

# The Sustainable Sites Initiative™: Potential impacts for water resources and site development

Robert F. Brzuszek, Mississippi State University

The Sustainable Sites Initiative (SITESTM) is a new national effort to create voluntary guidelines and benchmarks that promote sustainable land design and construction practices. Jointly sponsored by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center, and the U.S. Botanic Garden; SITESTM provides a ranking system that awards points for comprehensive sustainable land practices for built projects. The program is complementary to LEED® (Leadership in Energy and Environmental Design) Green Building Rating System, and it is anticipated that the SITESTM criteria will be incorporated into future versions of LEED®.

SITESTM has nine areas of focus—hydrology, soils and vegetation, materials, monitoring, operations and maintenance, construction, pre-design assessment, site selection, and human health and wellbeing. The program promotes examples of sustainable practices and awards up to 250 possible points for a project. A maximum of 44 possible points can be awarded for water practices. Credits are given for the following activities that protect and restore the processes and systems for a site's hydrology:

- Reduce potable water use for landscape irrigation
- Protect and restore riparian, wetland, and shoreline buffers
- Rehabilitate lost streams, wetlands, and shorelines
- Manage stormwater on site
- Protect and enhance on-site water resources and receiving water quality
- Design rainwater/stormwater features to provide a landscape amenity
- Maintain water features to conserve water and other resources

This paper will provide an overview of the Sustainable SITES Initiative with a focus upon how the program will ensure the protection of water quality in developed projects. Implications and incentives for planners, landscape architects, engineers, developers, builders and other professionals in the state of Mississippi to take part in the program will be discussed.

Key words: Best management practices, development, program

## Introduction

Being green is in. Market analysis conducted within the past decade has shown a positive growth in environmentally friendly products and services. Reena Jana wrote in *Business Week* (2007) of the significant economic potential of “designing, selling, or funding inventive eco-friendly products and services.” Thomas L. Friedman, New York Times columnist and Pulitzer Prize winning author, goes one step further to claim that “living, working, designing, manufacturing and projecting America

in a green way can be the basis of a new unifying political movement for the 21st century” (2007). The Lifestyles of Health and Sustainability index (LOHAS), conducted by the Natural Market Institute, is one measure of sustainable living and centers upon categories that include health and fitness, the environment, personal development, sustainable living and social justice in the United States (Natural Market Institute 2010). LOHAS estimates that in 2008, some 43 million consumers spent over \$200 billion dollars in green products and services (O'Shei 2010). For

green building products between 2003 and 2005, there was a 35% increase in ENERGY STAR qualified product purchases (ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy that evaluates and promotes energy efficient products and practices), a 15% reduction in synthetic building materials, and a 10% increase in products from that occur from natural resources.

Concurrent with this growth in green marketing is a growing public distrust in the 'green' claims and advertising of American companies. Termed 'greenwashing', these deceptive practices for marketing products as being environmentally sensitive when there is no evidence it can actually decrease sales of green products, create mistrust of green marketing, potentially increase federal regulations, and slow sustainability efforts (Horiuchi and Schuchard 2009). The press coverage of companies that use greenwashing in their business practices have risen dramatically. In 2006, there were less than 500 articles printed that used the term 'greenwash', and in 2008 over 2,500, a 500% increase (Horiuchi and Schuchard 2009). To meet this growing public distrust of advertising in the green market, green product certifications have also grown. Currently, there are over 400 green certification systems that offer a third-party validation of a product's green qualification (Zimmerman 2005). The Federal Trade Commission is responsible for regulating marketing claims in the United States, but has pursued few cases against the environmental claims of companies (Lukovitz 2010). In addition to external validation, green certification systems also 1) provide frameworks for identifying and implementing sustainable strategies, 2) provide benchmarks for measuring commitment to sustainability, and 3) rewards clients who make good environmentally-sound decisions.

Currently, registering for green certification is conducted on a voluntary basis. Individuals, companies, and non-profit organizations can apply to granting agencies to register their product or services. Just a few examples of green certifications for building products include (Zimmerman 2005):

1. Green Seal. Governed by the Green Seal organization, this certification covers products such as paints, windows, doors, and coatings. The manufacturer submits a request for certification and tests are conducted to meet performance criteria. Products must be recertified annually.
2. Greenguard. Administered by the Greenguard Environmental Institute, this certification is for paint, textiles, wallcovers, flooring ceilings, and insulation. Independent labs test submitted products for airborne chemical emissions. Products must be recertified annually.
3. SmartWood. Conducted by the Forest Stewardship Council, this certification assures that wood originates from certified forests. It covers any wood that is used in manufacturing and is certified by SmartWood and Scientific Certification Systems.
4. Green Label. Administered by the Carpet and Rug Institute, this program certifies carpet, adhesives and cushion materials for indoor air quality. The products are tested by laboratories for chemical emissions.

