

PART II – SUMMARY OF ACHIEVEMENTS

Instructions to School Principal

Provide a concise and coherent “snapshot” that describes how your school is representative of your jurisdiction’s highest achieving green school efforts in approximately 800 words. Summarize your strengths and accomplishments. Focus on what makes your school worthy of the title U.S. Department of Education Green Ribbon School.

PART III – DOCUMENTATION OF STATE EVALUATION OF NOMINEE

Instruction to Nominating Authority

The nominating Authority must document schools’ high achievement in each of the three ED-GRS Pillars and nine Elements. For each school nominated, please attach documentation in each Pillar and Element. This may be the Authority’s application based on the Framework and sample application or a committee’s written evaluation of a school in each Pillar and Element.

Nominating Authority’s Certifications

The signature by the Nominating Authority on this page certifies that each of the statements below concerning the school’s eligibility and compliance with the following requirements is true and correct to the best of the Authority’s knowledge.

1. The school has some configuration that includes one or more of grades Pre-K-12. (Schools on the same campus with one principal, even a Pre-K-12 school, must apply as an entire school.)
2. The school is one of those overseen by the Nominating Authority which is highest achieving in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental and sustainability education.
3. The school meets all applicable federal civil rights and federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

Name of Nominating

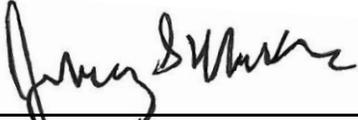
Agency Ohio Department of Education

Name of Nominating

Authority Mr. Jeremy Marks



I have reviewed the information in this application and certify to the best of my knowledge that the school meets the provisions above.

A handwritten signature in black ink, appearing to read "James S. Walker".

(Nominating Authority's Signature)

Date 1/22/2014

The nomination package, including the signed certifications and documentation of evaluation in the three Pillars should be converted to a PDF file and emailed to green.ribbon.schools@ed.gov according to the instructions in the Nominee Submission Procedure.

OMB Control Number: 1860-0509
Expiration Date: February 28, 2015

Public Burden Statement

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this information collection is 1860-0509. Public reporting burden for this collection of information is estimated to average 37 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The obligation to respond to this collection is required to obtain or retain benefit P.L. 107-110 Sec. 501, Innovative Programs and Parental Choice Provisions. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the U.S. Department of Education, 400 Maryland Ave., SW, Washington, DC 20202-4536 or email ICDocketMgr@ed.gov and reference the OMB Control Number 1860-0509. Note: Please do not return the completed ED-Green Ribbon Schools application to this address

Milton-Union Exempted Village School

In 2012, the Milton-Union School District replaced old and energy-inefficient buildings with a newly combined PK-12 building. The new building incorporates state-of-the-art environmental system controls and features enhancements to the building envelope for energy efficiency. The new school was awarded **LEED Gold certification by the U.S. Green Building Council in 2013**

What separates Milton-Union from other schools is the degree to which energy is managed and our commitment to an environmentally enlightening curriculum. We use an advanced control system to integrate all of our energy efficient systems and strategies and make them work together. It allows fine tuning of the HVAC system and building lighting. Numerous meters and sensors provide temperature and energy-use data that is analyzed and used to refine settings.

As we use the building and identify occupancy patterns, we change how the building systems operate to match these patterns and respond to our needs. Our efforts have resulted in significant energy savings over buildings of similar size and type. As of January 15, 2014, the measured energy use was \$0.84 per square foot per year. This is a 40 Percent improvement over typical energy use and puts Milton-Union in the top echelon of energy-efficient buildings.

Examples of the energy-efficient and sustainable strategies incorporated into the building include:

- **Daylight harvesting in classrooms:** Classrooms have 8X8-foot windows to bring in the maximum amount of natural light. Windows with a southern exposure are equipped with solar shades to reduce heat gain and to increase the amount of light that enters
- **Improved thermal envelope using spray polyurethane foam in exterior walls and attic spaces:** this enhances the insulation value of the wall assembly and creates a monolithic air barrier that greatly improves energy efficiency
- **High-efficiency air-cooled chillers with ice storage:** Chillers produce ice at night when electricity rates are lower. Ice is used to cool the building during the day. Due to enhancements to the building envelope, the ice alone is sufficient to cool the building on many days
- **Renewable energy systems:** A 32 kW photovoltaic array and a 15 kW wind turbine produce approximately 5 percent of the total electricity needs during the weekdays. *This jumps to 30 percent on weekends*
- **Solar thermal system:** A 435,000 BTU-per-day solar thermal system is used to preheat water offsetting gas use for the building
- **Rainwater harvesting:** A 75,000-gallon rainwater harvesting system, one of the largest in Ohio, provides water for flushing all urinals and toilets as well as irrigating. *This initiative alone results in an annual savings of over \$10,000, approximately 35 percent of the previous cost*
- **Energy dashboard:** Monitors in all school lobbies show real-time energy use and how Milton-Union performs when compared to a base-line case

In addition to saving energy, preserving the environment, and improving health and safety, we use the building and our 130-acre site as a learning tool to promote sustainability with students, staff and community. With wooded areas, open prairies, rain gardens, sports fields and playgrounds, our site resources and building are incorporated into the curriculum at all grade levels. Examples include:

- *Recycling and waste reduction programs divert an average of 21.1 percent of the district's total waste to recycling and repurposing centers.*
- A required Earth Science curriculum that includes studying:
 - The solar thermal system that pre-heats water which offsets the use of natural gas
 - The impact that a "green" roof makes by absorbing rainwater while filtering dirt/minerals through its roots
 - Effects of window solar shades related to daylighting and reducing cooling loads

- Energy produced by the on-site wind turbine and photovoltaic solar array
- The rainwater collection system and the importance of water conservation
- Rain gardens and bioswales and the importance of protecting water shed areas
- The energy saved by maximizing natural lighting and using photometric sensors to turn off lights in unoccupied areas
- Other programs include:
 - An elementary rainforest unit and high school biodiversity unit
 - STEM curriculum including the Envirothon competition
 - Student participation in the Miami County Science Fair and American Government Week
 - Partnerships and special programs with the Master Gardeners, Park District and Miami Soil and Water Conservation District..

