A Sustainability Primer • LEED for Landfills • TIFs: Part 2

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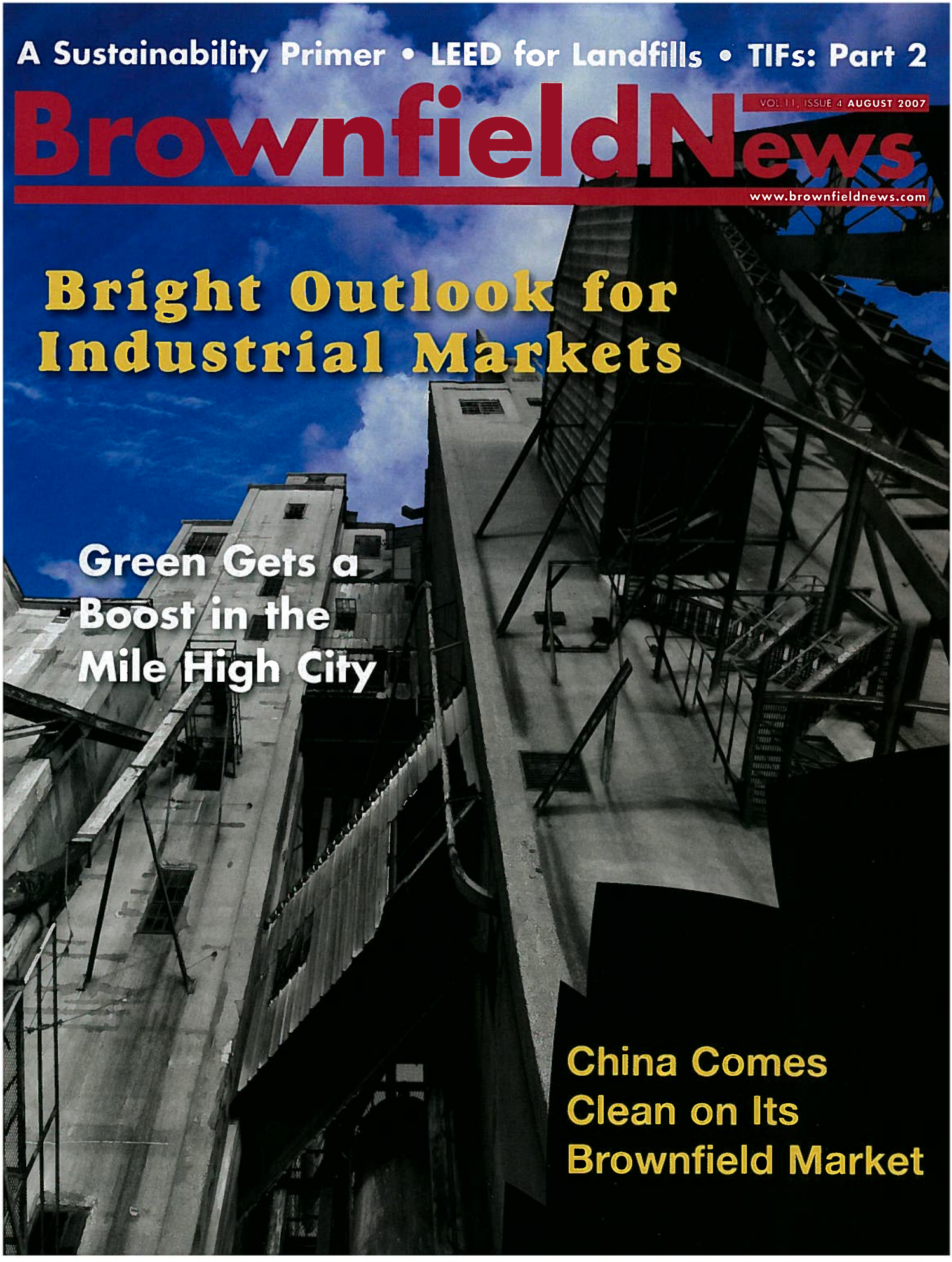

## Bright Outlook for Industrial Markets

## Green Gets a Boost in the Mile High City

## China Comes Clean on Its Brownfield Market

BFNews

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*Carbo-Sil, Niagara Falls, N.Y., by Sean Galbraith, www.SMLG.ca*



