



From 1MW to 10MW: **1 order of magnitude, many challenges** **Walker Environmental**

Graham A. Guest, C. Tech.,
General Manager – Energy & Technical Services

- 130 acre landfill facility for non-hazardous solid waste
- Disposal Capacity
 - 10,000 tonnes/day
 - 1,100,000 tonnes / year
- Acceptable Materials:
 - Residential Waste
 - Commercial Waste
 - Industrial Residues
 - Demolition Debris
 - Contaminated Soils
 - Railway Ties



Waste Disposal

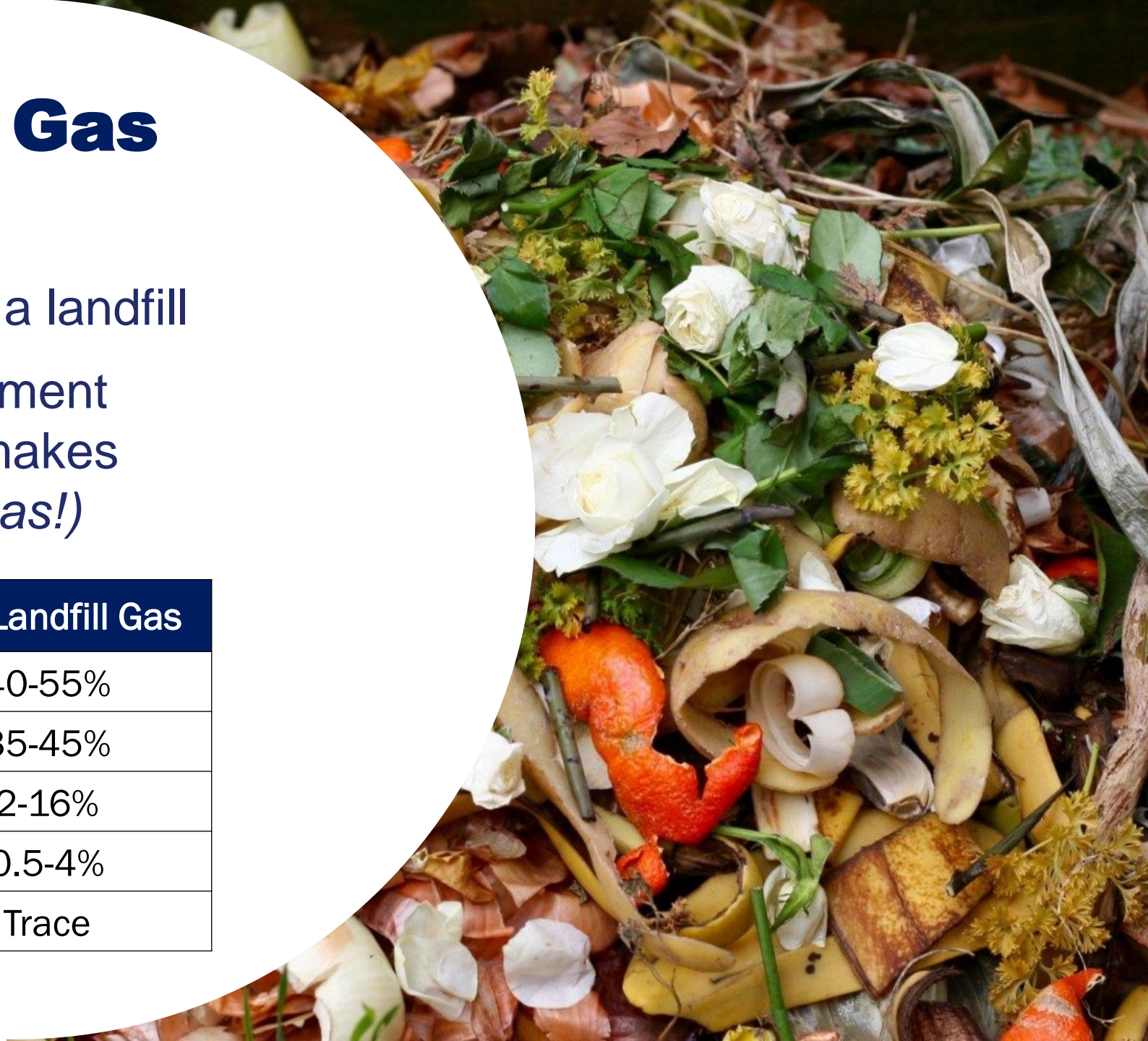
South Landfill – Niagara Falls, ON



What is Landfill Gas (LFG)?

- ▶ Organics break down in a landfill
- ▶ The low-oxygen environment means the breakdown makes methane (*AKA natural gas!*)

Constituents	% in Landfill Gas
Methane (CH ₄)	40-55%
Carbon Dioxide (CO ₂)	35-45%
Nitrogen (N ₂)	2-16%
Oxygen (O ₂)	0.5-4%
H ₂ S, Siloxanes, NMOCs	Trace





Landfill Gas Collection

- ▶ Landfill gas collection wells are installed in the landfill as it's filled
- ▶ The wells are all connected to the landfill gas plant, which pulls the gas toward it like a vacuum
- ▶ Gas can then be directed to different uses
- ▶ Landfill gas wells are regularly “tuned” to make sure we are collecting as much as possible



Generate Electricity

At our Niagara operations we have two generators:

- 1 megawatt to the electrical grid, powering our community
- 1 megawatt “behind the meter” powering our landfill gas plant



Renewable Natural Gas (RNG)

We use about 900 PJ of Natural gas per year in Ontario

- 400 PJ is direct purchase by large commercial and industrial users, 500 PJ (500 Million GJ) for homes and businesses.
- Renewable Natural gas is methane, which makes it a direct replacement for fossil natural gas



So, how do we make this order-of-magnitude change?

- *Be ready for the next opportunity*
- *Pay attention to policy signals*
- *Know your regulations*
- *Invest in people*



Lots to Think About:

- *Do NOT underestimate the challenges of complexity*
- *Unconscious Incompetence*
- *It will take longer than you think*
- *Be ready*



RNG PROJECT OVERVIEW



- ▶ LFG to RNG facility currently under construction
- ▶ Will produce nearly 1 million GJs of renewable energy per year
- ▶ Largest project of its kind in Province of Ontario
- ▶ Added new wells to landfill to maximize gas extraction and utilization



The RNG Project

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Thank You

Graham A. Guest
gguest@walkerind.com