

City of Hamilton: Biosolids Environmental Management System (BEMS)



Presentation to: WEAO Biosolids Seminar

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Hamilton

Presentation Outline

- ✓ Background
- ✓ Why Hamilton embarked on a Biosolids EMS
- ✓ Ontario Biosolids Pilot Program
- ✓ Hamilton Expectations
- ✓ EMS Start-Up
- ✓ Implementation
- ✓ Current Status
- ✓ Program Resources



Background

- Hamilton's Population: 500,000
- 3 Wastewater Treatment Plants
 - Woodward Ave: 409 MLD
 - Dundas: 18.2 MLD
 - Waterdown: 2.7 MLD
- Biosolids Production: 36 dry tonnes/day



Background Con't...

- Switched from incineration to land application in 1996
- City's contractor responsible for all aspects of biosolids land application
- Minimal City involvement or oversight



Times are a changin'

- **Increased organized public opposition:**
 - Uncertainty related to impacts to public health and environment
- **Increased Owner Responsibility:**
 - To ensure contractor compliance
 - Ensure sustainable Biosolids program
- **New regulation changes:**
 - Nutrient Management Act





Ministry of the
Environment
Ministry of Agriculture,
Food and Rural Affairs



Hamilton

Golden Opportunities

- **Creation of Ontario Biosolids Partnership (OBP) through a Technical Steering Committee (TSC) comprised of:**
 - Ontario Federation of Agriculture
 - Ministry of Environment
 - Ontario Ministry of Agriculture & Food
 - Environment Canada - Great Lakes Sustainability Fund
 - City's of Hamilton, Ottawa, and Region of Halton
- **City's – Integrated Management System (IMS) initiative**

OBP / TSC

- Ontario piloting the EMS program developed by the U.S. National Biosolids Partnership (NBP)
- Create Ontario version of NBP guidance documents;
 - Manual of Good Practice
 - EMS Guidance Manual
 - Identifies examples of best management practices for biosolids processes and operations
- To guide the OBP through the objective, the team of CH2M Hill (Diamond Management, P.A. Consulting) was retained.



OBP / TSC - Role

- Provide guidance to municipal partners, including:
 - Assist municipality with formation of a Hamilton EMS team
 - Provide EMS training to the Hamilton program
 - Assist in preparing work plans
 - Quantify resources and benefits in completing an EMS
- Transfer EMS experience to other municipalities
- Solicit input from several stakeholders, including:
 - NGOs
 - Agricultural Organizations
 - Municipal Generators of Biosolids
 - Regulatory Agencies



Hamilton's Expectations From a BEMS

- ✓ Reduce program costs
 - Waste, energy, chemicals, contractor operations, product distribution
- ✓ Boost competitiveness
 - Cost controls, City image, access to capital, customer satisfaction, flexibility, biosolids acceptance
- ✓ Minimize risk; maximize performance
 - Show environmental commitment, reduce incidents, biosolids acceptance
- ✓ Improve government/public relations
 - Permits, authorizations, land application, public acceptance
- ✓ Optimize operations
 - All of the above, integrate processes; better environmental and operational solutions, better biosolids quality
- ✓ Do The Right Thing