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**ON OUR COVER:** *CANADA MALTING COMPANY SILOS IN TORONTO, BASED ON AN IMAGE BY URBAN FINE ART PHOTOGRAPHER SEAN GALBRAITH, WWW.SMLG.CA. THE COMPANY'S OPENING IN 1928 MARKED THE ARRIVAL OF THE FIRST GRAIN SHIPMENTS INTO TORONTO HARBOUR IN NEARLY 20 YEARS, AND IS CONSIDERED A MILESTONE IN THE HISTORY OF CANADIAN CIVIL ENGINEERING TECHNOLOGY. ITS HISTORY IS REFLECTIVE OF THE EMERGING TERTIARY INDUSTRIAL MARKETS FEATURED IN OUR COVER STORY ON PAGE 14.*

SPECIAL REPORT

# Landfills and LEED Certification

By Jeffrey D. Marshall, P.E., and Michelle Leonard, P.E.

Since the 1990s, solid waste landfills, originally located at the outskirts of growing metropolitan areas, have been attracting the interest of developers. As growth has radiated from town centers, closed landfills are now often the largest undeveloped tracts of land in neighborhoods considered prime locations for manufacturing and industrial facilities, retail malls, warehouses and distribution centers, and other land-hungry projects.

Coincident with the increased interest in landfill redevelopment, the U.S. Green Building Council (USGBC) developed Leadership in Energy and Environmental Design (LEED) certification in 1998. Many government agencies and organizations have developed incentives and requirements for LEED certification of new privately and publicly owned construction projects. Some areas offer tax breaks, others financial incentives.

LEED for New Construction and Major Renovations is a rating system designed to guide and distinguish high-performance commercial and institutional projects, with a focus on office buildings. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health, and identifies specific credits that can be achieved in each area:

- Sustainable Sites: 14 possible points
- Water Efficiency: 5 possible points
- Energy and Atmosphere: 17 possible points
- Materials and Resources: 13 possible points
- Indoor Environmental Quality: 15 possible points
- Innovation and Design: 5 possible points

Basic LEED certification requires a minimum of 26 points. By incorporating additional green features, higher levels of certification are awarded, including Silver (33 to 38 points), Gold (39 to 51 points) and Platinum (52 to 69 points).

Because redevelopment atop closed landfills requires that a variety of unique challenges be evaluated during the feasibility, planning, design, construction, and operation phases, there is an opportunity to gain additional points. These can include, but are not limited to:

- Brownfield Redevelopment: Includes sites where environmental contamination has been documented, or that have been defined as brownfields by a local, state or federal government agency.
- Stormwater Design: Innovative management systems that minimize stormwater runoff and route stormwater outside the waste mass, minimizing percolation through the waste and preventing groundwater contamination.
- Innovative Wastewater Technologies: If the groundwater beneath the landfill requires remediation, a variety of innovative in-situ technologies (e.g., bioremediation, permeable reactive barriers) are available to restore the aquifer, as well as wetlands, as a component of treatment.
- Water Use Reduction: If an active pump-and-treat system is installed to remediate contaminated ground-water, the treated water can be used for irrigation, cooling water or process water, thereby reducing the burden on the municipal water supply system.
- Onsite Renewable Energy and Green Power: Landfill gas can be utilized onsite to fuel boilers, space heaters and micro-turbines for electrical production.
- Construction Waste Management: In some instances, landfill developments will require excavation of significant amounts of existing waste for utility trenches, structures and foundations. Recovery of recyclable materials may be practical, particularly at Construction and Demolition Debris landfills. It may be possible to process the materials at the site for use as fill or aggregate.
- Construction Indoor Air Quality Management Plans: Used during the construction phase of the project to consider the need for landfill gas (LFG) management and controls.
- Indoor Chemical and Pollutant Source Control: LFG control systems assist in achieving this requirement to minimize exposure of building occupants to potentially hazardous chemical pollutants.
- Innovation in Design: Other site-specific factors, including innovative foundation designs that are compatible with decomposing solid waste and differential settlement, may provide up to five additional LEED points.

Landfill redevelopment projects have faced unique challenges prior to LEED. And solutions to some of them have been successfully identified, designed and implemented. But we should look at these challenges as a way to provide increased opportunities for gaining points toward LEED certification, while demonstrating a commitment to green building and sustainability. **BFN**

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