SECRETARY OF THE ARMY ENVIRONMENTAL AWARDS 2023

MINNESOTA ARMY NATIONAL GUARD
SUSTAINABILITY, TEAM

Program Management

Technical Merit

Orientation to Mission

Transfer-ability

Stakeholder Interaction

Program Impact

The Minnesota Army National Guard's (MNARNG) award-winning Sustainability Team has always emphasized the intrinsic connection between sustainable facilities and mission readiness, now and for the future. Charged with securing the viability, resiliency, and efficiency of a state installation comprising 62 facilities in 58 communities along with the 53,000-acre Camp Ripley Training Center and 1500-acre Arden Hills Army Training Site, over the past two years, the Team has focused on renewable energy, waste diversion, and water protection. Their efforts directly support the MNARNG's eMS objectives in pursuit of energy, water, and waste resiliency goals, as well as the MNARNG's triple bottom line: mission, environment, and the community are paramount to success in sustainable infrastructure and design. The MNARNG Sustainability Team works with staff and units to instill sustainable practices within all operations, empowering all components of the organization to enhance environmental activities.

The MNARNG Sustainability Team is:

LTC Troy Fink, Construction & Facilities Management Officer	MAJ Mike Thompson, Deputy Construction & Facilities Management Officer
CW4 Justin Knippel, Env Branch Chief	Mr. Jay Brezinka, Env Program Manager
Ms. Lori Ruff, Sustainability Manager	Mr. Zack Sonntag, Sustainability Analyst
Mr. Kyle Kabanuk, Facility Energy Manager	Mr. Russel Howard, Water Program Manager

Over the past two years, the Team has tracked the benefits of new investments in infrastructure and technology. In partnership with CenterPoint Energy, the Team has completed over 30 energy audits at MNARNG facilities throughout the state, identifying points for improvement and prioritizing upgrades to building envelopes and systems. To preserve the function of aging facilities and infrastructure, the Team implemented a leak detection program that has saved millions of gallons of water over the past few years. The waste reduction and diversion measures already instituted have slashed the MNARNG's solid and hazardous waste streams to a minimum. The Team also expanded efforts to incorporate organic waste as a target, achieving a 40% diversion rate via composting programs. At present, this means around 40,000 pounds of organic material diverted, building toward a goal of 60% waste diversion. To protect water resources and the Mississippi River, the team is now completing construction on three stormwater infiltration basins at Camp Ripley, adding to two already in operation; with this project, the Team will effectively capture 95% of all stormwater in the cantonment area.

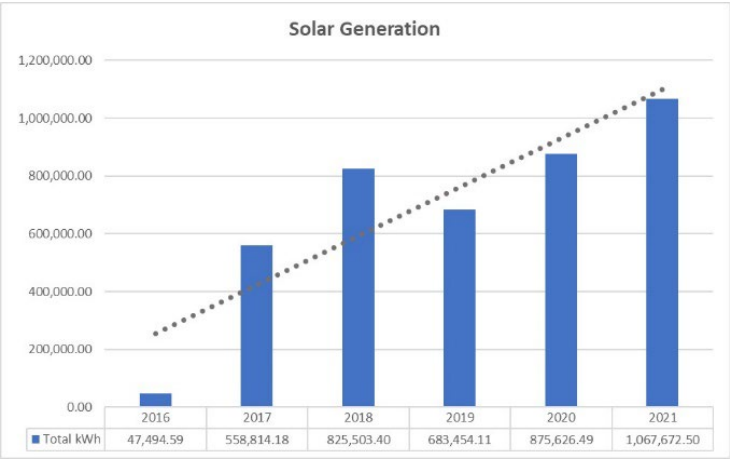
The Sustainability Team members bring together expertise across MNARNG directorates and offices, allowing them to cohesively address the sustainability goals of the organization in more cost-effective and resource-efficient ways. Environmental objectives are embedded into the operations and designs of the MNARNG's facilities, and the Team has implemented comprehensive sustainability plans and policies aimed to achieve eMS sustainability goals.

These goals are integrated into operations from the Soldier to the Adjutant General, forming the foundation of the MNARNG's Master Plan and Campaign Plan.