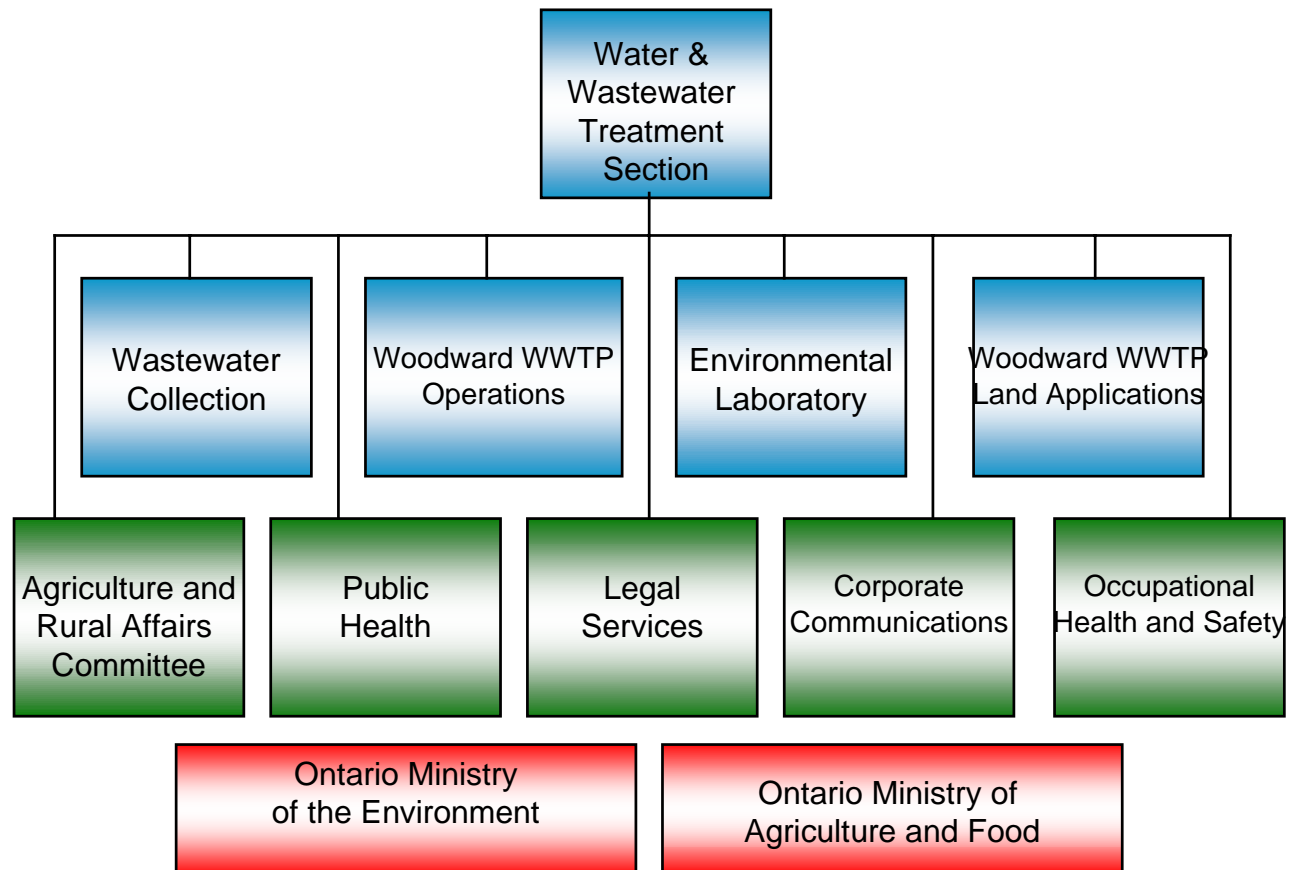


EMS Is Managing Your Biosolids Value Chain

- Biosolids value chain involves activities, events, etc. affecting biosolids quality and value to end user - the farmer
- “Chain” includes from source control through land application
- Controls all critical control points



Local Implementation Team



Synergies between City IMS & NPB/OBP

City IMS

- Lead by Earth Tech Canada
- ISO 14001, BSI 18001
- Public Works (including the Water & Wastewater Division)
- EMS & OHS Policies, Level 1 procedures, General Awareness Training, Compliance Audits