As our teachers began to incorporate into their teaching units the importance of green initiatives and district personnel worked with energy consultants to fine-tune control systems, our building was drawing attention from across the state questioning our seemingly “unrealistic” operating cost of \$0.84 per sq. ft. Over 100 tours have been given to environmentalists, architects, builders, and school leaders from other districts. After one of our tours for the executives from PBS/Think TV, they expressed interest in producing a documentary for all Ohio schools featuring our building design and the resulting energy savings. Milton-Union has also been included in the featured article, “Business of Energy Management,” in the national publication of District Administration, January '14 issue.

Milton-Union is certainly worthy of the title U.S. Department of Education Green Ribbon School.

Green Ribbon School Application

Part One:

School: Milton-Union PK-12_____

District: Milton-Union E.V.S._____

Contact person(s): Dr. Virginia Rammel, Superintendent_____

Email: rammelv@milton-union.k12.oh.us _____ Phone: (937) 884-7910

Part Two: Summary narrative

Provide an 800-word maximum narrative describing your school's efforts to reduce environmental impact and operating costs; improve students' and staff members' health; and provide effective environmental and sustainability education. Focus on unique and innovative practices and partnerships. Use the bullets below as a guide to frame your narrative and include relevant information that the reviewers are looking for during their evaluation of your application.

- Is your school participating in a local, state or national school program, such as the U.S. Environmental Protection Agency's ENERGY STAR Portfolio Manager, EcoSchools, Project Learning Tree or others that ask you to benchmark progress in some fashion in any or all of the Pillars?
- Has your school, staff or student body received any awards for facilities, health or environment?

Insert narrative here:

The Milton-Union PK-12 school was recognized by the U.S. Department of Education's National Center for Educational Statistics and the New American Foundation's Federal Education Budget as earning the top rating in the state for highest achievement and lowest costs. Throughout the evaluation, Milton-Union was in the top third of all Ohio schools for achievement and in the bottom third for spending. The Milton-Union Elementary School has been recognized as a National School of Excellence while both the elementary and Milton-Union Middle School have attained School of Promise status. The School of Promise recognizes schools attaining solid student achievement in reading and mathematics while serving a significant number of economically disadvantaged students.

To ensure all students are ready to learn when they enter first grade, Milton-Union offers all day, every day kindergarten, an on-site preschool supported by the Miami County Educational Service Center and two sections of Head Start for children ages 3-5 funded through the Council on Rural Services. Students in grades 3-8 truly learn at their level: students are assigned to quintiles based on teacher input and the results on formative and summative assessments both standardized and teacher-created. The five quintiles range from groups of students receiving enrichment to those groups on-level to groups needing intervention. Each quarter, a benchmark test is administered, the results analyzed and, if necessary, students are switched to a more appropriate quintile. Curriculum offerings in our 500-student high school include robotics, forensics, STEM, statistics, Rosetta Stone, advanced biology, Advanced Placement math class and six dual-enrollment opportunities. One hundred-fifteen 2013 graduates earned more than \$1.3 million in scholarship money.

While we continue to maintain high educational achievement ratings, our commitment to energy efficiency and environmental sustainability plays an integral role in keeping costs low. In 2012, Milton-Union replaced old and energy-inefficient buildings with a new combined PK-12 building. The new building incorporates state-of-the-art environmental system controls and features enhancements to the

building envelope for energy efficiency. The new school was awarded LEED Gold certification by the United States Green Building Council in 2013.

Energy efficiency and sustainability were at the heart of the building efforts. As a result, energy costs are 36 percent below those expected for a building of similar size. As October 2013, measured energy costs were \$0.90 per square foot, compared to an average of \$1.40 per square foot. Another green initiative that is resulting in approximately 35% savings in water cost is through the rainwater harvesting system. From the beginning of the project, the goal was for the building to not only be energy efficient, but also a learning tool for sustainability for our students, staff and community.

The building site is an important resource to the community with an abundance of natural green spaces that provide an array of teaching opportunities. The site is 130 acres and was donated to the district in 1973. Of the total area, 44.2 acres are wooded, 8 acres are a former tree farm, 11.7 acres are former fields that have been converted to open prairie, and 2.8 acres are a new detention area and bioswale. In addition, 3.7 acres are dedicated to a park with picnic shelters and open space. The building itself occupies 14 acres. This includes approximately 6.2 acres of paved areas and 3.6 acres of playground, landscaped areas and rain gardens. The remaining 45.4 acres of the site are sports fields. New plantings of water-efficient, native species were included as part of the construction project.

From improved air quality to contaminant controls, the benefits of the PK-12 building design help to improve students' and staff members' health and safety. Key features, such as rain gardens and a wind turbine, offer unique ecological education opportunities. In fact, the number of renewable energy systems installed at the school provides students direct exposure to a variety of sustainable strategies ranging from solar thermal, photovoltaic solar panels, rainwater harvesting and real-time monitoring of energy use.

Part Three: PILLAR ONE: Net zero environmental impact

Provide a 1,500-word maximum narrative of how your school is progressing toward elimination of GHG emissions and waste as well as water and energy conservation. Below are guiding questions to help frame your narrative. (Element 1A: Zero greenhouse gas (GHG) emissions)

Energy

- If you have received the U.S. Environmental Protection Agency's ENERGY STAR certification, in what year was the certification earned?
- How has the school reduced its total non-transportation energy use (i.e., electricity, lighting and temperature control) from an initial baseline?
- Are there any energy saving programs in place (such as "Turn the Lights Off" or other student-led programs)?
- What percentage of your energy consumption comes from on-site renewable energy generation or purchased renewable energy?

