

# Burnaby Hospital

## Summary of Waste Assessment

September 15, 2011

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## Executive summary

An assessment of the Burnaby Hospital recycling and general waste streams were carried out on September 15, 2011. The assessments were carried out by TRI Environmental Consulting Inc.

The purpose of the waste assessment was to:

- Determine the composition of solid waste currently being disposed of from the site
- Identify opportunities for further improving waste management systems at Burnaby Hospital in the future.

From a 24 hour time sample, 131kg of general waste randomly was selected and hand-sorted into 24 waste categories. The recommendations from the assessment were as follows:

- Undertake visual audits every two weeks for the first two months of the program, and monthly thereafter
- Undertake a full waste and recycling assessment fall 2012, six months after the implementation of the program.
- Report progress and provide further staff education at department meetings in addition to email, poster and newsletter communication as required. Education will focus on rationale and logistics of material segregation into appropriate recycling streams.
- Implement recycling renewal program in winter 2012
- Educate staff through newsletters, emails, on-site recycling displays, Recycling Champion training and unit specific in-services or meetings. Focus on where new bins are located and what materials can be recycled in which streams - stress the importance of segregation
- Investigate composting programs being undertaken at other sites and potential to introduce a program to Burnaby Hospital when time allows
- Educate staff on the importance of medical and biomedical waste going to regular garbage or biomedical waste streams, respectively
- Educate waste vendors on types of medical waste, providing details on what is hazardous and what is not, with the aim of increasing the types and volume of material able to be accepted for recycling

## **Introduction**

### ***Background***

A new recycling program for mixed paper, rigid and soft plastic, refundable beverage containers and glass will be set up at Burnaby Hospital in winter 2012. Recycling bins are located on site in centralized locations, however there is opportunity to increase the number of bins available. Materials currently being recycled include: old corrugated cardboard (OCC), mixed paper, rigid plastic, soft plastic, batteries, ink cartridges/toner, electronics and light bulbs. After the recycling program is implemented, the site will have an estimated 260 bins throughout the facility, collecting waste from each of the four new recycling streams.

This report outlines the objectives of the waste and recycling assessments; the methodology used in collecting and sorting the samples; the results of the assessments; and observations and recommendations.

### ***Objectives***

The waste assessment was undertaken in order to:

- Determine the composition of solid waste currently being disposed from the site
- Identify opportunities for further improving waste management systems at Burnaby Hospital in the future.

The next waste and recycling assessments will take place fall 2012 (six months after the implementation of the recycling program).

### ***Exclusions***

The focus of this assessment was to determine what is being disposed from the site as general waste (garbage). The assessment excluded the following types of waste and/or recycling (that is currently disposed of separately to general waste or plastic/paper recycling):

- Biomedical waste (sharps containers, yellow and red bags)
- OCC (old corrugated cardboard)
- Batteries
- Confidential shredding
- Electronics and furniture
- Organics from the production kitchen

### ***Caveats***

This waste audit was conducted by TRI Environmental Consulting. Audit results differed quite substantially from those done by the Recycling Team at other sites. A few reasons for this:

- Materials classified as Biomedical Waste by TRI would have been classified as Medical Waste in previous audits – data has been adjusted to reflect this
- Sample bags may not have been sorted as thoroughly as previous audits
- Garbage bags were included in the soft plastics category, rather than a separate category as in previous audits – data has been adjusted to reflect this
- Results are highly variable given the relatively small sample obtained for analysis relative to the amount of waste produced by the site
  - Based on previous audit results we suspect paper towel, medical plastics and medical waste are over-reported, while organics and plastic recyclables are under-reported.

## **Methodology**

### ***Personnel***

The waste and recycling assessments were undertaken by two sorters and one sort supervisor from TRI Environmental Consulting. Assistance with separating a valid waste sample was provided by ARAMARK's Operations Manager, housekeeping staff, Facilities Manager, Security and the Support Services Manager.

### ***Waste categories***

A total of 25 waste categories were selected by the audit team. These categories were established to allow for the identification of materials currently able to be diverted to recycling, and for additional materials that may be able to be diverted for recycling or composting in the future. A full list and description of the categories can be found in **Appendix A**.