- The Joint Sustainability Master Plan, MNARNG Environmental Protection and Enhancement Policy – Regulation 200-1, and the MNARNG Campaign Plan outline goals and strategies for achieving benchmark reductions in energy use, increasing recycling, promoting a "greener" fleet with reduced emissions, and eliminating waste streams.
- The Adjutant General's Campaign Plan also emphasizes sustainability projects vital to the MNARNG's mission, particularly areas related to energy conservation, renewable energy production, building new facilities to the LEED or SB2030 design standards, and furthering the Camp Ripley Army Compatible Use Buffer (ACUB) & Sentinel Landscape programs.
- The Team maintains and updates all conventional management plans, including hazardous waste management, spill management, wellhead protection, etc. This year, they implemented a new Integrated Solid Waste Management Plan that reflects the diversion of organic materials and updated the Energy and Water Plan for the state.

Team members are also participants in the MNARNG Sustainability Working Group (SWG), a cross-directorate group that meets monthly to promote and track sustainability measures. They work with the Minnesota Pollution Control Agency (MPCA) on compliance activities and maintain licensing or permitting current for stormwater, underground storage tanks, hazardous waste, and National Pollution Discharge Elimination System. The SWG provides support for the Team's initiatives; reports from the energy audits throughout the state have been presented to the group to best coordinate planning for future upgrades and remodels.

The MNARNG and the State of Minnesota have set ambitious goals for energy resilience and independence and the reduction of waste and water use. State energy goals exceed federal objectives, calling for 15% water use reduction and 25% increase in sustainable procurement purchases by 2025, 30% reduction in fleet petroleum use and energy use intensity reduction of 30% by 2027, and solid waste diversion rates of 60% by 2030. To meet these goals, the Team continuously works toward 3% annual energy reduction and 2% water use reduction across the MNARNG installation, in conjunction with expanded recycling and composting to reduce waste and conversion to greener vehicle fleets.



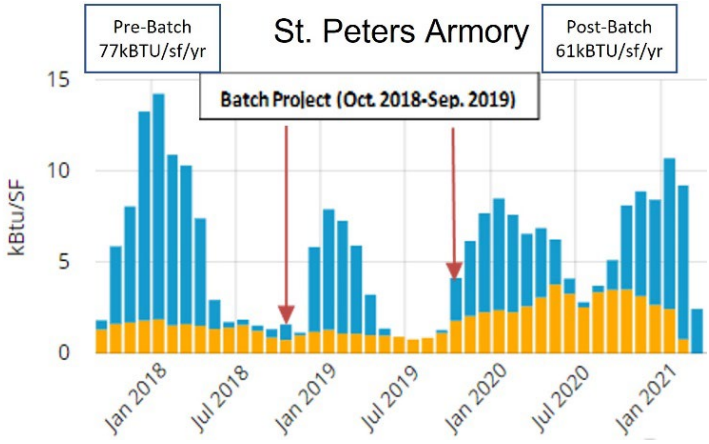
Energy Conservation: The Team continues to transform the MNARNG's overall energy footprint. Many systems that were running on natural gas are being converted as maintenance or end-of-life replacement to pair with renewable energy sources. At Camp Ripley, the Team is pursuing a microgrid that will permit energy islanding in emergency situations, with several one-megawatt generators linked to the solar field. The Team has encouraged geothermal

systems at new construction; based on the existing sites where these have been installed, energy savings of around 45% have been documented.

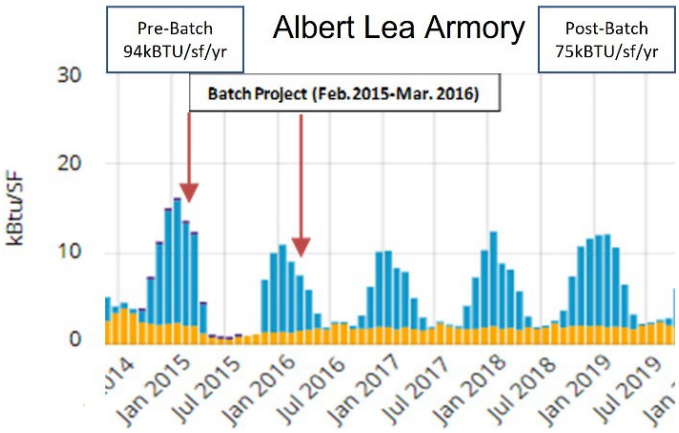
Energy audits are being used as a tool to both plan future remodel projects and confirm the efficacy of remodels already completed. Under a partnership with CenterPoint Energy, a certified energy auditor conducts an inspection of the facility envelope and equipment, identifying opportunities for energy efficiency improvements or use reductions. Where natural gas systems are in place, equipment can immediately be installed to reduce gas usage; other immediate upgrades include low flow faucet aerators and showerheads, pre-rinse spray valves, programmable thermostats, and weather stripping. Following each site visit, the Team receives a report with detailed recommendations, including an analysis of the previous twelve months of gas bills to track where energy is being consumed. For larger scale improvements, the report provides a roadmap for an investment strategy.

