



For more information on One and Two Potomac Yard, please visit:

- <www.epa.gov/greeningepa/facilities/hq-nova.htm>
- <www.wbdg.org/references/casestudies.php>
- <www.eere.energy.gov/buildings/database/index.cfm>



U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460
EPA-200-F-06-001
July 2006

Acknowledgements

EPA would like to acknowledge Crescent Resources LLC and the U.S. General Services Administration for their support and information provided to complete this report.

Sustainable Facilities and EPA: One and Two Potomac Yard Arlington, Virginia



Building Achievements:

- 27 percent of building materials contain recycled content (value of post-consumer content plus half of post-industrial content as percentage of total cost of materials).
- 35 percent recycled content (approximately 670,000 pounds of ground granulated blast-furnace slag) was used in portions of the below grade, poured-in-place concrete structure.
- 63 percent of materials were manufactured regionally within a 500-mile radius.
- 61 percent of the regionally manufactured materials were also extracted regionally.
- 83 percent of wood-based materials and products were certified by the Forest Stewardship Council.
- 71 percent of construction period waste was recycled, diverting 2,000 tons from landfills.
- 41 percent water use reduction was achieved through water-saving technologies.

How Can a Speculative Building be Modified to Meet LEED Environmental and Energy Efficiency Standards?

EPA leveraged many of its sustainable requirements through a competitive lease SFO, allowing bidders for both existing and new build-



ings the latitude to choose LEED points to best meet the stated environmental performance criteria. Because the Potomac Yard facility was partially designed and not yet constructed, modifying the mechanical, electrical, and plumbing systems was more feasible than many buildings. Strategies used at Potomac Yard that can be considered for retrofits in other existing buildings include the use of more efficient HVAC units, lower wattage/higher output light fixtures, water efficient bathroom fixtures, sustainable plantings, recycled content/energy efficient/low-VOC building and finish materials, and "green" maintenance and operations products.



Lessons Learned

In a speculative building, frequent contact and a good rapport with the developer are extremely important. LEED certification requires teamwork and careful planning. For Potomac Yard, at least eight LEED-Accredited Professionals participated on the project team, minimizing the time needed for research and education.

Enforcing implementation of sustainable requirements during construction can be difficult, so the developer created a quality control program, including frequent field inspections and regular meetings with various stakeholders (EPA, GSA, Arlington County, operations/maintenance, health and safety, security, and LEED/sustainable design program office teams.)

Incorporating LEED and ENERGY STAR certifications into a speculative building is an achievable goal. Through commitment of all team members working together, the building was able to attain the sustainable attributes identified in this report, while maintaining reasonable costs and schedules.

Vital Statistics

Facility Type: Office Space

Construction: Leased/New Construction

Location: Arlington, Virginia

Size: Approximately 650,000 gross square feet (EPA leasing 405,117 square feet) on 2.9-acre site

Occupancy: 1,650 EPA employees (expected)

Opened: May 2006

LEED® Status: Gold

LEED (New Construction version 2.1) Points Submitted:

44 of 69 possible (Building One)

43 of 69 possible (Building Two)

By the time a tenant decides to lease space in a new, speculative office building, one often assumes the building may be too far along in the design and construction process to take into account additional building requirements without costly modifications. Speculative buildings are designed to meet mainstream needs, and generally do not contain features perceived to add cost and time, such as sustainable performance criteria, the U.S. Green Building Council's Leadership in Energy and Environment Design (LEED) certification, and the ENERGY STAR® label.

EPA's new home in One and Two Potomac Yard, however, is an example of how a speculative building can be transformed into a more sustainable facility. The Solicitation for Offers (SFO) for the facility was written to include environmental provisions developed by EPA. These provisions requested that the facility represent the Agency stewardship role to promote energy and water efficiency and environmentally preferable materials and design. At the time of the Potomac Yard procurement, EPA required all of its new major leases and construction meet the minimum LEED Silver certification and attain an ENERGY STAR label, among other sustainable criteria.

The winning developer, Crescent Resources, LLC, not only transformed Potomac Yard into a more sustainable facility, meeting EPA's requirements, but also attained even more LEED points through further design development and construction procurement strategies to achieve Gold certification. This brochure highlights the facility's achievements and implementation strategies.





On December 20, 2005, EPA signed a three-year **green power** contract (procured through the Defense Energy Support Center) for its then-current and soon-to-be-completed Northern Virginia office. Annual delivery of 4.2 million kilowatt-hours (kWh) in the form of renewable energy certificates (RECs) began on February 1, 2006. This purchase helps meet EPA's Headquarters Environmental Management System (EMS) goals, offsetting 100 percent of the facility's annual electricity consumption and supporting the generation of renewable energy at wind farms in Minnesota, Nebraska, Oklahoma, and Wyoming.