Buildings

- Have you constructed and/or renovated any buildings in the past three years?
- What percentage of the building area meets Leadership in Energy and Environmental Design (LEED), Collaborative for High Performing Schools, Green Globes or other environmental rating standards? Have you reduced or offset the GHG emissions from building energy used?
- Have you fully implemented the Facility Energy Assessment Matrix within the U.S. Environmental Protection Agency's Guidelines for Energy Management? Do you use the Federal Guiding Principles Checklist in Portfolio Manager to assess the school building?
- Are your furniture purchases certified under the Business and Institutional Furniture Manufacturers Association's "level" eco-label?

- Is a purchasing and procurement policy for energy- and water-efficient products in place?
- Are there occupancy sensors or daylight harvesting controls in the building?
- Describe other indicators of your progress towards elimination of GHG.

Insert Narrative Here:

The Milton-Union School District is fully committed to environmental sustainability, integrating it into all aspects of operation. The School Board has passed numerous resolutions making sustainability the norm. Regarding energy conservation, board policy states, *“Declining levels of natural energy resources and the economic reality of increased costs for utility services dictate that energy conservation programs be supported by all school personnel.”*

In 2012, Milton-Union completed the construction of a new 217,000-square-foot combined PK-12 school building. This replaced two older buildings, one built in 1938 and the other built in three phases in the 1960s. The old buildings were energy inefficient and lacking in adequate technology for today’s teaching methods. They also lacked air conditioning and proper environmental controls in order to maintain adequate thermal comfort. In 2008, the district engaged in a successful building levy campaign with the central idea of creating an environmentally friendly and energy efficient new school. The building includes numerous energy conservation features such as:

- **Daylight harvesting in classrooms**
Each classroom has large exterior windows (eight feet by eight feet) to bring in the maximum amount of natural light. The windows on the south side of the building have exterior solar control devices positioned to shade two-thirds of the exterior glass. This serves two purposes. The first is to reduce heat gain by shading the lower portion of the window thereby reducing the cooling load on the building. The second is to bounce light into the classroom and onto the ceiling to maximize illumination levels. The ceilings in all classrooms are highly reflective and sloped to help bounce the light as far as possible into the classroom. The idea is to provide enough light in each classroom so as to reduce the need for artificial lighting. The lights in the classrooms are on occupancy sensors. When the rooms have been vacant for 15 minutes, the lights automatically turn off.
- **Improved thermal envelope using spray polyurethane foam in exterior walls and the attic**
Traditional methods of insulating exterior walls use rigid board insulation with an R-value of approximately 5 per inch. The thermal performance of the wall is highly dependent on the skill of the contractor and quality of the installation. Any gap between the insulation boards is a failure in the thermal envelope that will negatively impact energy efficiency. The exterior walls at Milton-Union are insulated with sprayed polyurethane foam insulation (SPF). This provides a monolithic installation without gaps. This insulation is also continuous in the attic space to provide a complete building envelope. The R-value of this product is 7.5 per inch, a 50 percent improvement over traditional rigid insulation. The foam insulation also acts as an air and vapor barrier. Air infiltration is the biggest contributor to energy loss in buildings. The SPF virtually eliminates air infiltration creating a highly efficient exterior wall assembly.
- **Highly efficient thermally broken windows and doors**
All exterior doors, curtainwalls and windows have a thermal break that eliminates thermal transfer.
- **High-efficiency air-cooled chillers in conjunction with ice storage**
Many HVAC systems were studied in the design phase of the new building including geothermal systems. The engineering team determined that using high-efficiency air-cooled chillers and changing the way they were controlled would save a significant amount of energy at a much lower cost than a more efficient geothermal system. The chillers are programmed to operate up to 60 percent of their maximum capacity which is the level at which they are most energy efficient. In addition to the control adjustments, the chillers are used to create ice at night when electricity rates are lower. The ice is used during the day to cool the building. There are many

days when all that is required to cool the building is the ice produced at night. The chillers never come on during the day which saves a tremendous amount of energy and reduces operating costs.

- **Renewable energy systems**

The building includes:

- A 15 kW wind turbine
- A 32 kW photovoltaic array and
- A 435,000 BTU per day solar thermal system

On an average day the wind turbine and photovoltaic array produce 5 percent of the total electricity demand. This jumps to 30 percent on unoccupied weekends. The solar thermal system pre-heats water from the municipal supply to offset the use of natural gas.

- **Rainwater harvesting**

A 75,000-gallon rainwater harvesting system, one of the largest in Ohio, provides water for flushing all urinals and toilets in the building as well as irrigation for the site. This initiative alone, results in an annual savings to the district of over \$10,000, approximately 35% of the previous cost of water.

- **Advanced energy monitoring and controls**

Milton-Union uses the Building Logix System to track energy use and to control the HVAC systems. This allows staff members to manage energy use in specific areas of the building. The system not only controls HVAC equipment but also controls lighting, both interior and exterior. Sensors have been incorporated into several areas of the building that turn off lights when natural light is sufficient.

- **Energy dashboard**

The Building Logix System includes an energy dashboard that indicates how much energy is being used in the building at any given time. In each lobby of the school, a television monitor displays the dashboard so staff, students and visitors can see how the building is performing in real time. The elementary, middle and high school have separately metered zones. Each school can see their energy performance and compare it to the others. This has created competition among the students to see which school can use the least energy. Also displayed are explanations of the building systems, such as the photovoltaic array, solar thermal, wind turbine and rainwater harvesting systems. Fun facts are displayed as well, such as how many tablet computers could be charged with the energy produced by the solar array and wind turbine or the equivalent number of cars taken off the road due to the reduction in carbon emissions.