The Team has implemented batch projects for improvements on a three-to-five-year timeline. Under this process, multiple sites will be outfitted with new boilers, for instance, allowing the Team to achieve discounted costs on equipment and installation. These upgrades generate around 20% savings in energy use at each facility. This year, the Team had sufficient data to demonstrate impacts from improvements at the St. Peter and Albert Lea armories. Making these armories both energy responsive and utility friendly has demonstrated that the MNARNG can upgrade its facilities to run at highly operable measures while maintaining a standard of building occupant comfort. The energy usage at all sites is captured via the MNARNG's online utility benchmarking portal. The Team requested energy audits at both of these sites last year.

Prior to mechanical systems upgrades installed in 2019, St. Peter Armory was requiring approximately 77 kBtu per square foot of utility demand. The renovations there were extensive, including removing and replacing ventilation air systems, exhaust air systems, ceiling grilles, diffusers, and branch ductwork. These changes were accompanied with a new hot water boiler, pumps, variable frequency drives, heating water distribution piping, unit heaters, and an upgraded equipment control system. Since completion of the renovation, the Team has documented a 19.8% decrease in energy use, down to 61kBTU/SF. This reduced consumption offset rising utility prices over the same period, cutting overall expenditures by 4%.

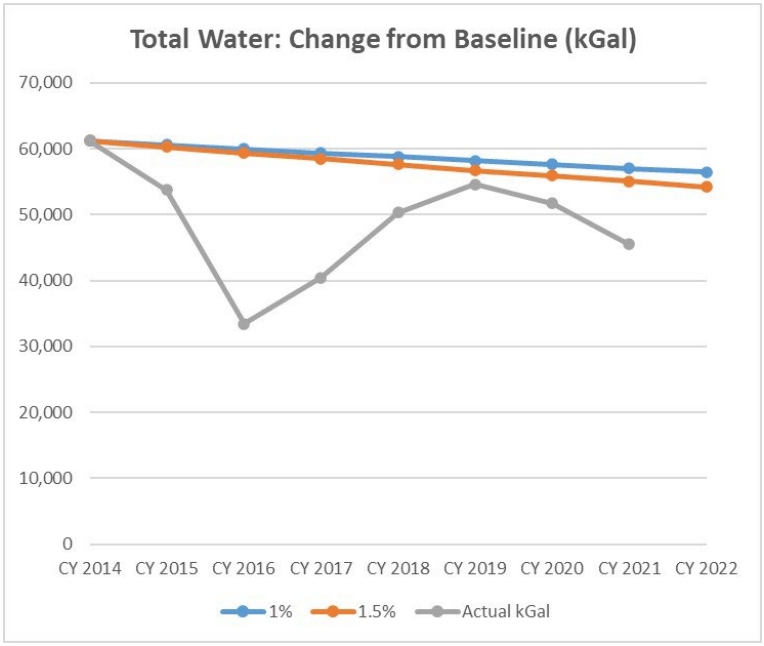


Albert Lea Armory has been similarly tracked; this year, the Team documented a 20.2% decrease in energy consumption from 94 kBtu per square foot prior to renovation in 2016 to 75 kBtu today. Albert Lea Armory's improvements focused on the building envelope, including installation of a new roof, new windows, and insulation. The Team has been able to use the data from these two sites with different strategies to validate plans for ongoing improvements at other armories throughout the state. Based on the particular site, and with the integration of energy audit reports, the Team is able to make sound recommendations on the appropriate balance of envelope and systems improvements to prioritize. Further opportunities for energy savings at the



armories were also identified, including simple behavioral fixes, like setting the water heaters from 144°F to 120°F and reducing the unoccupied setback temperatures just a few more degrees.

Waste Reduction: The Team has previously piloted composting programs at the dining facilities most heavily used on Camp Ripley, and they continue to explore the opportunities to expand and improve composting as a waste diversion strategy. An outreach campaign was launched this summer to increase recycling and composting of organic waste. With roughly 40% of organic material now being diverted, the Team has been establishing metrics and measures to reach a diversion goal of 200,000 pounds of organic materials. Organic material diversion from landfill disposal will effectively contribute to the management of all possible waste streams. Per eMS goals, the Team strives for 60% solid waste diversion by 2030.



