

Sustainable Laboratories at UHN

Ian McDermott

Research at

UHN



OCI

**Ontario Cancer
Institute**



TGRI

**Toronto General
Research Institute**



TECHNA



TWRI

**Toronto Western
Research Institute**



TRI

**Toronto Rehabilitation
Institute**

MEDRIST
Engineering organizations to navigate success

The largest research hospital in Canada!

UHN Toronto General
Toronto Western
Princess Margaret
Toronto Rehab

www.uhnresearch.ca

Research at

UHN

818,000
Sq Ft

2658
Publications

3953
Staff

333,215,953
\$\$\$

The largest research hospital in Canada!

Sustainability – Why?

"We do not inherit the earth from our ancestors, we borrow it from our children."

~Native American Proverb



The Toronto Medical Discovery Tower

@
MaRS

TMDT EXHAUST VOLUMES

- 12 Dedicated roof mounted exhaust fans for building and lab exhaust.



- Total building exhaust from the exhaust fans was sufficient to fill a blimp every minute.

Fume Hoods = Energy Guzzlers

One four foot fume hood uses 3.5X the energy of a average house!

Sustainability – What does it mean?

- Enabling research and laboratory operations
 - Responding to directional changes
 - Respond to regulatory changes
 - Creating environments that foster innovation
- Long term return on capital investment
 - Reduced financial burden of creating laboratories

Sustainability – What does it mean?

- Reduced operational costs
 - Rising utility costs
- Reduced impact to the users, visitors and the world in which we live
 - Reduced carbon emissions
- Establishing a ‘whole building’ approach to take advantage of synergies through operational opportunities, innovative products and new approaches

Research in a Sustainable Environment

McEwen Centre for Regenerative Medicine

- Innovative approach to healing
- Focuses on the natural mechanisms using the bodies own stem cells
- Develop new methods to heal damaged organs, tissues, cells and genes.
- Effective for
 - Cardiac, vascular, pulmonary, vision and neurodegenerative disorders, as well as spinal cord injuries, diabetes and cancer.

Why change the approach?

"Engineers believe that if it ain't broke, it doesn't have enough features yet."

Scott Adams *(Dilbert creator)*

Partnership vs relationship

Partnership

....a contractual relationship between two or more persons carrying on a joint business venture with a view to profit, each incurring liability for losses and the right to share in the profits

Relationship

....the mutual dealings, connections, or feelings that exist between two parties, countries, people, etc

Integrated Team Approach (ITA)



ITA for TMDT

The owner must provide a direct connection to the project for all members of the team.

Sustainable Environments

INVITING



INTERACTIVE

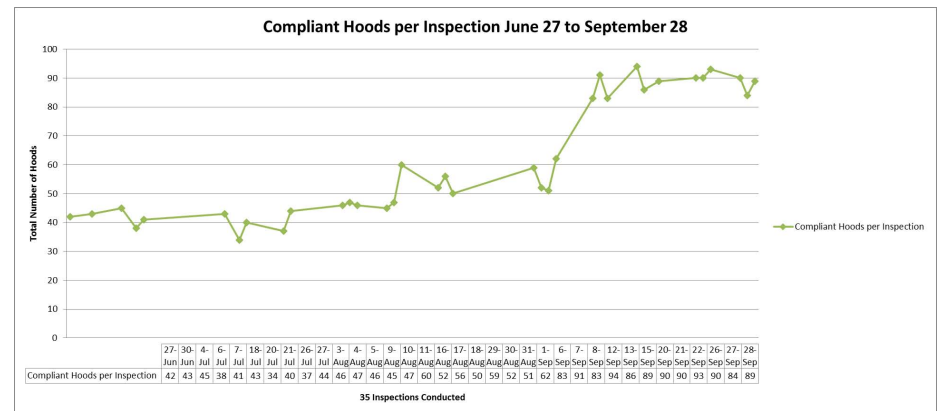


INNOVATIVE



Shut the Sash

- Education
 - Why bother?
 - Environmental impact, not financial gain.
- Incentivize
 - Pizza, Pizza, Pizza
- Measure
 - Weekly measurements



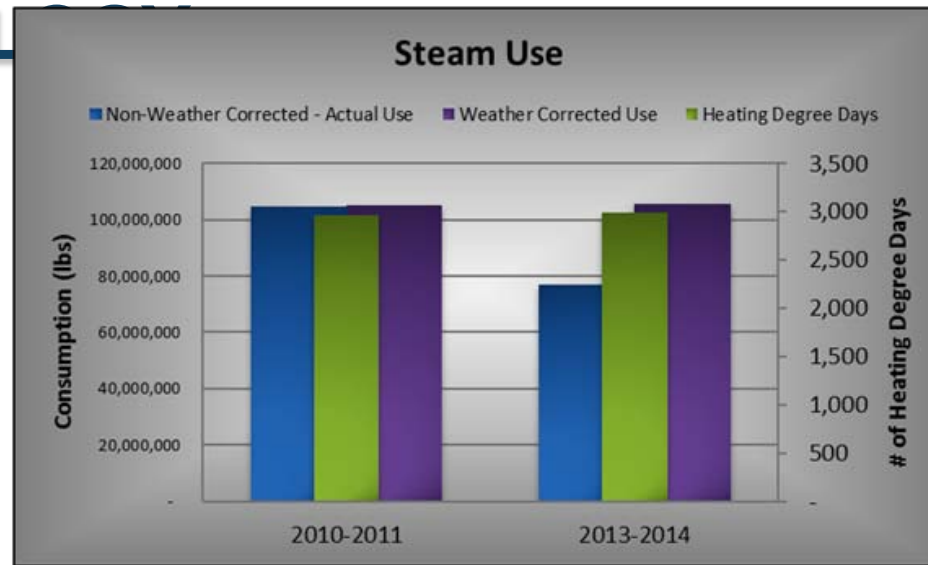
Optinet

Achieved sustainable success!

