



# VERIDIAN HOMES

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## Veridian Homes LLC-Green Tier Application

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### Section V-Environmental Performance

#### ATTACHMENT 3

##### **Tier 1 Scope of "Covered Facilities"**

Veridian baseline performance will be set utilizing calendar 2004 performance and practice data. The facility covered is located at 6801 South Towne Drive; however the practices will extend to each active construction site. The control scope of the EMS includes land development, building/construction practices of Veridian, and the building/construction services provided to Veridian under specific contracts.

The EMS will be limited to the business activities of Veridian. Trade contractor services will conform to the Veridian EMS through contracts issued specifically for Veridian job sites. Veridian will use training and auditing to support the trade contractor execution of the Veridian EMS.

The scope of this application does not include any requirement by trade contractors to establish Green Tier qualifying (ISO 14001 or equivalent) EMS programs within their own organization.

##### **Baseline Assessment**

The baseline includes business aspects and functions related to air, water and waste impacts resulting from the construction of single and multi family homes. The baseline activities include land development, excavation, foundation, backfill, framing, finishing, flatwork, and landscaping including any activities associated with the listed construction activities. The baseline also includes current processes in place to schedule the work, deliveries and trade contractor activities. It also includes elements of current site review, auditing and contractual conditions that apply to trade contractors. Veridian does have several elements of an EMS that are being incorporated and modified to meet the requirements of Green Tier level I.



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### Significant Impacts Identified to Date:

#### 1. Trade and Veridian impacts during construction

Veridian previously identified key points within the building process where accountability and process review (auditing) will prevent ongoing erosion, waste and run-off problems. By making each visiting trade contractor responsible for actions that prevent potential impacts through up-front specifications and contracts, Veridian will prevent site problems overall. Veridian is targeting problems at sites where one trade contractor may affect the next contractor on site in a negative manner.

A first step made by Veridian is to implement "Trade Contractor Sign-Off Sheets." The sheets identify specific trade responsibilities pertaining to materials management, site access, erosion and waste that each contractor must complete before their work will be authorized and paid. The sign-off system includes non-conformance (root cause prevention) and corrective action. Veridian site construction managers and/or community builders provide final sign-off as a verification of completed corrections.

#### Contractor sign-off sheets:

Attached are sign-off sheets that signify several of the steps in the Veridian home building process. Veridian is currently amending those sheets to include additional control, minimization or elimination steps that will require the contractor or construction manager to certify that required measures regarding waste management/minimization, storm water management, erosion control, and air pollution have been successfully avoided or controlled. Each sheet identifies specific activities that are required for conformance to the EMS to be determined as a "work completed."

If a non-conformance is identified and corrective action is required, it must be completed prior to the work being authorized for payment.

#### Objective 2005

- ✓ Verify through observation and auditing that the checklists or sign-off sheets adequately capture non-conformances and construction aspects that lead to the identified significant impact.
- ✓ Target the management review of audit findings at even-flow production meetings.
- ✓ Review all trade contracts annually to assure responsibilities are clearly identified.
- ✓ Target the review of all trade engineering, performance and delivery specifications at least annually to assure correct instructions are provided to each trade.

The objective is to compile a list of sign-off non-conformances identifying, at a minimum, the trade contractor responsible, the non-conformance by description, or weight, or severity, or some weighted scale, and any actual environmental impact that occurred. Information such as the correction activity and length of time to correct may be tracked. The objective is to utilize this information to identify continuous systematic improvements by classifying



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trade service providers, identifying needs for trade contractor training, and to eliminate trade providers who do not comply.

### 2. Recycling, Waste Management and Energy Efficiency

Veridian has identified construction waste management as a significant environmental impact prior to this application. To identify and quantify the impact, Veridian procured the assistance of WasteCap Wisconsin.

WasteCap initially provided services that identified the various types of waste being generated during the building process and located potential recycling options for Veridian. After identifying major waste stream components, Veridian began requiring separation and recycling of cardboard and wood generated at its building sites.

The baseline information shows the following:

Material	One Year* Ton	Per house Tons	One year* Vol. (yd3)	Per house Vol. (yd3)
Trash		<b>1.33</b>	<b>17,064.0</b>	<b>26.66</b>
Cardboard	<b>211.6</b>	<b>0.33</b>	<b>8,464.0</b>	<b>13.23</b>
Wood	<b>738.8</b>		<b>4,493.62</b>	<b>7.72</b>
			<b>13,407.62</b>	<b>20.95</b>
	<b>52.69%</b>	<b>52.69</b>	<b>44.00%</b>	<b>44.00%</b>

\*period Nov. 03-Oct. 04 based on 640 homes constructed-WasteCap 3-22-05.

The baseline shows that Veridian achieved a total recycling rate of approximately 50 percent on a weight basis for the 12 months beginning November 2003 by weight (44 percent by volume) thus diverting over 2000 tons of wood from Wisconsin landfills in 2004 and beneficially using the wood as landscape mulch. This was accomplished through segregation of wood and cardboard out of general trash to reuse or recycle.

Veridian built over 640 homes in 2004, which saved enough energy to light over 70 homes. (For every 400 new homes built to Wisconsin Energy Star and Green Built certification translates into ten-year greenhouse gas savings that include 41,409 therms \$30,642 1 homeowner savings at .74/therm; over 484,817 pounds of carbon dioxide not released into the atmosphere; and over 414 pounds of nitrous oxide not released into the air.

In 2004, Veridian participated with the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy Building America Program. A Building America home was designed and constructed by Veridian and succeeded in reaching the minimum program goal of 40% energy-efficiency by actually being 43% more energy-efficient. The goals of the project included a significant reduction in the amount of lumber used in construction, along



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with increased efficiencies in the delivery of heating and cooling. The home also featured a solar water heating system, rain garden, and new energy-efficient products such as insulation and windows. In recognition of this home's extreme energy-efficiency, The National Association of Home Builders awarded Veridian Homes with the Green Project of the Year Award.

