amount in pounds of waste generated, and the cost savings resulting from proper waste disposal:

<b>Annual Environmental Usage</b>				
	<b>Municipal Solid Waste lb</b>	<b>Regulated Medical Waste lb</b>	<b>Recycling lb</b>	<b>Total lbs</b>
2011	1,114,245	213,426	334,770	1,662,441
2012	1,575,320	213,143	441,772	2,230,235
2013	1,835,840	188,346	561,766	2,585,472
<b>Environmental Diversions 2011-2013</b>				
	<b>2011</b>	<b>2012</b>	<b>2013</b>	
<b>Pounds of CO2 emissions prevented</b>	<b>18,233</b>	<b>17,968</b>		<b>15,387</b>
<b>Pounds of plastic diverted from landfill</b>	<b>32,288</b>	<b>30,823</b>		<b>26,397</b>
<b>Pounds of cardboard diverted from landfill</b>	<b>1,321</b>	<b>1,322</b>		<b>1,125</b>
<b>Annualized Spend on Three Waste Streams (MSW, Rcy, &amp; RMW)</b>				
<b>Annualized Spend in 2010 (Baseline)</b>	<b>Annualized Fee Paid to Company (2011, 2012, 2013)</b>	<b>Total Annual Savings</b>	<b>Total Savings (2011, 2012, 2013)</b>	
<b>\$342,586.00</b>	<b>\$270,648.00</b>	<b>\$71,938.00</b>	<b>\$215,814</b>	

### **Pharmacy Waste Management program**

In June of 2011, Dr. Smith initiated a meeting with Stericycle representatives, Michael Curci Pharm-D, Maura Donohue BSN, RN Nursing Education Specialist, and Maria DeVivo Pharmacist to institute a pharmaceutical waste management program in order to be compliant with recent legal mandates.

The pharmaceutical program outlined a method to classify and dispose of medications using a safe and systematic method. The system included the use of varied colored containers that are dependant on whether the disposed item is a hazardous, sharp, or regulated waste in accordance with the Resource Conservation and Recovery Act (RCRA). All patient care areas were provided with three containers, two black and one blue.

The waste management process begins in the pharmacy with the proper coding of each pharmaceutical dispensed to the patient care units. The coding involves the pharmacy placing a sticker on each item to insure proper disposal once the medication is on the units. If an item from the Pharmacy does not contain a waste code it defaults to the blue container (non-RCRA). Certain items were identified to be sent back to the pharmacy for proper disposal.

In June of 2011 a train the trainer program was instituted in order to educate Pharmacy, Environmental Services, Managers, Clinicians and all nursing units. The overall impact of this training had a positive effect and reinforced the proper disposal of all pharmaceuticals. Waste segregation compliance is assessed biannually and education is reinforced as needed.

### Macerators

Chris Amato, BSN, RN, CEN, A staff nurse from the Emergency Department presented the use of a macerator as an environmental green initiative for the ED. Rita Smith was extremely supportive and guided Ms. Amato in the evaluation and ultimate purchase of this equipment. She also guided Ms Amato in the development of a business plan to present to Value Analysis for approval. A task force was established with the main goal of changing the current practice of using plastic bedpans, wash basins, and urinals to a single use pulp disposal system. This system improves infection control standards while providing a more eco-friendly system of human waste management. The taskforce members included Dr. Smith, Chris Amato BSN, RN, CEN, Staff RN, Ed Hvitfelt, Director of Purchasing and Erin Salmond Manager of Critical Care.

After a thorough evaluation of the product and a review of potential return on investment, the first macerator was installed in the ED in August of 2012. Please refer to [TL2 – supplemental](#) for additional information. This initiative successfully reduced cross contamination and improved infection control practices by reducing the exposure of the nursing staff to human waste. Therefore, in April of 2012, two additional macerators were installed in the Intensive Care unit. Although the cost of usage in the ICU is greater, due to this being a single use product, versus a multi use product, Dr. Smith felt it was important to expand this to the ICU as an infection control safety measure. A table summarizing the results of this initiative is displayed below.