Energy use for the new building is well below that expected for a building of similar size. The current standard energy cost is \$1.40 per square foot per year. As of October 2013, the measured energy consumption was \$0.90 per square foot, a 36 percent improvement. In the old buildings, which had standard light fixtures and no air conditioning, the electric/gas bill was approximately \$258,000 per year. The bill for the first year of operation in the new facilities with air conditioning and efficient lighting as well as many other energy saving features was approximately \$249,000. This savings corresponds similarly to findings in another study. Since occupying the new building, we have implemented additional energy efficiencies. As a result, electrical costs from July through October of '12 when compared to the same four months of '13 revealed a 36 percent reduction in costs. We anticipate future energy bills to be even lower in the coming year as we continue to identify energy-saving opportunities with the help of our energy management team.

Regarding acquisition of new furniture, the district purchases products that are Greenguard certified whenever possible. All new computers or electronic devices are required to meet Energy Star standards.

Part Four: Element 1B: Improved water quality, efficiency and conservation.

Provide a 500-word maximum narrative of how your school is progressing toward water conservation. Below are guiding questions to help frame your narrative.

- Do your facilities have low flow fixtures (such as faucets, toilets, sinks)?
- Can the school demonstrate a reduction in total water consumption intensity (measured in gal/square foot) from an initial baseline?
- Do you conduct audits of facilities and irrigation systems to make sure they are free of significant water leaks and to identify opportunities for savings?
- Do all outdoor landscapes consist of water-efficient or regionally-appropriate (native species and/or adapted species) plant choices?
- Are alternative water sources (e.g., greywater, which means using water from sinks or kitchens, for example) used before drinkable water for irrigation?
- If you use drinking water from the school's own well, are your drinking water sources protected?
- Do you have a program in place to control lead in drinking water (including voluntary testing and implementation of measures to reduce lead exposure in drinking water)?
- Are all taps, faucets and fountains used for drinking and cooking cleaned on a regular basis to reduce possible bacterial and other contamination? Are faucet screens and aerators regularly cleaned to remove particulate lead deposits?
- Is an area of the school grounds devoted to ecologically or socially beneficial uses, including those that give consideration to native wildlife (such as Bioswales or Rain Gardens, etc.)?
- Describe other ways you are working to improve water quality, efficiency and conservation.

Insert Narrative Here:

Water conservation and quality is a central theme for staff and students. Low-flow urinals and water closets have been installed in all restrooms and a 75,000-gallon rainwater harvesting system was incorporated into the design. The collected rainwater is used to flush all toilets and urinals throughout the school. All faucets have been equipped with aerators and science classrooms have half-gallon-per-minute nozzles. The baseline water consumption of urinals and toilets for the building is 1,859,812 gallons per year. Based on modeled projections, the district will see a 100 percent reduction due to the high efficiency fixtures and the rainwater harvesting system.

The rainwater harvesting system is part of an interactive storm water management system that includes bioswales and rain gardens. Water from the roof of the school is directed to rain gardens with native plants that remove solids and contaminants. The water is directed to a 24"-diameter storm pipe that leads to the 75,000-gallon underground storage tank. The water is then pumped into a 1500-gallon holding tank inside the building where it is chlorinated and then pumped to the plumbing fixtures. The rain gardens are a prominent feature of the new building and have been arranged as outdoor classrooms. In 2013, the project received the Merit Award from the Ohio Chapter of the American Society of Landscape Architects.

Excess storm water runoff is directed to a detention basin and an 1800-foot long bioswale. Students study the effect the bioswales have on water quality and biodiversity. They have been incorporated into the natural science, art, math and English curriculums.

To help prevent lead contamination in the drinking water, the School Board has instituted a flushing protocol. If lead would be detected in the municipality's routine testing of the water, the district would flush the pipes and/or storage wells. Thus far, no contamination has been noted.

All plumbing fixtures including taps and water fountains are cleaned and sanitized on a daily basis.

Part Five: 1C: Reduced waste production.

Provide a 500-word maximum narrative of how your school is working toward elimination of all solid or hazardous waste through, reduced consumption, reuse practices and recycling. Below are guiding questions to help frame your narrative.

Waste

- What percentage of waste is diverted from the landfill or incinerator by reuse, composting and/or recycling?
- Are you using post-consumer materials or materials managed by the Forest Stewardship Council, Sustainable Forestry Initiative, American Tree Farm System or other certification standard when possible?
- Are procurement policies in place to encourage the purchase of recycled content materials, supplies or furniture?
- Are other waste reduction programs in place?

Hazardous waste

- How much hazardous waste do you generate per year? How is it disposed?
- Is there a Hazardous Waste Policy in place and actively enforced for storage, management and disposal of chemicals, and hazardous waste in laboratories and other areas?
- What percentage of total computer purchases are Electronic Product Environmental Assessment Tool (EPEAT) certified products? How do you dispose of unwanted computer and other electronic products?
- Do you use certified "green" cleaning products that meet the environmental standards of established eco-label programs?
- Does your custodial program use the principles of effective management and "green" service?
- Is your custodial program certified by the ISSA Cleaning Industry Management Standard - Green Building (or an equivalent standard)?
- What other indicators show that you are reducing waste and eliminating hazardous waste?

Insert Narrative Here:

Recycling and waste reduction are a way of life for Milton-Union and is a School Board policy. The students lead the effort and are responsible for collection and proper handling of recyclable items. Each classroom has recycling bins that are emptied each day and taken to a dedicated recycling container that is picked up by a waste management company on a weekly basis. The district diverts an average of 21.1 percent of its total waste to recycling and repurposing centers. We donate our used technology to Goodwill for ReConnect, a partnership between Dell and Goodwill Industries International that enables consumers to responsibly recycle any brand of unwanted computers or computer accessories at no cost.

In 2012, the district directed the food service department to change from Styrofoam trays to washable, reusable trays to reduce solid waste. The district also shifted how food is prepared and served. Instead of a traditional serving line, students and staff enter a food court where they have more options. Students are able to purchase just the food they want to eat which has significantly reduced food waste and increased revenue.

The building design team was instructed to reduce construction waste and to provide as many products with recycled content as possible. Building materials such as steel, concrete block, composite wood and flooring have high levels of recycled content. Overall, the amount of recycled content within the building is approximately 27 percent of the total cost of materials installed (\$10,836,965). During construction, approximately 76 percent of all construction waste was diverted to recycling or repurposing centers.