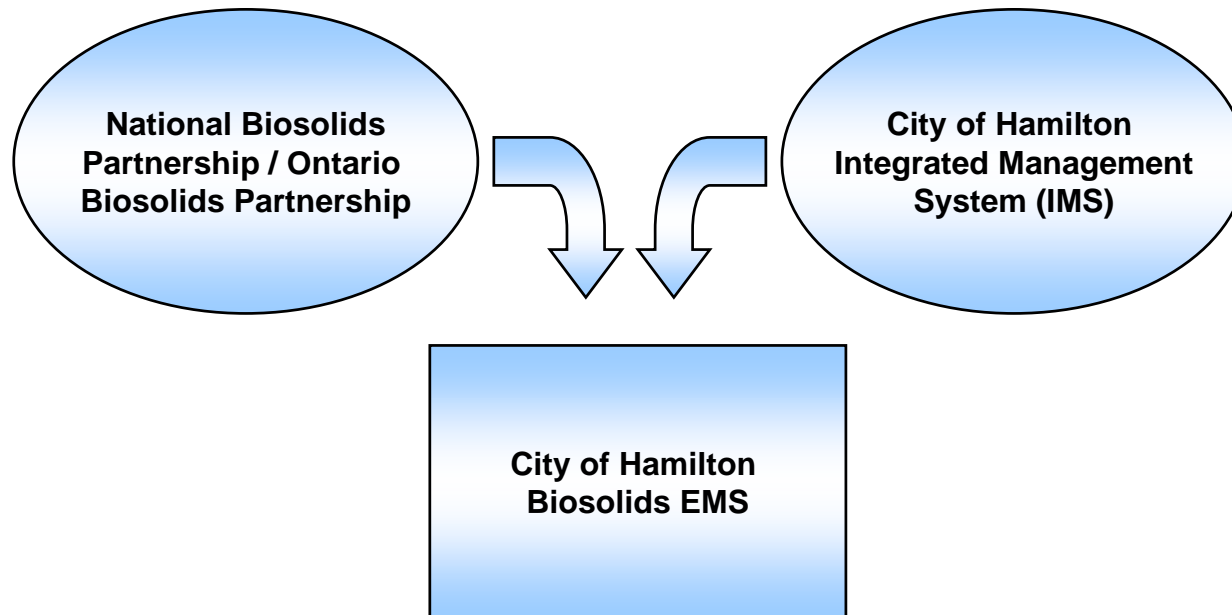
NPB/OBP

- ISO 14001
- Communications, Public Participation, Performance Reporting
- Water & Wastewater Division

Opportunity: As a result of efficiencies that could be attained through the City's IMS program, the City's IMS consultant was retained to assist the Water & Wastewater Division in implementation of the BEMS.