EPA **program offices contributed** to sustainability during the design and building process. EPA occupants with expertise in a variety of areas provided technical support to represent their programs as the Potomac Yard facility was developed. EPA program staff provided requirements and review for integrated pest management, green cleaning, sustainable furniture selection, recycled content in construction materials, and waste recycling programs during construction and after occupancy. A user education program, which includes signage, has been developed to inform occupants and visitors about the sustainable features and operations of the facility.

Lighting is responsible for nearly 30 percent of the energy consumption of a typical office building. Potomac Yard uses ENERGY STAR **efficient lighting strategies** to reduce energy use, such as: double-glazed windows from floor to ceiling on the perimeter; glass panel insets in the systems furniture, and glass doors and sidelights for conference rooms and offices that extend natural daylighting farther into the core of the building. The facility also features dimming ballasts on perimeter overhead lighting with daylight sensor controls to reduce the need for artificial light when daylight can compensate for foot candle (fc) levels, and occupancy sensors with manual override switches in enclosed offices and shared support spaces. General office overhead lights supply an average of 30 fc ambient light using energy efficient T-8 lamps and a translucent lens that splays a wide angle of light across the office area. Individually controlled T-2 task lights supplement the overhead lighting to provide the required 50 fc at the desktop. This strategy provides for individual preferences and reduces general lighting levels for an opportunity to reduce overall energy use.



Heat islands generated from sun on roofs typically raise interior temperatures 2 to 10 degrees Fahrenheit hotter in urban/suburban densities than rural areas, resulting in higher energy use to keep up with the cooling requirements. The facility's highly reflective, white, flat, and sloped **ENERGY STAR-compliant roof materials** are designed to reduce the amount of solar heat absorbed, decreasing the cooling demand and energy use.



During construction, wood and metal waste was recycled into bins daily, diverting construction waste from landfills. EPA tenants will have **recycling** bins on each floor to collect bottles, cans, paper, cardboard, batteries, CD/DVD/diskettes, and toner/inkjet cartridges. A recycling room next to the loading dock in each building will store recyclables until they can be hauled to offsite recycling facilities.

Sand filters located below the grade in the rear of the facility will **treat stormwater** runoff from each building to the Potomac River and are expected to reduce total suspended solids by more than 80 percent and total phosphorous by 40 percent.



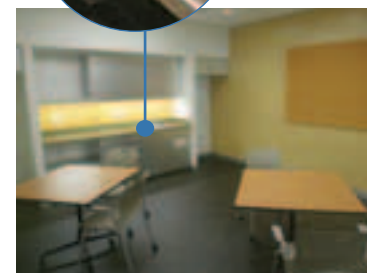
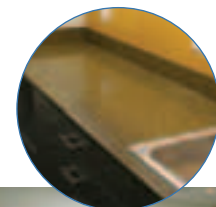
Mechanical system performance was specified to be 20 percent better than ASHRAE 90.1 1999. The facility has automated systems control with monitoring capabilities and is fully commissioned and reviewed by a commissioning agent.

Low-VOC adhesives, paints, sealant, and caulks were used throughout tenant and public areas to ensure superior **indoor air quality (IAQ)** for the facility's occupants. In addition, the facility's operations and maintenance staff will follow established sustainable best management practices plans for cleaning, pest management, and landscaping to ensure IAQ standards set during construction are retained.



The **sustainable workstation furniture** procured for Potomac Yard contains 35 to 40 percent recycled material content. Office furniture containing recovered materials is a designated product under the federal government Comprehensive Procurement Guidelines (CPG) program. The furniture is also GREENGUARD certified for indoor air quality material emissions. Other sustainable features include ergonomic chairs, energy-efficient task lamps, and corn-based fabric on workstation exterior panels.

To promote **water efficiency** the exterior landscape has no permanent irrigation and uses drought-resistant and local plants such as the American Holly.



EPA installed two pantries on every floor using **sustainable materials** and finishes such as recycled aluminum in counter tops, metal laminate cabinetry, linoleum flooring, and rubber bases. The pantries are stacked from floor to floor so they can easily direct exhaust to the outside, maintaining IAQ. ENERGY STAR refrigerators and microwaves are located in the central pantries for **energy efficiency**.

During construction, an **IAQ plan** was established to protect the facility's finish materials stored on site such as drywall, ceiling tiles, and heating, ventilation, and air conditioning (HVAC) system open ductwork. To prevent contamination from odors, dust, or liquids, plastic sheet covers and raised pallets were used until the materials were installed and the mechanical system was fully enclosed.



Green roofs help reduce sun heat loads transferred to occupied space below. An accessible patio and 1,711-square foot green roof planted with sedum in 4-inch depth trays are located on the fourth level connection between the two towers. **Recycled content** plastic lumber benches are provided for tenant use.



Low-flow faucets with electronic shutoff, men's room low-flow urinals, and women's room dual-flush toilets contribute to the facility's overall **water conservation**.



EPA required in its lease procurement that the building be located in close proximity to the local Metrorail trains, Metro buses, and the Agency shuttle bus routes and provide shower facilities and onsite bicycle parking for 53 bikes to encourage **environmentally responsible commuting**.