### ***Waste assessment***

#### ***Set up***

"The waste bins at Burnaby hospital are located directly off the loading bay docks under a covered roof. The recycling bins are located approximately 25 m further away down a ramp or a set of stairs from this area and are not under a covered roof or loading dock area."<sup>1</sup>

Tables and sorting bins were set up in the undercover area of the loading bay.

#### ***Sampling***

A target sample size was determined in alignment with the BC Ministry of Environment, MJ Waste Solutions and Metro Vancouver. A sample size of 135kg was recommended to provide a reasonable level of accuracy in the types of waste typically disposed from the site. The actual sample size was 131kg.

"Approximately 24 hours before the waste sort took place at each hospital, the compacting waste bins on-site were replaced with approximately 30 yard non-compacting bins for the hospital staff to use as the main garbage bin. When TRI personnel arrived on-site the waste bins were full allowing TRI personnel to easily collect a representative 136 kg sample from the bin."<sup>1</sup>

Each category was weighed to provide information on the composition of the solid waste stream.

#### ***Recycling***

Recycling was not assessed as part of this audit. However the following observations were made: "Clear waste bags are used for recycling at the hospital. The recycling bins were full when the waste sort occurred. Some clear recycling bags were identified in the waste bin. It was raining at the time of the sort, and it would be necessary for staff to go into the rain to place recycling bags in the proper location."<sup>1</sup>

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<sup>1</sup> TRI Environmental Consulting Inc – Solid Waste Composition Study – Hospital Samples

## Results

This section summarizes the waste assessment findings and provides detailed results from each of the samples.

### Findings – General Waste

Table 1 presents a summary of the composition of the waste observed in the general waste stream. The data below is presented by category. Only those categories with associated waste are included in the table below.

**Table 1: Burnaby Hospital waste assessment data –September 2011**

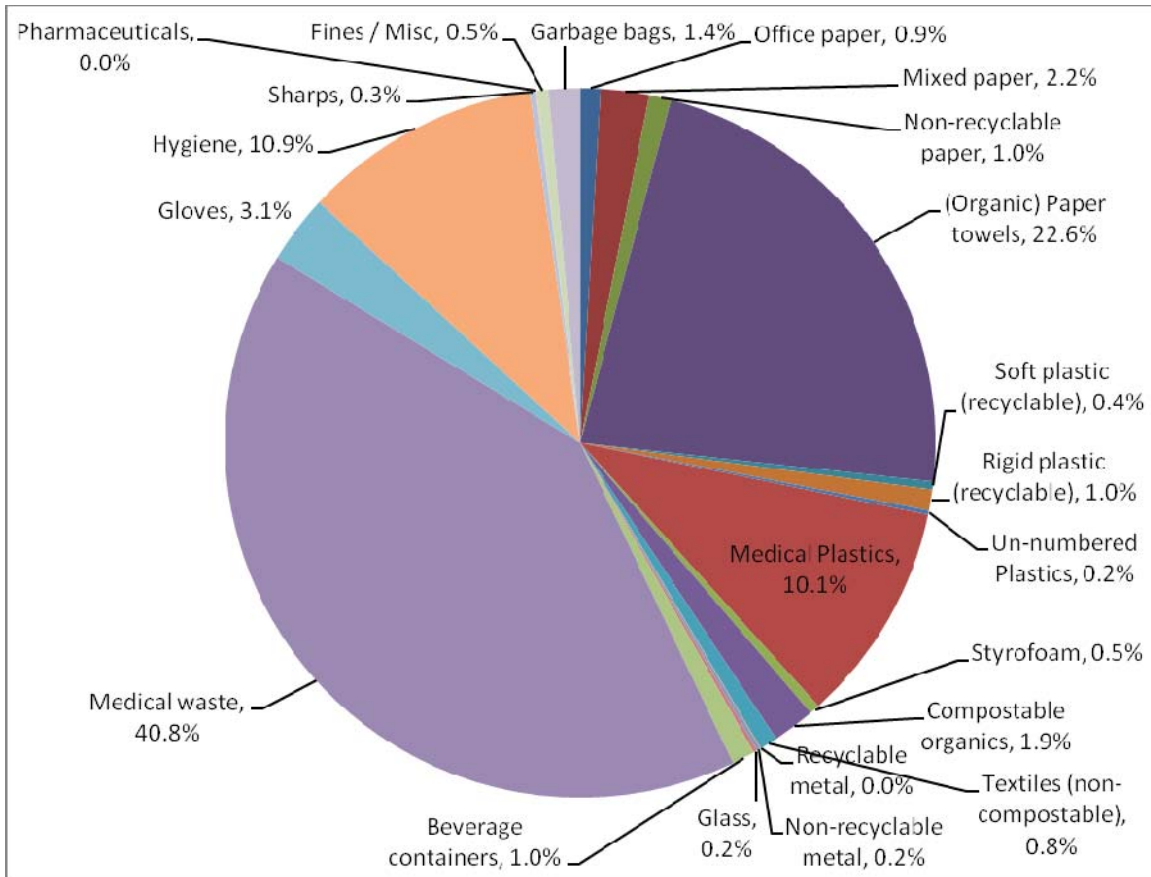
Material category	Percentage
<b>Paper</b>	
Office	0.9%
Mixed	2.2%
Non-recyclable	1.0%
Organic (paper towels)	22.6%
<b>Plastics</b>	
Soft (recyclable)**	0.4%
Rigid (recyclable)	1.0%
Rigid (un-numbered)	0.2%
Medical Plastics	10.1%
Styrofoam	0.5%
<b>Organics</b>	
Compostable organics	1.9%
Textiles (non-compostable)	0.8%
<b>Metals</b>	
Non-recyclable	0.2%
<b>Glass</b>	
Glass	0.2%
<b>Beverage containers</b>	
Beverage containers	1.0%
<b>Medical/hygiene</b>	
Medical waste*	40.8%
Gloves	3.1%
Hygiene	10.9%
<b>Hazardous</b>	
Sharps	0.3%
<b>Miscellaneous</b>	
Miscellaneous/fines	0.5%
Garbage bags**	1.4%
<b>Total</b>	<b>100%</b>