The district's maintenance policy dictates that all chemicals and potentially hazardous substances be clearly labeled and properly stored. MSDS sheets and instructions for cleaning potential spills are readily available to all staff members. All storage room doors have been equipped with closers and are

negatively pressurized to eliminate potentially harmful vapors from entering occupied areas. In addition, thermometers and sphygmomanometers used at the school do not contain any mercury.

Part Six: Element 1D: Use of alternative transportation to, during and from school.

Provide a 500-word maximum narrative of how your school is working toward alternative transportation or upgrading current modes of transportation. Below are guiding questions to help frame your narrative.

- What percentage of students walk, bike, bus or carpool (two or more students in the car) to/from school?
- Do you have a no-idling policy on file and signs posted stating that all vehicles, including school buses, are to limit idling on school premises?
- Are all vehicle loading and unloading areas at least 25 feet away from all buildings' air intakes (including doors and windows)?
- Describe how your school transportation fleet is efficient and environmentally friendly (e.g. the percentage of school-owned electric/hybrid/alternative fuel vehicles, vehicles retrofitted with emission reduction, idle reduction equipment, or other indicators of significant reductions in emissions).
- Do you have "Safe Pedestrian Routes" to school or "Safe Routes to School" designations? Are they distributed to parents and posted in the main office?
- Describe any other accomplishments made under Pillar One toward eliminating your negative environmental impact or improving your environmental footprint.

Insert Narrative Here:

A variety of transportation emission-reduction initiatives extend our commitment to the environment beyond our classroom walls. School Board policy includes reducing the negative effects of diesel exhaust on indoor and outdoor air quality, reducing bus idling time, and reinforcing smart driving practices.

Of the 16 total buses, four tier-4 buses and five tier-3 buses use diesel exhaust fluid (DEF) which is injected into the exhaust to reduce emissions. Tier-3 buses are equipped with a filtration system to reduce pollution. Tier-4 buses have a more sophisticated filtration system to further lower emissions. All 16 buses are inspected annually by the State Highway Patrol prior to the start of each school year and randomly throughout the year.

In 2012, all bus routes were reconfigured to gain maximum efficiency. This resulted in the elimination of an entire route, reducing the number of miles driven daily by 45. The district has a no-idling policy to limit idling on school premises as well as designated safe routes. A [map of designated safe routes](#) is distributed to students and parents and includes safety rules for bus riders and Ohio Department of Transportation safety tips for pedestrians and drivers in school zones.

Students reduce negative environmental impact by using efficient means of transportation to and from school. Ten percent of students walk or bike to school, while 25 percent carpool with two or more students. About 56 percent, who live beyond the one-mile transportation allowance, ride the bus to school. For those who drive, designated preferred parking spaces close to the school building are reserved for fuel-efficient and low-emitting vehicles. This represents five percent of the total number of parking spaces available.

We expect the percentage of students walking to and from school to increase after the completion of an upcoming \$280,000 Safe Routes to School (SRTS) project. Work will include the addition of sidewalks and better lighting along a section of the route that 80 percent of walkers must travel on their way to school. The 950 foot on-site pedestrian pathways will also be widened and properly lit.

Part Seven: PILLAR TWO: Net positive impact on student and staff health

2A: An integrated school environmental health program based on an operations and facility-wide environmental management system that considers student and staff health and safety in all practices related to design, construction, renovation, operations and maintenance of schools and grounds.

Provide a 1,500-word maximum narrative of how your school is progressing toward improving the quality of health for students and staff. Below are guiding questions to help frame your narrative.

Integrated Pest Management

- Do you have an integrated pest management plan in effect to reduce or eliminate pesticides?
- Do you notify parents and school employees about your pest control policies, methods of application and requirements for posting and pre-notification?
- Do you maintain annual summaries of pesticide applications, copies of pesticide labels, copies of notices and Material Safety Data Sheets (MSDSs) in an accessible location?
- Do you prohibit children from entering the pesticide area for at least eight hours following the application or longer, if feasible, or if required by the pesticide label?

Ventilation

- Does your school meet the stricter of: ASHRAE Standard 62.1-2010 (Ventilation for Acceptable Indoor Air Quality) OR your state or local code?
- Are local exhaust systems (including dust collection systems, paint booths and/or fume hoods) installed at all major airborne contaminant sources, including science labs, copy/printing facilities and chemical storage rooms?
- Have you installed energy recovery ventilation systems, where feasible, to bring in fresh air while recovering the heating or cooling from the conditioned air?

Contaminant Controls

- Radon: Have all ground-contact classrooms been tested for radon within the past 24 months?
- Carbon Monoxide: If you have combustion appliances, do you have an inventory of all combustion appliances and do you annually inspect these appliances?
- Mercury: Which unnecessary mercury containing devices have you replaced with non-mercury devices?
- Do you recycle or dispose of unwanted mercury laboratory chemicals, mercury thermometers, gauges and other devices in accordance with federal, state and local environmental regulations?
- Chromated Copper Arsenate: Have you replaced or sealed wooden decks, stairs, playground equipment or other structures treated with Chromated Copper Arsenate within the past 12 months? What percentage?
- Secondhand Tobacco Smoke: Do you prohibit smoking on campus?
- Asthma Control: Do you have an asthma management program in place consistent with the National Asthma Education and Prevention Program's (NAEPP) Asthma Friendly Schools Guidelines?
- Indoor Air Quality (IAQ): Do you have a comprehensive indoor air quality management program consistent with IAQ Tools for Schools?
- Moisture Control: Are all structures visually inspected on a regular basis and free of mold, moisture and water leakage?
- Describe any other measures regarding the school's built and natural environment that you take to protect student and staff health.