- Reduced Operating Costs
- Partnership approach
- Reduced Environmental Impact
- Quality Environment
- Innovation



BENEFITS OF A SUSTAINABLE PROCESS AND TECHNOLOGY



	2013-2014 (Predicted Cost)	2013-2014 (Actual Cost)	Savings in 2013-14
Steam	\$1,777,217.98	\$1,310,701.08	\$466,516.90
Electricity	\$3,353,533.64	\$2,977,325.28	\$376,208.72
Total	\$5,130,751.98	\$4,288,026.36	\$842,725.62

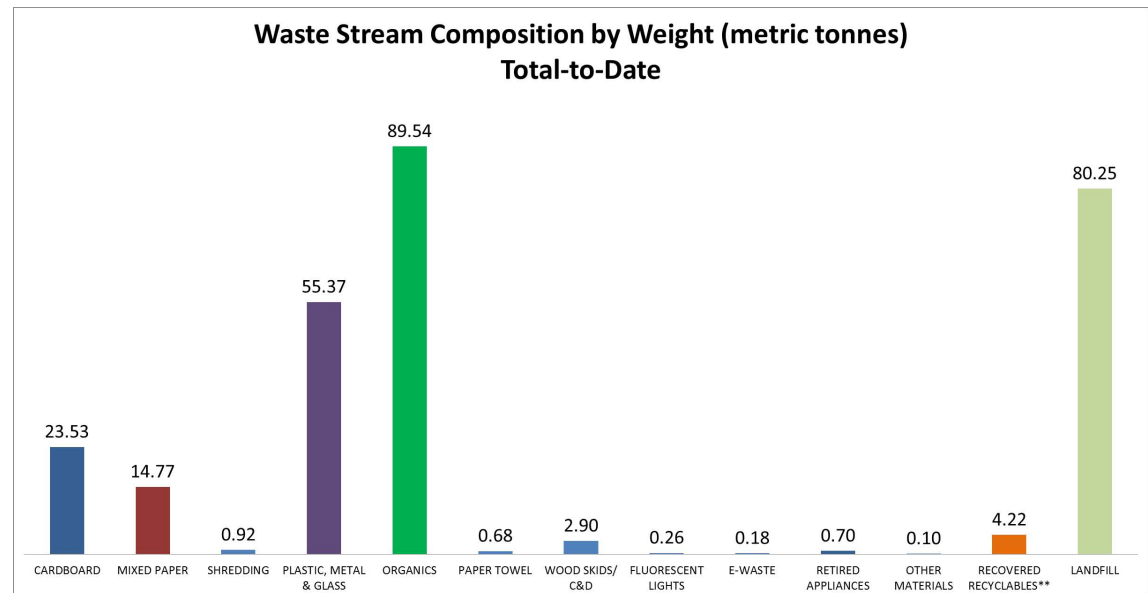
TMDT Waste Management

DIVERGENCE FROM LANDFILL

- 2011 – 54.6%
- 2012 – 68.3%
- 2013 – 72.5%
- 2014 – Target is 75%

WASTE STREAMS

- 13 Waste Streams



Sustainable Building



Krembil Discovery
Tower (KDT)

aka 'Venus'

@

The Toronto Western
Hospital



KDT - Sustainable yet simple ideas



- Open stairwell
- Bike room and showers
- Natural daylight harvesting
- Cistern



Life Cycle Management – Sustainable programs must be regularly managed

- One time capital cost vs ‘Cradle to Grave cost’
- 10 Year Facility Infrastructure Plan (Capital Replacement)
- Monthly review of Preventative Maintenance (PM) and Corrective Maintenance (CM)
- Annual Analysis of PM vs CM relative activities

Sustainable Culture doesn't just happen, it has to be created.



HARVARD
UNIVERSITY

Sustainability

'Top Ten Sustainable Lab Actions'

1. Shut the Sash
2. Mind your -80
3. Buy energy efficient equipment
4. Use less hazardous chemicals
5. Request Less packaging from vendors
6. Recycle
7. Swap equipment and supplies
8. Power down
9. Have a guide for best practices
10. Have a champion

Resistance to change is a reality. Be ready for it.



Who is killing my
nematodes?

C. Elegans – Nematode – used as a
genetic model for cell signalling
pathways in cancer



You don't develop courage by being happy in your relationships everyday. You develop it by surviving difficult times and challenging adversity.

Epicurus

It takes courage to change...

... and change is essential if we are
to become sustainable