\*Combined the biomedical and medical waste categories from the TRI report.

\*\*Garbage bags and soft plastic were combined categories. Assumed 80% of soft plastic was accounted for by garbage bags as based on consultants estimate

Figure 1 below illustrates the proportions of different materials in the sorted waste stream.

**Figure 1: Breakdown of waste composition, Burnaby Hospital**



The data indicates that the largest proportions of the waste stream are comprised of medical waste (41%) and paper towel (23%). Medical waste includes IV bags with medication, tubing, soiled blue wrap, gowns, head and booty covers and face masks. The majority of these items were soiled with blood or bodily fluids.

A total of approximately 10% of materials found in the waste stream will be recyclable under the recycling renewal program implemented at Burnaby Hospital in spring 2012. Medical plastics accounted for 4%, mixed paper - 2% and soft plastic, rigid plastic, beverage containers, glass, office paper and cardboard accounted for < 1%. It should be noted that 60% of the medical plastics stream is accounted for by saline bags, which are not currently able to be recycled. If a composting program was in place a further 25% of materials could be diverted from the waste stream: paper towels (23%) and organics (2%).

Hygiene accounted for 11% of the waste stream and gloves 3%. These materials are not able to be recycled. Each of the other material categories comprised less than 2% of the total waste stream.

Based on previous audit results we suspect paper towel, medical plastics and medical waste are over-reported, while organics and plastic recyclables are under-reported.

**\*Note: Data has been adjusted from TRI consulting report – soft plastics has been adjusted to separate out garbage bags (80%) and biomedical waste was added to the medical waste category.**

## **Observations and recommendations**

All recommendations in this section would be carried out by Kate Searle and Christine Ronning, with support from BISS and Energy and Environmental Sustainability (Facilities Management).

### **Monitoring of recycling program**

The Burnaby Hospital recycling renewal program will be launched at the site in winter 2012. Regular waste and recycling audits will be carried out to monitor progress and identify any problems with the program.

#### ***Recommendations:***

- Undertake visual audits every two weeks for the first two months of the program, and monthly thereafter
- Undertake a full waste and recycling assessment fall 2012, six months after the implementation of the program.
- Report progress and provide further staff education at department meetings in addition to email, poster and newsletter communication as required. Education will focus on rationale and logistics of material segregation into appropriate recycling streams.