Veridian Homes has been recognized nationally for its efforts to build green. In 2004 and 2005, the U.S. Environmental Protection Agency named Veridian Homes as an Energy Star Partner of the Year for its outstanding contribution to reducing greenhouse gas emissions by building energy-efficient homes. And, in 2004, in recognition of its innovative environmental stewardship efforts, Veridian received the Wisconsin Business Friend of the Environment award from the Wisconsin Environmental Working Group.

### Objective 2005

During 2005, Veridian will continue to identify the components of the general waste stream in order to determine fluctuations in the consistency of the waste stream and significant components that represent an opportunity for reuse or recycling.

From 2005 through 2007, Veridian will perform a systematic review of purchasing methods in order to search for opportunities to minimize incoming waste associated with material packaging, shipping, handling, spoilage, or obsolescence.

- √ During 2005, Veridian will begin reporting results from the recently implemented reuse and recycling programs for drywall scraps.
- √ During 2005, Veridian will investigate the feasibility of reusing or recycling vinyl siding scraps.
- √ Within the 2005 and 2006 construction seasons, Veridian will implement a concrete spoils recycling program to capture excess and wash-out concrete spoils for concrete aggregate.
- √ During 2005, Veridian will begin to identify opportunities for insulation scraps, banding, roofing shingle scraps, and ceramic/brick and block recycling.
- √ During 2005 through 2007 construction seasons, Veridian will identify opportunities to convert wood debris into suitable mulch, cover or erosion control materials.

The target for 2005 is to improve the overall reuse and recycling rate by 10 percent. This means that the 50 percent achievements (approximate) in base year 2004 will be increased on average to 60 percent in 2005 compared to base year 2004.



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### Objectives 2006 and Beyond

- √ Additional objectives for 2006 and 2007 will be to decrease overall trash generation pre square foot of home built, decrease the incidence of sidewalk and curb damage, and identify opportunities to support Sustainable Development (SD) suppliers and promote small business opportunities related to recycling and reuse. Targets for these items will be determined after the feasibility studies have been completed.

### 3. Energy Consumption

Energy consumption during construction primarily consists of the direct energy used to build the home and the consumption of raw materials that have taken energy both for manufacturing and for transportation to the work site.

The methods and materials Veridian uses to construct the home determine the energy use capability of the home for decades. The capability is defined as the physical construction of the home using energy rated materials, fixtures, appliances and assembly methods.

Veridian used a variety of energy efficient materials and construction methods during base year 2004.

During 2004, a third party Wisconsin Energy Star audit was performed to determine the capability of current construction and methods Veridian utilizes. The results of that audit are attached and form the 2004 baseline value.

Veridian has determined that the homes it builds will continuously improve in energy efficiency while remaining sound economically and providing a healthy environment for the occupant.

Veridian will be using a number of techniques to target improvement of the energy rating in 2005 to 0.05 cfm/sq. ft or less.

Veridian will implement energy efficient construction techniques and utilize technologically sound energy efficient devices to achieve this goal. The improvements may include but are not limited to lighting, heating, water and heating, geothermal techniques, composite materials, solar power components, and passive heating/lighting techniques.

Veridian will also begin to publish instructional materials that will direct and assist the home owner in utilizing the energy efficient capacity of the home by the way they live in the home and within the community.



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Veridian will publish at least one document in its outreach program during 2005 that will identify the relevance of the efforts Veridian accomplishes during home building pertinent to environmental performance improvement. This document will be targeted toward the prospective homeowner.

Veridian's objective for 2006-2007 will be to create new documents or modify existing ones that the home owner can use to understand the energy efficient construction of their home by knowing the particular materials, appliances, and techniques that constitute their new living environment.

In 2006-2007, Veridian will explore methods that can be used to measure and capture value for energy savings homeowners can affect by their purchase, procurement, transportation, and building technique modifications.

#### 4 Charter Formation

In 2004, Veridian participated in discussions regarding the formation of a Charter Agreement under Wisconsin Act 276. This Charter group currently consists of Wisconsin Department of Natural Resources (WDNR) representatives, Dane County representatives, other local government representatives (see the attached draft charter) and Veridian Homes, LLC.

The objective of Veridian's participation in the Charter Agreement process was to bring Veridian and several layers of governmental entities together to determine if voluntary means can achieve greater storm water and erosion impact prevention than the use of regulatory means alone. The Charter Agreement is also intended to limit layering and conflicting regulation and provide the opportunity to streamline approval of site specific or general controls that achieve greater prevention than prescriptive measures.

- √ Target number one for 2005 is to finalize the Charter Agreement language and to begin implementation of the methods that will achieve greater sediment release prevention from building sites.

Target number two is to implement an internal site review and site auditing system. The intent of that system is to provide a timely look at the site for regulators (posted or supplied data) while implementing a true day-to-day site management program. The Veridian internal reviews will focus on identifying and correcting non-conforming activities in all aspects of the home building process that can lead to soil erosion or run-off.



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- √ Target number three relates to establishment of an early consultation process with the developer by the WDNR and other affected governmental agencies. This step is being added to the normal review process in order to provide early identification, through coordinated review, of fragile areas at a potential development. Early identification and discussion of fragile areas will provide a smoother process with and enhanced environmental protection.
- √ Target number four for 2005 is the creation of an annual report that will outline the accomplishments of the previous year. Calendar 2005 will set the base year, therefore targets will be set initially in 2006.
- √ Target number five for 2005 is the collaboration between Veridian and affected governmental agencies to develop and implement innovative erosion management practices on several demonstration developments.