Insert Narrative Here:

Healthy indoor air quality is a requirement for a successful educational experience. Prevention of potential problems is the key. The design team for the new building was directed to specify only low VOC-containing-paints, coatings and adhesives. This was strictly adhered to and verified during construction. Airborne construction dust and debris were also a concern. Once the building envelope had been constructed but before interior construction had been completed, an air quality management plan was instituted that addressed possible contamination of installed work including the HVAC system. The plan required all openings in ductwork not being used to be taped and sealed off to prevent dust build-up. All containers of paint and adhesives were sealed when not in use. The use of gas-powered equipment within the building envelope was strictly prohibited. Once the HVAC system was allowed to be used for temporary heat, temporary Merv 8 filter media was used to prevent contamination of the ductwork and air handlers. The filters were inspected weekly and replaced as needed. New filter media was installed prior to occupancy of the building by the district. Also, the building was continuously flushed with 100 percent outside air during construction. All contractors were responsible for daily clean-up using dust inhibiting products. The district's 'no smoking on school grounds' policy was enforced for the entire site.

HVAC systems provide 100 percent outside air for all spaces. None of the air is recirculated in the building. To help save energy, all air handlers are equipped with air-to-air heat exchangers.

The new building was designed to take advantage of natural light to reduce eye strain and fatigue and increase emotional well-being. All classrooms and the majority of other regularly occupied areas provide views to the outdoors. Large windows let in ample natural light providing a more inviting atmosphere and offsetting the need for artificial light. Broad-spectrum lighting has been proven to be beneficial to human health and well-being.

Flooring materials were chosen to help improve indoor air quality and reduce maintenance while still being comfortable and attractive. All corridors and public spaces have terrazzo flooring and classrooms have rubber tile that does not require harsh chemicals or sealers to maintain. The rubber tile is also a softer material than more traditional classroom flooring types and is friendlier to teachers and other staff members who are on their feet the majority of the day.

The goals for the Asthma-Friendly Schools Project are embedded in district policies and procedures. This was true for the construction of the new building as well as for day-to-day operations. The goals include early identification; improved monitoring of students with asthma and/or any chronic disease; help for students to manage their disease appropriately; and reduction of triggers. A primary objective is to increase the number of school-based personnel who can identify asthma triggers, recognize the early signs and symptoms of an attack, and know how to respond appropriately. Board policy dictates not only preventative strategies to be in place but also on-going communication with the child's parents and physician as health conditions change. A separate policy allows students to have immediate access to necessary medications as prescribed by a medical professional and approved by parents. May school health practices provide students the opportunity for full participation in all physical activities as their health permits.

Administrative guidelines outline a comprehensive indoor air quality management program that is strictly enforced. All structures are visually inspected to check for excessive moisture levels, roof leaks, structural defects, faulty HVAC systems or improperly controlled humidity levels. Preventative maintenance programs for HVAC systems require periodic filter replacement, inspection, cleaning and disinfecting processes to eliminate causes that could be problematic. Operational directives concerning mold, pests and radon are in effect. School Board policy requires all staff to report any sign of excessive moisture levels to the Indoor Air Quality (IAQ) coordinator. Maintenance staff members make regular inspections for faulty plumbing, poor ventilation, musty smells, wet spots on ceilings, or the actual presence of mold.

The hygienic management plan instituted for the building includes an Integrated Pest Management program for the control of structural and landscape pests and calls for minimizing the use of pesticides while addressing pest control. When and if treatment becomes necessary, the policy requires that applications be made only when students and staff are not present. Pesticides may be applied on or in buildings that include classrooms as long as the application is for either the longer of four hours or the minimum time specified by the label on the pesticide, at a time after the school day has concluded, or when school is not in session. Signs must be posted at the entrances to the area in which a pesticide is applied and must be at least 8-1/2" X 11" in size, use characters that are at least 1" in height and contain the following language, "PESTICIDE TREATMENT AREA – DO NOT ENTER BEFORE (specify date & time)". All signs must remain in place for at least 24 hours. Records of pesticide applications shall be maintained for a period of three years from the date of application.

Part Eight: 2B: High standards of nutrition, fitness and quantity of quality outdoor time for both students and staff.

Provide an 800-word maximum narrative of how your school is progressing toward improving the physical health for students and staff. Below are guiding questions to help frame your narrative.

Fitness and Outdoor Time

- What is the average amount of time over the past year that each student engages in school-supervised physical education and/or outdoor time per week?
- Do you have outside classrooms or learning labs available?

Food

- Have you earned USDA's Healthier U.S. School Challenge award for school food?
- What percentage of food purchased is certified as environmentally preferable (e.g. Organic, Fair Trade, Food Alliance, Rainforest Alliance, etc.)?
- What percentage of food purchased is grown and processed within 200 miles of the school (including food grown on school grounds)?
- Does the school have an onsite garden in which the students participate?

Ultraviolet (UV) Safety

- Does your current student body participate in EPA's Sunwise Program or an equivalent program? What percentage?
- Describe any other health and fitness programs.

Insert Narrative Here:

Because our complex is situated on 130 acres and surrounded by athletic fields, woods and open green space, the majority of physical education classes are held outside as weather permits. Athletic amenities include an all-weather track, soccer fields, tennis courts, and baseball and softball fields. There is also a cross country track and hiking trail through the woods used by students, staff and members of the community. Elementary students average a minimum of 234 minutes weekly for physical education classes and outdoor recess while middle and high school students average 180 minutes weekly. This does not include those involved in sporting or co-curricular activities nor does it include outdoor class time.

Nutrition is critical for learners at all levels. According to our two food suppliers, Gordon Foods and EllenBee Leggett, cucumbers and peppers are locally grown and processed. Other fruits and vegetables are grown locally but do not meet the required guidelines for schools. Currently the food service staff is working with a nutritionist to establish an on-site garden to begin providing fresh produce that will be

served in the cafeteria. Plans are being discussed that would allow high school and middle school students to study soils to determine which foods would perform better and to jointly tend the garden. This will form the foundation of a new elective class.