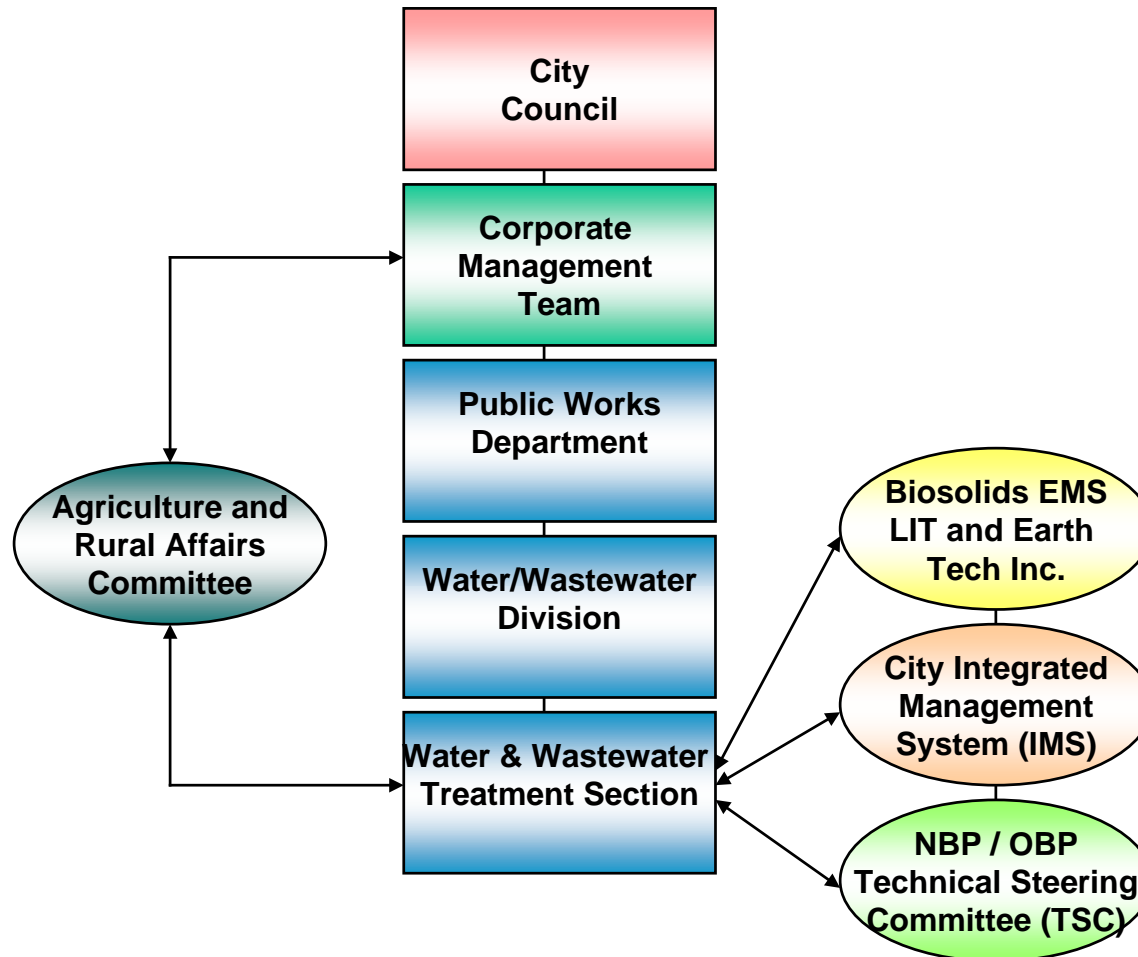
Links Between Initiatives



**Biosolids EMS integrates the NBP/OBP and
IMS**



Biosolids EMS Structure



Implementation Approach

- **Local Implementation Team (LIT)**
 - Review vision, mission, goals & objectives
 - Review ranking criteria & inventories
 - Review draft significant aspects & intolerable risks
 - Review objectives, targets, and management programs
- **Senior Management Team (SMT)**
 - Progress updates on BEMS program
 - Approving body for vision, mission, goals, objectives & targets, management programs, and procedure manual
- **Agricultural & Rural Affairs Committee**
 - Peer Review/ Advisory Group
 - Provide feed back & recommendations to program



Vision

“The City of Hamilton will have a sustainable biosolids management program that meets regulatory and other applicable requirements, protects occupational and public health and safety, protects the environment, is fiscally responsible, ensures service and product quality, and builds public and stakeholder acceptance”

Mission

“The City of Hamilton will achieve its biosolids management program vision by adhering to management standards, applying industry best practices, verifying system performance, implementing continual improvement, and proactively involving and sharing performance results with the public and stakeholders.”



Environmental Inventory - Ranking Criteria

LEGAL - Identifies whether impact is associated with government requirements.

- 1 No known legal, corporate, or other requirements
- 10 Known legal, corporate, or other requirements

FREQUENCY - Addresses how often an impact is likely to occur.

- 1 Very unlikely or has never occurred
- 3 Monthly to annual occurrence
- 5 Weekly occurrence
- 7 Daily occurrence
- 10 Continuous occurrence

SEVERITY - The degree to which the environment are affected by an impact.

- 1 No environmental affects
- 3 Minor environmental impact which can be mitigated
- 5 Minor permanent environmental impact
- 7 Major environmental impact which can be mitigated
- 10 Major permanent environmental impact

SCOPE – Environmental impact affects:

- 1 No impact to the environment
- 3 Immediate area impacted (within 10 meters)
- 5 Local area impacted (within 500 meters)
- 7 Neighbourhood area impacted (within 80 hectares)
- 10 Community (City of Hamilton)



Environmental Inventory Ranked

Facility	Activity (Major)	Activity (Minor)	Aspect	NOC/Emer/SD/SU	Impact	Legal	Frequency	Severity	Scope	Total	+/-	Public	Direct/ Indirect
330 Wentworth	Administration	Emergency - Fire	Loss of Documents pertaining to sewer use Enforcement and agreement information	E	Deleterious for sewer use enforcement, agreements, correspondence, company history and permit information	10	1	10	10	1000	-	N P	I
Wastewater Treatment Facility	Waste Activated Sludge Thickening Building (GBT)	Operations- Waste Activated Sludge	Emission to Air -Pollutants (Fugitive)	N O C	Contamination of Air- Pollutants (Fugitive)	10	10	3	3	900	-	P	D
Wastewater Treatment Facility	Primary Clarifier	Operation- Primary Clarifier	Emission to Air -Pollutants (Fugitive)	N O C	Contamination of Air- Pollutants (Fugitive)	10	10	3	3	900	-	P	D
Wastewater Treatment Facility	Final Clarifiers	Operation- Final Clarifiers	Emission to Air -Pollutants (Fugitive)	N O C	Contamination of Air- Pollutants (Fugitive)	10	7	3	3	630	-	P	D
Wastewater Treatment Facility	Aeration Tanks	Operation- Aeration Tanks	Emission to Air -Pollutants (Fugitive)	N O C	Contamination of Air- Pollutants (Fugitive)	10	7	3	3	630	-	P	D
Wastewater Treatment Facility	Methane Gas Storage	Transmission of Gas	Emission to Air - Pollutants (Stack)	N O C	Contamination of Air- Pollutants (Stack)	10	7	3	3	630	-	N P	D