### **LEED®**

Perhaps the best known green building certification program is LEED®, Leadership in Energy and Environmental Design. Established in 1998, LEED® was developed by the U.S. Green Building Council (USGBC 2010). LEED® is recognized internationally and provides external verification that buildings and communities are designed with improved performance in green building design, construction, operations and maintenance. In 2002, LEED® was described as "the common benchmark for sustainability" (Applegath and Wigle 2002). Metrics were developed to improve energy savings, water efficiency, CO<sub>2</sub> emissions reduction, improved indoor environmental quality and stewardship of resources (USGBC 2010). LEED® accredited buildings can be found in all 50 U.S. states and in 91 countries, and currently encompass over 19,000 built projects (USGBC 2009).

*The Sustainable Sites Initiative™: Potential impacts for water resources and site development*  
Brzuszek

LEED® appears to be effective. In a study of 60 completed LEED® certified buildings, researchers found an improved energy efficiency averaging between 25% and 30%, as well as other substantial benefits (Kats 2003). Building costs can increase up to 2 percent more for LEED® certified buildings, but it has been demonstrated that the resulting decreased energy bills saves money over the life-cycle of the building (Kats 2003B). LEED® (2009) offers a rating system of 100 possible points that a building can achieve. These points can qualify for up to four levels of LEED® certification, including:

1. Platinum (80 points or more)
2. Gold (60 to 79 points)
3. Silver (50-59 points)
4. Certified (40-49 points)

Points are awarded for five major categories that include site planning, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality (LEED® 2010). The site planning category awards points primarily for the immediate footprint of the building, but it also recognizes some best management practices that accommodate local ecosystems and waterbodies, regionally appropriate landscaping, stormwater management, and energy. But LEED® does not adequately address the full scope of a project site, and weakly defines open space and animal habitat for site evaluation (Holmes 2009). Thus, LEED® has primarily been used to certify buildings and neighborhoods, but not for larger landscapes that may or may not include buildings.

### **Sustainable SITES™ Initiative**

To address this, the Sustainable Sites Initiative (SITES™) certification system was modeled after LEED® and created to “promote sustainable land development and management practices to sites with or without buildings” (SITES™ 2010). This includes any built landscape which will be protected, developed or redeveloped for public or private uses. Examples of such projects may be “commercial or public areas, parks, campuses, roadsides, residential landscapes, recreation areas or utility corridors” (SITES™ 2010). SITES™ was formed in 2006 as a partnership between the American Society

of Landscape Architects, the Lady Bird Johnson Wildflower Center, and the U.S. Botanical Garden. Comprised of technical subcommittees, over 50 experts developed sustainable benchmarks for landscapes. The subcommittees released their first interim report in November 2007. To better improve the landscape benchmarks for future iterations of LEED®, the USGBC is currently working to incorporate additional site credits from the Sustainable Sites Initiative (Westmiller 2010).

SITES™ uses a 250 total point system that a project site can achieve. The four levels of certification include:

1. 1 star = 100 points (40% total possible attainment)
2. 2 stars = 125 points (50%)
3. 3 stars = 150 points (60%)
4. 4 stars = 200 points (80%)

SITES™ utilizes the United Nations (1987) definition of sustainability as to “meet the needs of the present without compromising the ability of future generations to meet their own needs.” The underlying premise behind the certification system is that any site of any size, and in just about any condition, has the potential to be improved in its ecological function (SITES™ 2009). SITES™ is organized into nine categories:

1. Site selection (21 possible points) - selection of locations to preserve existing resources.
2. Pre-design assessment and planning. (4 possible points). – planning for sustainability from the beginning of the project
3. Site design – water (44 possible points) - protect and restore process and systems associated with site hydrology
4. Site design – soil and vegetation (51 possible points) – protect and restore processes and systems for a site’s soil and vegetation
5. Site design – materials selection (36 possible points) – reuse/recycle existing materials and support sustainable practices
6. Site design – human health and well-being (32 possible points) – build strong communities and a sense of stewardship
7. Construction (21 possible points) – minimize effects of construction activities

8. Operations and maintenance (23 possible points) – maintain the site for long-term sustainability
9. Monitoring and innovation (18 possible points) – reward exceptional performance and improve knowledge of sustainability

As SITES™ allows for a maximum of 44 possible points to be awarded for improved project site water practices, this may be a suitable evaluation system for municipalities, planners, developers, builders, architects, engineers, or landscape architects to use to meet Phase II Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System requirements. Credits are given for the following activities that protect and restore the processes and systems for a site's hydrology:

- Reduce potable water use for landscape irrigation (50-75% reduction)
- Protect and restore riparian, wetland, and shoreline buffers
- Rehabilitate lost streams, wetlands, and shorelines
- Manage stormwater on site
- Protect and enhance on-site water resources and receiving water quality
- Design rainwater/stormwater features to provide a landscape amenity
- Maintain water features to conserve water and other resources

Examples of how these can be categories can be achieved are outlined as follows (SITES™ 2009). All submissions for certifications must provide documentation that verifies attainments:

1. Reduce potable water use (50% or 75% attainment) for landscape irrigation (after initial plant establishment). The purpose of this is section is to reduce the need and excess use of drinking quality water or local water body sources for landscape irrigation. Documentation is required to be submitted for baseline landscape water requirement (the calculated water requirement for a non-sustainable similar-size landscape) and the designed landscape water requirement (calculated water requirements based upon the project design). Reductions can be at-

tributed to:

- Plant species factor
- Irrigation efficiency
- Use of captured rainwater
- Use of air-conditioner condensate
- Use of recycled graywater
- Use of recycled wastewater
- Use of blowdown water from boilers and cooling towers
- Use water treated and conveyed by a public agency specifically for non-potable uses.

2. Protect and restore riparian, wetland, and shoreline buffers. The intent of this section is to preserve or enhance riparian or wetland buffers to improve flood control, water quality, control erosion, and provide wildlife habitat and corridors (SITES™ 2009). Reductions can be attributed to the preservation and restoration of the riparian, wetland, or shoreline buffer on the site, and designate it a vegetation and soil protection zone. Points are assigned on the final average buffer width. The restoration must include:
  - Stabilization of stream channel or shoreline. Bulkheads are not an acceptable stabilization measure for this credit, and,
  - Re-vegetation with native plant communities.
3. Rehabilitate lost streams, wetlands, and shorelines. These credits allow rehabilitation of ecosystem functions for streams or wetlands that have been artificially modified. Points are given for the percentage (30, 60, or 90%) of full stream/wetland length to a stable condition using geomorphological and vegetative methods. Documentation must provide the existing conditions and historic wetland edge, and a description of the rehabilitation plan.
4. Manage stormwater on site. The purpose of this section is to replicate the historic hydrologic condition of the site. This uses a modi-

fied TR-55 method. TR-55 (Technical Release 55) offers simple procedures to calculate stormwater runoff, peak discharge, and storage volumes for small watersheds and is a standard in the engineering industry. The purpose of this method is to restore the water storage capacity of the project site. Points are awarded upon the difference between what the existing water runoff site conditions are to the proposed design. Provisions are made for sites that are either greyfields (sites that have been previously developed or graded) or brownfields (sites with environmental contamination).

5. Protect and enhance on-site water resources and receiving water quality. The purpose of this credit is to minimize or prevent pollutants from stormwater of project sites to receiving waters. It is required that documentation be provided that all construction materials and maintenance activities were selected to minimize stormwater pollutants. Points are awarded based upon the amount of runoff that is treated for pollutants before it discharges off-site (80% to 100%). Potential technologies and strategies to achieve this include (SITE<sup>™</sup> 2009) :
  - Implement strategies to reduce the volume of stormwater runoff, such as:
    - Reduce impervious cover
    - Disconnect impervious cover
    - Provide depression storage in the landscape
    - Convey stormwater in swales to promote infiltration
    - Use biofiltration to provide vegetated and soil filtering
    - Evapotranspire (e.g., use engineered soils and vegetation on green roofs or in biofiltration areas/landscaping to maximize evapotranspiration potential)
    - Infiltrate stormwater (infiltration basins and trenches, permeable pavement, etc.)
  - Materials used in building, hardscape, and landscape materials that can be a source of pollutants in stormwater include:
    - Copper and zinc roofs, roof gutters and downspouts, and siding
    - Galvanized materials (fences, guardrails, signposts)
    - Treated lumber
    - Parking lot coal tar sealants
    - Fertilizers
    - Pesticides.
  - Plan for and implement maintenance activities designed to reduce the exposure of pollutants to stormwater, such as:
    - Minimizing exposure to rainfall of stored materials that could contribute pollutants
    - Developing and implementing a spill response plan
    - Avoiding non-stormwater discharges (e.g., wash water)
    - Minimizing the use of salt for deicing
    - Avoiding routine maintenance of construction equipment on site to reduce pollutant loadings of oils, grease, hydraulic fluids, etc.
6. Design rainwater/stormwater features to provide a landscape amenity. The intent is to integrate the stormwater features into a visible and aesthetic way. Stormwater management is required to be incorporated into the site maintenance plan, and the all water is to be treated as an amenity to be available to site users. Points are awarded for the total percent of rainwater/stormwater features that are designed as amenities (50%, 75%, or 100%). Artists and craftsmen are encouraged to collaborate with the stormwater design team.
7. Maintain water features to conserve water and other resources. The purpose of this section is to ensure that all designed water features will minimize use of potable or



natural surface waters. Documentation must be provided to show that all created water features will not negatively affect receiving water, and the design must be incorporated into the site maintenance plan. Points are awarded for the percents achieved of sustainable water sources (rain capture, etc.).