While we do not formally participate in EPA's Sunwise Program, all of the program's major principles are taught in health classes and in the biology unit, "More than Skin Deep." The principles are reinforced at all levels. Students learn about the sun's harmful rays and the link to various forms of skin cancer. This learning is reinforced by staff when students will be outdoors for long periods of time (field days, sporting events, etc.) by requiring them to take measures to protect themselves from the sun.

Other health and fitness programs include "Girls on the Run" and archery classes. Girls in grades 3-8 enjoy this after-school weekly program led by staff members. The mission for "Girls on the Run" is to inspire girls to be healthy and confident using a fun, experience-based curriculum which creatively integrates running. High school students hone their skills in archery through our program sponsored by the Ohio Division of Wildlife and Troy Fish and Game.

Part Nine: PILLAR THREE: 100 percent of the school's graduates are environmentally and sustainability literate

There are many pathways to achieving a 100 percent environmental and sustainability literacy rate. Provide a 1500-word maximum narrative about how your school is progressing toward improving the Environmental Literacy for students and staff. Below are guiding questions to help you frame your narrative.

Learning and Environmental Literacy

3A: Interdisciplinary learning about the key relationships between dynamic environmental, energy and human systems.

- Does your school or district have a graduation requirement for environmental or sustainability literacy?
- What percentage of last year's graduates scored proficient or better during their high school career on state or school environmental education, sustainability or environmental science assessments?
- Briefly describe the assessment you use.
- How are environmental and sustainability concepts integrated throughout the curriculum?
- Is your curriculum aligned to the state science standards 2002 or 2010?
- What percentage of your graduates last year completed Advanced Placement Environmental Science during their school career?
- What percentage of AP students scored three or better on the Advanced Placement Environmental Science assessment?
- If your school does not conduct environmental science, sustainability or environmental education assessments, what percentage of your students scored proficient or better on the state science education assessments last year?
- Are professional development opportunities in environmental and sustainability education available to all teachers at least every other year?
- Does your environmental education curriculum pay particular attention to scientific practices, such as asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, using mathematics and computational thinking, constructing explanations and engaging in argument, and applications based on evidence?
- Do your students have meaningful outdoor experiences (an investigative or experiential project that engages students in critical thinking, problem solving and decision making) at every grade level?

- How are the sustainable elements of your building used as an educational opportunity?

Insert Narrative Here:

A major component of our Earth Science curriculum is sustainability and environmental literacy. This required graduation course incorporates research, lab work, formative and summative assessments and observing first-hand the benefits of sustainable practices. Our new building and site provide bountiful opportunities for an education in sustainability. These include but are not limited to:

- Studying the solar thermal system that pre-heats water from the municipal supply which offsets the use of natural gas.
- Comparing the impact that a “green” roof makes by absorbing large amounts of rainwater while filtering dirt/minerals through its roots to a non-vegetated roof of the same size.
- Studying the effects of solar shades mounted on windows with a southern exposure related to daylighting and reducing cooling loads.
- Measuring the energy produced by the 15 kW wind turbine and 32 kW photovoltaic solar array located on the south side of the high school.
- Examining the rainwater collection system and discussing the importance of water conservation.
- Studying the rain gardens and bioswales and the importance of protecting water shed areas.
- Calculating the energy saved by using photometric sensors to turn off lights in unoccupied areas as well as substantially natural lit areas.
- Studying the building envelope and what insulation does and why it matters.

Our curriculum takes full advantage of the site to study the natural environment. Preschoolers and kindergartners integrate the study of art with visits to our rain gardens and woods to explore shapes, colors and textures while examining leaves, plants, and insects. As students mature, this evolves into studying the relationship between plants, insects and animals on the site and the various ecosystems of which they are a part.

The elementary school integrates all subjects throughout its rainforest unit. Students investigate living and nonliving things, including the complex habitats of various plants and animals and their special adaptations. They research specific details, organize information in written form and also present their findings orally and artistically. Proportion, geometry and mathematics are inherent in exercises where students measure and graphically represent their favorite rainforest animal or insect. They learn about the purpose of The World Wildlife Fund and commit to do their part to preserve rainforests as well as their local environment.

A little rain doesn't stop learning outdoors. Our school features two 300-square-foot areas of roof that drain into rain barrels. One of the areas has a vegetated or green roof. Students study the plants and soil of the green roof and the amount and quality of water from both roof areas. Biology and natural science teachers integrate these features into their classes.

At the core of the high school natural sciences curriculum is the biodiversity unit. In order to investigate biodiversity at the species level and the ecosystem level, students measure the amount of diversity in six different habitats, all within walking distance of the school. They learn how to sample a small area and apply that data to a larger area. The goal is to show how human disturbance affects the biodiversity of habitats. Students further explore how humans negatively impact habitats by investigating the abiotic factors and biodiversity at the edges of these habitats. Students also use the local woods to observe the effect of an invasive species, honeysuckle, on local plant and animal life.

All staff has the opportunity to participate in professional development in environmental and sustainability education through the district energy consultants and/or through the real-time monitors positioned in each building. Professional development is also offered quarterly to all science teachers.

Tracking the success of these programs is critical. We use the Ohio Graduation Test, ACT End-of-Course (EOC) exams and teacher-created formative and summative assessments. The EOC exams not only measure proficiency in science but also college and career readiness. All science curricula are aligned with the current state educational standards. The results of academic efforts speak for themselves. The average composite ACT score for Milton-Union in 2013 was 22 and the high school graduation rate was 95 percent, one of the highest in Miami County.

Students in the middle and elementary grades also perform well. The composite scores for students in grades 4-8 for reading, mathematics and science on the 2013 Ohio Achievement Assessment demonstrated the following: two grade levels resulted in more than two years' growth in one year, one grade level between one and two years' growth and one grade level on track.

Part Ten: Element 3B: Use of the environment and sustainability to develop STEM content knowledge and thinking skills to prepare graduates for the 21st century technology-driven economy.