Environmental Database- Control Method

Facility	Activity (Major)	Activity (Minor)	Aspect	NOC/Emer/SD/SU	Impact	Legal	Frequency	Severity	Scope	Total	+/-	Public	Direct/ Indirect	Method of Control			Comments
														Objectives & Targets	Operational Controls	Emergency Response Plan	
330 Wentworth	Administration	Emergency - Fire	Loss of Documents pertaining to sewer use Enforcement and agreement information	E	Deleterious for sewer use enforcement, agreements, correspondence, company history and permit information	10	1	10	10	1000	-	NP	I		R		Operational Control - Back up of records
Wastewater Treatment Facility	Methane Gas Storage	Transmission of Gas	Emission to Air - Pollutants (Stack)	NOC	Contamination of Air- Pollutants (Stack)	10	7	3	3	630	-	NP	D	R			Objective and Target - Reduction in Release of Greenhouse Gases
Wastewater Treatment Facility	Flame Flare	Operation-Flame Flare	Emission to Air - Pollutants (Stack)	NOC	Contamination of Air- Pollutants (Stack)	10	7	5	3	1050	-	NP	D	R			
Wastewater Treatment Facility	Waste Activated Sludge Thickening Building (GBT)	Operations-Waste Activated Sludge	Emission to Air -Pollutants (Fugitive)	NOC	Contamination of Air- Pollutants (Fugitive)	10	10	3	3	900	-	P	D	R	R		Operational Controls - Odour Masking System, Management of Odour Compliants, Objective & Target - Reduction in Odours (Measured at Property Line)
Wastewater Treatment Facility	Primary Clarifier	Operation-Primary Clarifier	Emission to Air -Pollutants (Fugitive)	NOC	Contamination of Air- Pollutants (Fugitive)	10	10	3	3	900	-	P	D	R	R		
Wastewater Treatment Facility	Final Clarifiers	Operation-Final Clarifiers	Emission to Air -Pollutants (Fugitive)	NOC	Contamination of Air- Pollutants (Fugitive)	10	7	3	3	630	-	P	D	R	R		
Wastewater Treatment Facility	Aeration Tanks	Operation-Aeration Tanks	Emission to Air -Pollutants (Fugitive)	NOC	Contamination of Air- Pollutants (Fugitive)	10	7	3	3	630	-	P	D	R	R		

Management Program Development



Significant Aspect / Intolerable Risk: *Emission to Air Pollutants (Stack)*

Objective: *Reduce emissions and increase reuse of methane gas generated at Woodward WWTP*

Target: *To be determined after compilation of baseline data*

Management Program: *Cogeneration / Steam Generation - Woodward WWTP*

Effective Date:

Task	Responsible Party	Schedule	Performance Monitoring	Key Characteristics / Operational Controls
Compile baseline data on quantity of methane gas emitted from flame flare / other emission points	BEMR	Ongoing	Monitoring & measurement analysis	Status of data
Technology Review - Technology Feasibility Study - Reuse of Methane Gas at Woodward WWTP Through Cogeneration/Steam Generation	BEMR	Feb. 2004	Terms of Reference / Project Schedule	Status of Technology Feasibility Study
Water and Wastewater Senior Management Review of Technology Feasibility Study	Senior Management Team	April 2004	Management Review Minutes	Review of Management Review Minutes

Where we are at Today

- Vision, mission, goals complete
- Hazard and risks inventory complete
- Management programmes under review
- Operational controls under review
- Internal audit program developed
- Internal auditors trained



Pending Activities – 2004

- Senior management review/approval
- System implementation (March – June)
- Internal audit program (June – July)
- External communication (2004)
- Provide ARAC with progress update



Key Challenges

- Ensuring stakeholder involvement
- Obtaining staff involvement/commitment
- Coordinating efforts with contractors
- Identifying hazards & risks
- Integrating existing procedures
- Raising awareness / knowledge



Key Successes

- Local Implementation Team (LIT)
- Heightened staff awareness and understanding
- Comprehensive system controls
- Integration with contractor systems
- Process for auditing performance



Lessons Learned

- Define scope from beginning
- Engage range of stakeholders
- Allocate sufficient staff/resources
- Ensure buy-in throughout process
- Process starts when BEMS complete



Implementation Resources

- **Synergies/efficiencies with City's IMS**
- **Water & Wastewater Section Staff**
 - Project Manager – 0.5 to 1 Days/week
 - Coordinator – 3 to 4 Days/week
- **Consultant Assistance**
 - 2 staff for approx. 800 Hours
- **LIT Resources**
 - **City Staff** : Collections, Lab, H&S, Envr. Planning, Legal, Communications, Public Health
 - **Contractor** : AWS Operations/Land Application
 - **Government** : MOE/OMAF



Questions...