	Emergency Department	Intensive Care Unit
Annual Cost of Plastic products (Baseline)	\$4,814.35	\$2,799.60
Annual Cost of Vernacare Biodegradable products	\$2,940.00	\$4,814.35
Annual Savings	\$1,874.35	\$ -1,433.35

Annual Savings on Vernacare products	Estimated Annual Waste Stream Reduction	Plastic Waste Removal Cost savings	Total Annual Savings	Total Saving (2012-2013)
\$441.00	\$4,571	\$93.32	\$ 5,105.32	10,210.64

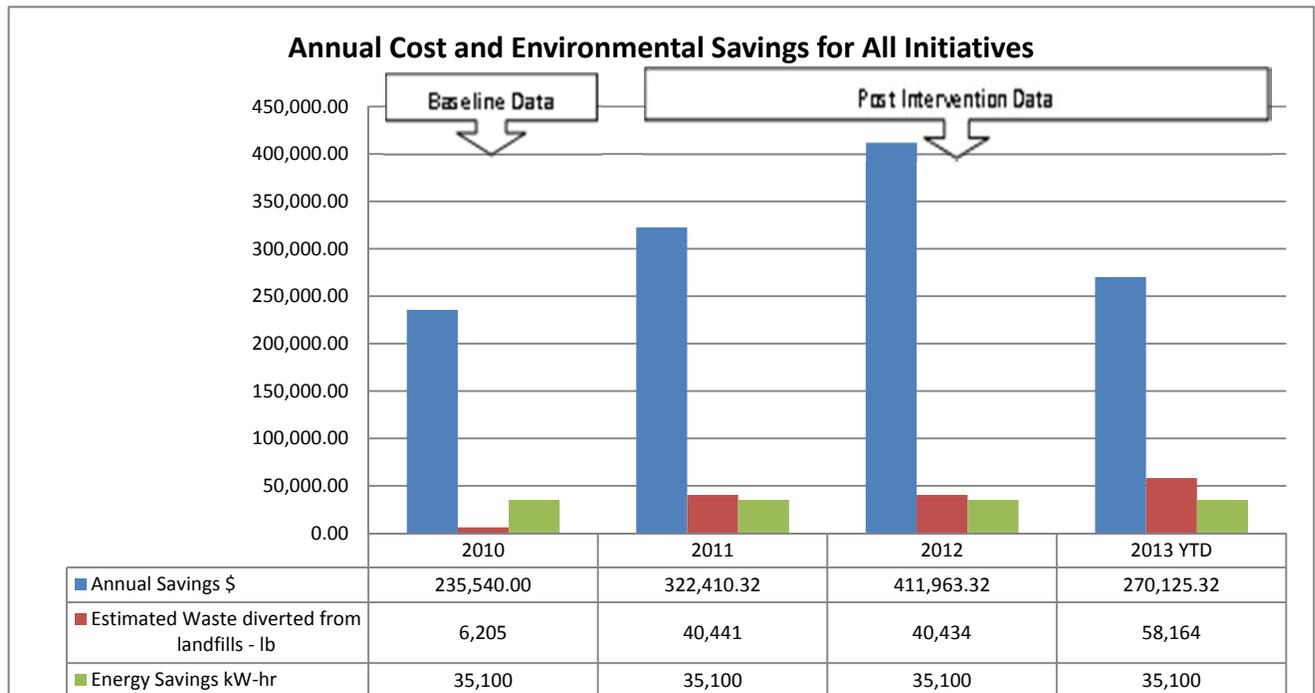
### Other “Go Green” Initiatives

During the post intervention period, Dr. Smith has promoted and organized many other initiatives that encourage a “green living culture” among employees, patients and visitors

Initiative	Roll out Date	Dr. Smith’s Role	Program Success
<b>Smoke Free Campus and “I Quit Smoking” Program</b>	Spring 2010	Assumed a leadership role in collaboration with Human Resources and Pharmacy to initiate, organize and roll out program  Designed educational program for employees	<ul style="list-style-type: none"> <li>• Ongoing communication and education provided to staff, patients, visitors and vendors regarding smoke free campus</li> <li>• “I Quit smoking program” - Pharmacology,</li> </ul>