Provide an 800-word maximum narrative of how your school is progressing toward improving the use of the environment and sustainability to improve STEM knowledge and problem-solving skills. Below are guiding questions to help frame your narrative.

- Do your students graduate with a robust general science education that includes a deep understanding of life, physical and earth sciences?
- What percentages of enrollment are in environmental sciences, earth sciences, biological sciences, statistics and STEM post-secondary school or career-intended focus?
- Does your curriculum provide a demonstrated connection between classroom content and college and career readiness, particularly to post-secondary options that focus specifically on environmental and sustainability fields, studies and/or careers?
- Does your curriculum provide career preparation, career-technical education programming, agricultural and environmental systems career field, college-level science or math course enrollment or specific science/math assessments with an environmental focus?

Insert Narrative Here:

Milton-Union students are required to show a high degree of proficiency and understanding in life, physical and earth sciences prior to graduation. Science classes are organized around experimentation and experiential learning while focusing on real-world applications of course content. Our STEM curriculum is one of the most popular with students. Currently, 73 percent of high school students are enrolled in the program. The majority of our STEM students pursue careers related to their course work. Our job fair attempts to connect students with professionals in their field of interest.

A favorite activity of our STEM students is participation in the Envirothon sponsored by the Ohio Department of Natural Resources. Its focus is to stimulate, reinforce and enhance interest in the environment and natural resources. Competitive teams test their knowledge of soils, forestry, wildlife, aquatic ecology and current environmental issues. Many students also participate in the Miami County Science Fair, exhibiting projects focusing on various aspects of sustainability.

The progress of our STEM students is measured by ACT End of Course (EOC) exams. These exams help us determine if our program's goal of preparing our students for college and STEM-oriented careers is being achieved.

Milton-Union has a cooperative education agreement with the Miami Valley Career Technology Center. The MVCTC has as its goal the preparation of students for either entering the workforce directly after high school or preparing them for career-oriented post-secondary education. Students are able to enroll and pursue work in career-technical education in multiple sustainable fields. Program offerings in

agriculture resource management include livestock care, plant and soil management and conservation. Natural resource management includes fisheries and wildlife management, park facility management and environment and hazard protection.

Part Eleven: Element 3C: Development of civic engagement knowledge and skills, and students' application of these to address sustainability and environmental issues in their community.

Provide a 500-word maximum narrative of how your school is progressing to improve civic and community partnership toward sustainability. Below are guiding questions to help frame your narrative.

Community and Civic Engagement

- What percentage of last year's graduates scored proficient or better on a service learning or community engagement skills assessment?
- Are your students required to conduct an age-appropriate civic/community engagement project around a self-selected environmental or sustainability topic at every grade level?
- Do you partner with local academic, businesses, government, nonprofits, informal science institutions and/or other schools to help advance the school and community toward sustainability and other environmental issues?
- Do you have outdoor classrooms on your grounds that include native plantings or a community garden? If yes, how do you use them to teach an array of subjects in context, engage the broader community and develop civic skills?
- What are other indicators or benchmarks of your progress toward the goal of 100 percent of your graduates being environmental and sustainability literate?

Insert Narrative Here:

To help students become involved citizens and life-long stewards of the environment, Milton-Union encourages civic engagement and community partnerships in a variety of innovative ways. They include:

- **American Government Week**
Milton-Union high school seniors have been participating in this unique program for nearly 40 years. All seniors take part in real-world, hands-on learning experiences as they discover the various services our local government provides to its citizens. For example, students learn how microfiltration at the wastewater treatment plant turns waste water into treated water and is emptied into the river. At the park, students spread recycled wood chips around the playground equipment and pick up trash along major roadways. Some students work in conjunction with the Town Council and hold a mock council meeting. In fact, the West Milton Village Council actually supported and enacted a student-sponsored proposal. American Government Week allows students to realize two important concepts – that environmental issues permeate nearly all aspects of our lives and that each of us can have a positive impact on the environment no matter where we live or what career we choose.
- **Partnership with Master Gardeners of Miami County**
The school collaborates with the Master Gardeners of Miami County to provide outdoor learning for students. While maintaining native plants in school courtyards, gardeners teach students the proper time and technique for pruning, the types and purposes of specific plants, the proper depth for mulching and other principles of plant care.
- **Partnership with Miami County Park District**
Our school enjoys strong ties with the Miami County Park District. The Milton-Union Superintendent and a Board of Education member serve on its committee. The park district also sponsors an after-school nature hour with second- and third-grade students to teach and reinforce the importance of environmental and sustainability principles.
- **Community service**
Students participate in community outreach activities such as collecting coats for the needy

through a local Operation Cover Up program. Students also collect pop tabs for the Ronald McDonald House; proceeds benefit families-in-need staying at the Ronald McDonald House. We also participate in Box Tops for Education program. With the cash earned, our local PTO provides items to the elementary school. Initiatives like this help teach students to think about the possibilities of reusing items rather than discarding them as waste.

- **Habitat for Humanity Club**

High school students help build homes for those in need by collaborating with Habitat for Humanity, a nonprofit organization that acquires and promotes the use of a considerable amount of reused and repurposed building materials.

- **Water safety**

- After personnel from the Ohio Department of Natural Resources teach eighth graders about water safety, they canoe down the Stillwater River.

- **Earth Day activities**

The second-grade students and staff partner with the Miami County Soil and Water Conservancy to plant trees on Earth Day.

- **COSI learning lab**

The Center of Science and Industry mobile learning lab visits our elementary classes each year, captivating students with science-related topics.

- **County science fair**

Participation in the county science fair gives eighth-grade students the opportunity for in-depth exploration of science topics which may include solar power, water pollution, energy production or other environmental issues.

Part Twelve:

Submit your application with narrative to OhioGreenRibbonSchools@education.ohio.gov.

Please attach any supporting documents mentioned in the narrative to show the qualifications of your school.

If you have questions during this application, please contact the executive director, Environmental Education Council of Ohio at director@eeco-online.org.