### Discussion

LEED® and SITES™ are both voluntary reporting systems that are used at the discretion of the client. LEED® has established itself as a popular eco-labeling program that 'doubles as a marketing and policy tool' (Dickens 2003), and there are now over 50,000 LEED® accredited professionals (LEED® 2010). Although it's still a voluntary program, government agencies (federal, state, county and municipal), building owners, and the public are increasingly requiring or requesting its implementation (Black 2007). The pending merger of LEED® and SITES™ will expand the popularity of the green building concept to better represent the sustainability of the entire project site. As this happens, SITES™ will also inherit the criticisms of LEED®, some of which include not managing for what was proposed in the certification and that some criteria are too vague (Alter 2009). However LEED® is continually being revised and refined to address these problems. While it is true that relying on a checklist of items still won't accomplish the true breadth of what makes a project sustainable, it is still better than the alternative of no quantitative criteria being used at all.

### References Cited

1. Alter, L. (2009). The four sins of LEED® washing: LEED® green buildings that perhaps aren't really green. *Design and Architecture*. Retrieved at <http://www.treehugger.com/files/2009/03/the-four-sins-of-LEED®-washing.php>
2. Applegath, C. and Wigle, J. (2002) Turning Green. *Health Facilities Management*. October 2002.
3. Black, S. (2007). LEED® certification is here to stay. *St. Paul Business Journal*. August 13, 2007.
4. Dickens, K. (2003). A label and the able: LEED® is becoming a popular tool, but it's not the whole toolbox - sustainable & attainable. *Engineered Systems*, Sept. 2003.
5. Friedman, T. (2007). The Power of Green. *The New York Times*. April 15, 2007. Retrieved at: <http://www.nytimes.com/2007/04/15/magazine/15green.t.html>
6. Holmes, D. (2009). Feature: Interview with Jason King. *World Landscape Architect website*. August 12th, 2009. Retrieved at URL: <http://www.worldlandscapearchitect.com/interviewjasonking>
7. Horiuchi, R., and Schuchard, R. (2009). Understanding and Preventing Greenwash: A Business Guide. BSR.
8. Jana, R. (2007). The Business Benefits of Going Green. *BusinessWeek*. April 15, 2007., Retrieved at URL: [http://www.businessweek.com/innovate/content/jun2007/id20070622\\_491833\\_page\\_2.htm](http://www.businessweek.com/innovate/content/jun2007/id20070622_491833_page_2.htm)
9. Kats, G. (2003). Green building costs and financial benefits. *Massachusetts Technology Collaborative*.
10. Kats, G. (2003B). The costs and financial benefits of Green Buildings. A Report to California's Sustainable Building Task Force.
11. Lukovitz, K. (2010). New 'Green' Ad Claim Regulations Coming Next Year. *Green Clean Certified*. Retrieved at <http://www.greenclean-certified.com/green-cleaning-health/green-watch/FTC-Reviews-Guidelines-for-Green-Claims/>
12. Natural Market Institute (2010). Online version, URL:<http://www.nmisolutions.com/>
13. O'Shei, P. (2010). Green Design & Growth: Making the Business Case. Retrieved at, URL: <http://www.slideshare.net/charlesevan/green-design-growth-making-the-business-case>
14. Sustainable Sites Initiative™ (SITES™). (2010). Retrieved at URL: <http://www.sustainable-sites.org/about/>
15. Sustainable Sites Initiative (SITES™). (2009). *The Sustainable*
16. Sites Initiative: Guidelines and performance benchmarks 2009.

*The Sustainable Sites Initiative™: Potential impacts for water resources and site development*  
Brzuszek

17. United Nations. (1987). Report of the World Commission on Environment and Development. A/RES/42/187.
18. U.S. Green Building Council (USGBC). (2010). Retrieved at URL: [https://www.usgbc.org/FAQConsolidation/FAQ\\_Detail.aspx?id=Q501400000009vBfAAI](https://www.usgbc.org/FAQConsolidation/FAQ_Detail.aspx?id=Q501400000009vBfAAI)
19. U.S. Green Building Council (USGBC). (2009). Green Building by the Numbers. Green Building Facts. USGBC.
20. Westmiller, R. (2010). LEEDing the way into the future. Irrigation and Green Industry. July 13, 2010
21. Zimmerman, G. (2005). The Rise and Significance of Eco-Labels and Green Product Certifications. Facilities Operating Management. July 2005.