Initiative	Roll out Date	Dr. Smith's Role	Program Success
		<p>and public by developing an educational pamphlet</p> <p>Ongoing monitoring in collaboration with security department to continuously monitor compliance of Smoke Free Campus</p>	<p>counseling, and medical testing provides a one-to-one approach using science based treatments to minimize tobacco withdrawal symptoms while maximizing tobacco withdrawal success</p> <ul style="list-style-type: none"> <li>• Program is free to all employees, their qualified dependents and the public</li> </ul>
<b>Serenity Rose Garden</b>	Spring 2011	<p>Encouraged employees to participate by strategically placing a "Go Green" suggestion box</p> <p>Auxiliary members expressed desire to plant and maintain rose garden, Dr. Smith assisted with location and approvals</p>	<ul style="list-style-type: none"> <li>• Planted by the JCMC Auxiliary in support of a serene environment</li> <li>• In 2013, Members of the Green Team, the JCMC Auxiliary, hospital volunteers, and employees revived the Serenity Rose Garden due to damage caused by Super Storm Sandy</li> </ul>
<b>Reduced paper and copy usage</b>	2011	<p>Dr. Smith influenced all organizational leaders to reduce paper and copy usage.</p> <p>Allocated resources for full time employee to place all unit policy manuals on the intranet</p>	<p>Campaign to reduce paper usage was introduced:</p> <ul style="list-style-type: none"> <li>• Policy manuals were placed on our liberty health intranet</li> <li>• Automatic generated reports are electronically submitted</li> <li>• Meeting minutes sent via email prior to schedule meeting dates</li> <li>• Committees and councils utilize projectors to display minutes, dash boards and other documents.</li> </ul>
<b>Reusable Mugs / Coffee Discounts</b>	2012	<p>Dr. Smith met with Bob Ashe Director of food services to initiate "Coffee Cup Refill Program"</p> <p>Allocated financial support from Medical Executive group for purchase of thermal beverage cup for all nursing personnel</p>	<ul style="list-style-type: none"> <li>• Discounts provided to employees when using reusable beverage cup in cafeteria</li> <li>• Reusable beverage cups provided during new hires orientation and during Nurses Week</li> </ul>
<b>Environmental friendly cleaning products</b>	2012	<p>Met with Wayne Griffith Director of Environmental Services, to substitute cleaning products/paper towels with the "Green Seal" label</p>	<ul style="list-style-type: none"> <li>• Environmental Services converted to environmental friendly "Green Seal Certified products" <ul style="list-style-type: none"> <li>○ Non ammonia products to clean glass</li> <li>○ Natural Cleaning product (Citrus Stride) to clean horizontal surfaces in office space</li> <li>○ 100% recyclable multifold paper towels, hand towels and bathroom tissue</li> </ul> </li> </ul>
<b>Earth Day Celebration</b>	April 23, 2013	<p>Sponsored and Supported house wide Earth Day Celebration.</p>  <p><i>Rita Smith CNO</i></p>	<ul style="list-style-type: none"> <li>• Members of the JCMC Green Team spent the day educating and demonstrating recycling options to help preserve the environment and reduce our environmental footprint</li> </ul>

## Organizational Wide Outcomes:



### Analysis of Baseline Data

In 2010, there were only three major green initiatives. These initiatives included the solvent recycler, energy light efficiency and medical equipment reprocessing. These three initiatives produced a total of \$235,540 in annual savings, 35,100kW-hr in energy savings and 6,206lb of waste diverted from landfills.

### Post Intervention Data

This data reveals how the “Green Team” led by Dr. Smith made substantial investments to transform JCMC into a workplace that is healthier, safe, and environmentally sustainable. As a result of the “Green Teams” work on these projects, Jersey City Medical Center received the Environmental Quality Award from the New Jersey Business & Industry Association on October 16, 2013. The below table demonstrates achievement of established goals set forth by Dr. Smith.