### **Recyclable materials**

As presented in the finding section of this report, the volume of recyclable material in the waste stream is approximately 10%. Although there is recycling in place across some departments within Burnaby Hospital, the implementation of the recycling renewal program in fall 2012 will increase the number of bins and types of materials that can be recycled. While the figures reported in the waste audit indicate a low proportion of recyclables in the garbage, we expect a significant increase in volume of recycling collected. This may not show in the waste audit data, given the discrepancies in the audit methodology.

#### ***Recommendations:***

- Implement recycling renewal program in winter 2012
- Educate staff through newsletters, emails, on-site recycling displays, Recycling Champion training and unit specific in-services or meetings. Focus on where new bins are located and what materials can be recycled in which streams - stress the importance of segregation

### **Compostable materials**

Introducing composting programs to Burnaby Hospital could remove over 25% of material from the general waste stream. A composting program could involve the collection of organics from any or all of the following areas:

- Food prep from the cafeteria
- Patient tray waste coming back to the food services kitchen
- Staff kitchens in clinical and administration areas
- Paper towels from major hand washing locations

#### ***Recommendations:***

- Investigate composting programs being undertaken at other sites and potential to introduce a program to Burnaby Hospital when time allows

## **Medical waste**

Non-hazardous medical waste comprised the largest proportion of the waste stream at 41%; when including the categories of gloves and hygiene, this proportion increases to 55%. Opportunities for reducing the volume of soiled medical waste are limited, and would require a full review of operational practices. Opportunities for reducing the volume of clean, unused medical waste are more readily available.

It is unclear how much medical waste observed in the waste stream was clean (or likely to have been clean when placed in the garbage). Educating both clinical staff and waste vendors on types and correct disposal of clean medical waste has the potential to reduce the total volume of waste.

### ***Recommendations:***

- Educate staff on the importance of medical and biomedical waste going to regular garbage or biomedical waste streams, respectively
- Educate waste vendors on types of medical waste, providing details on what is hazardous and what is not, with the aim of increasing the types and volume of material able to be accepted for recycling

## Appendix A – Waste Categories

Material Category	Description
<b>Paper</b>	
Office	Copy paper (confidential and non-confidential)
Mixed	Boxboard, newspaper, magazines
Non-recyclable	Coffee cups, paper contaminated with food
Old corrugated cardboard	Shipping boxes, containerboard cartons
(Organic) Paper towels	Paper towels
<b>Plastics</b>	
Soft (recyclable)	Plastic film, packaging or bags
Rigid (recyclable)	All rigid plastic 1-7
Rigid (un-numbered)	Plastics without a number on them
Medical Plastics	Syringes without needles, IV bags (no medication), rinsed urine bottles
Styrofoam	Styrofoam plates and cups
<b>Organics</b>	
Compostable	Food and plant waste
Textiles (non-compostable)	Wood, leather, rubber
<b>Metals</b>	
Recyclable	All types of metal food containers e.g. tin cans
Non-recyclable	All other metal materials e.g. foil packaging
<b>Glass</b>	
Glass	Material that can be identified as container glass. Includes glass food jars and medicine bottles.
<b>Beverage Containers</b>	
Beverage containers	All refundable ready to drink beverage containers (plastic, metal, glass, tetra-paks, cartons, juice bags)
<b>Electronic Waste</b>	
Electronic waste	Electronic materials including TVs, CPUs and components
<b>Medical/hygiene</b>	
Medical waste	Clean and soiled medical supplies including tubing, IV bags, blue wrap, head and booty covers, gloves, single-use scissors
Gloves	Clean and soiled nitrile/latex gloves
Hygiene	Human hygiene products including diapers and sanitary products
Biomedical waste	Human fluid blood and blood products, items saturated or dripping with blood, body fluids contaminated with blood and body fluids removed for diagnosis during surgery, treatment or autopsy
<b>Hazardous</b>	
Sharps	Needles
Pharmaceuticals	Medication in pill or liquid form
Batteries	
<b>Miscellaneous</b>	
Miscellaneous/fines	Materials that can't be categorized anywhere else
Garbage bags	Garbage bags