Goal	Baseline 2010 (pre-intervention)	Achievements (Post Interventions)	Best Practice and Industry Standards
Increase the number of initiatives beyond baseline to reduce environmental waste and promote a “go green culture”	3 major initiatives in progress	Four major initiatives implemented that effectively reduced environmental waste and cost saving  Six additional environmentally friendly awareness campaigns/ initiatives implemented	JCMC was awarded the Environmental Quality Award from the New Jersey Business & Industry Association signifying excellence in “Go Green” achievement
Reduce amount of regulated trash (MSW) to achieve best practice and/or industry standards	68%	<ul style="list-style-type: none"> <li>• 2011 - 67%</li> <li>• 2012 - 70%</li> <li>• 2013 - 71%</li> </ul> <i>* As regulated medical waste decreases municipal trash increases due to appropriate trash segregation</i>	<b>Best Practice:</b> meet or decrease below 68%  <b>Industry Average:</b> meet or decrease below 77%
<ul style="list-style-type: none"> <li>• Increase organization-wide recycling</li> </ul>	18%	<ul style="list-style-type: none"> <li>• 2011 - 20%</li> <li>• 2012 - 20%</li> <li>• 2013 - 24%</li> </ul>	<b>Best Practice:</b> meet or exceed above 24%  <b>Industry Average Practice:</b> meet or exceed above 8%
<ul style="list-style-type: none"> <li>• Meet or exceed best practice and/or industry average for disposal of regulated medical waste</li> </ul>	14%	<ul style="list-style-type: none"> <li>• 2011 - 15%</li> <li>• 2012 - 10%</li> <li>• 2013 – 7.0%</li> </ul> <i>*As municipal trash increases, regulated medical waste decreases due to appropriate trash segregation</i>	<b>Best Practice:</b> meet or decrease below 8%  <b>Industry average:</b> meet or decrease below 15%
<ul style="list-style-type: none"> <li>• Increase the estimated waste diverted from landfills</li> </ul>	6,205lb	<ul style="list-style-type: none"> <li>• 2011- 40,441lb</li> <li>• 2012 - 40,434lb</li> <li>• 2013 - 58,164lb</li> </ul>	N/A
Increase organization wide cost savings from baseline and sustain over 3 years	\$ 235, 540	<ul style="list-style-type: none"> <li>• 2011 - 322,410.32</li> <li>• 2012 - 411,963.32</li> <li>• 2013 - 270,125</li> </ul>	N/A

### Future Endeavors

As a future endeavor, the operating room is in the process of purchasing the Neptune2 for use in the surgical suites during procedures. The following is how the Neptune assists the hospital go green and cut costs:

1. The Neptune system is a closed suction system which replaces standard plastic canisters currently used on all surgeries. By using the Neptune device the hospital will decrease plastic use by 85% since plastic canisters will no longer be needed. These canisters end-up in landfills and are **not** biodegradable.
2. Our current plastic canisters are collected at the end of surgery. A solidifier is poured into the canister to harden the fluid inside. These are then placed in red bags and removed by a service from the hospital. The hospital is subsequently charged by the pound for the removal of red bags. Utilization of the Neptune

device eliminates the need to place canisters in red bags which will, in turn, reduce our removal cost by up to 90%.

3. Since the Neptune is a closed system there is no chance of spills, splashes or exposures to our staff. It is a safe, clean and green product instantly making the Operating Rooms a safer place to work.
4. Additionally, each Neptune unit contains its own smoke evacuator. Smoke plume will not be emitted into the environment further enhancing the safety in the operating room.
5. Because the Neptune holds 24 liters of fluid, the circulating nurse does not need to constantly change canisters during a busy high fluid case. He or she is free to do more productive tasks. This creates a faster procedure and drastically improves through-put and turnover time in the OR.

### **Projected Cost Savings on Solidifier and Canisters**

<b>Solidifier (2013)</b>	<b>Canisters (2013)</b>
\$73,796.17	\$28,764.00

**Projected Total Annual Saving: \$102,560.17**

The Laboratory is in the process of converting their glass blood culture bottles to plastic in order to reduce the weight of their regulated medical waste and therefore derive at a cost savings. Please refer to the table below for an analysis:

### **Bactec Bottle for Blood Culture Weight Measurement**

<b>Number of Bottles</b>	<b>Glass Bactec Weight</b>	<b>Plastic Bactec Weight</b>	<b>Weight Difference</b>
One (1) Bottle	149.0 grams	58.5 grams	90.5 grams
Two (2) Bottles (Set)	0.66 lbs (298.0 grams)	0.26 lbs (117.0 grams)	0.4 lbs (181.0 grams)
Total number of blood cultures bottles used per year (12,978)	8,565.48 lbs	3,374.28 lbs	5,191.20 lbs <b>(Savings)</b>
Price per lbs of RMW disposal=0.30	\$2,569.64	\$1,012.28	<b>(Savings)</b> <b>\$1,557.36</b>