Water Conservation: The Team has implemented a leak detection program to monitor and repair aging infrastructure across the state; many facilities are nearly 100 years old, and the Minnesota freeze-and-thaw cycle poses a challenge in maintaining underground pipe systems. At Camp Ripley, for instance, the Team caught an underground leak that shed 15,000 to 20,000 gallons of water per day. The training site operates its own wastewater treatment plant on post, and with monitoring and usage reviews, the Team found the disparity between water pumped out versus intake. Working with a crew of plumbers, the Team inspected the hydrant systems and isolated water service to locate and repair the leak. Over the past five years, water use at Camp Ripley Training Center has been nearly halved, from 60 million to 33 million gallons per year.

The Team has also continued its Smart Salting program. Salt is the most cost effective treatment available to control ice on MNARNG facilities, but overuse of salt leads to sodium chloride washing off roads and into surface and groundwater systems. Once chlorides enter groundwater, they persist indefinitely, with desalinization the only treatment possible. MPCA water monitoring has shown that salt concentrations are increasing in lakes, streams, and groundwater around the state, in some cases exceeding the standard for drinking water (250 mg/L) affecting taste and odor. High concentrations of chloride in groundwater can cause

chloride in streams to exceed the chronic aquatic criterion developed to protect fish and other aquatic life. Overuse of salt also corrodes vehicles and infrastructure, posing significant long-term costs. The Team's program has emphasized education and training to limit salt application.

To protect the broader watershed, the Team has constructed three new stormwater infiltration basins that will capture 95% of stormwater runoff at Camp Ripley's cantonment area. These measures directly benefit the ecology and water quality of the Mississippi River adjacent to the training site. The three new basins can hold 6.5million gallons, allowing the runoff to infiltrate to groundwater, with any pollutants naturally filtered out. The basin construction is also part of the MNARNG's greater plans for climate change resiliency. Large-scale rain events on par with 100-year storms are becoming more common, and these basins have been designed to meet this capacity while also providing for future new construction. The Team designed the system to capture 95% of the runoff from impervious surfaces for rain events up to one inch, which historically covers approximately 80% of the rain events that occur at Camp Ripley. The basins also help reduce flooding downstream as the stormwater no longer directly discharges into the river.

The Team is the cornerstone of the MNARNG's long-term sustainability strategy, prioritizing resilience and independence to safeguard operations throughout the state. The Team's work has helped to slash waste and grow efficiencies across waste, water, and energy; their efforts translate into avoided costs and more effective use of MNARNG funds to support the MNARNG mission. The Team continues to seek out ways to become more impactful. One of the most important projects for mission readiness is the construction of a microgrid as part of energy security goals. The Team is currently overseeing installation of cables and backup generation capacity that links to Camp Ripley's solar arrays. An automated system will manage the energy load for the grid. Utility costs for the MNARNG annually runs to around $5 million, even with approximately a 20% energy use reduction over the last eight years. As utility costs continue to rise, it is essential to the MNARNG's operations that energy use intensity and demand be limited. The Team is working now to create energy independence for the MNARNG so that training and readiness are insulated from future utility costs. Throughout the MNARNG, the sustainability ethic is well-rooted, and all personnel can join in the Team's mandate for continuous progress in stewardship.

Team members conduct a Site Assistance Visit for Environmental Requirements (SAVER) at all MNARNG facilities; they are able to complete one-on-one training and resolve any issues a unit may be having. During these visits, they will spot-check dumpsters and review systems to ensure that recyclables are being recaptured and there are no indications of leaks or energy waste due to equipment issues. The Sustainability Team also coordinates both classroom and online environmental training to keep environmental compliance officers certified and ensure staff and Soldiers have had the appropriate briefings. As partners in the state's Buildings, Benchmarks and Beyond program (B3), the Team has also been able to integrate monitoring and auditing tools that create a more comprehensive record of MNARNG facilities, which in turn promotes programmatic continuity for tracking trends and setting goals.

The units and facilities they serve are the Team's primary client stakeholders. As part of the training efforts above, the Team updated Sustainability modules in the MNARNG's Blackboard system this year. They also established a facility managers working group to collect data on

energy, waste, and water use and encourage those managers to share their ideas for improvement. For families of deployed Soldiers, the Team participates in the Family Training Readiness weekend events, presenting information on resilience, mindfulness, and environmental engagement as strategies for preserving mental health—the sustainability of the MNARNG rests not just in efficiency and reduction initiatives, but also in its human contributors. Team members continue to take part in State working groups from the Office of Enterprise Sustainability (OES). The OES supports state agencies by helping to ensure state government operations save money by implementing socially and environmentally responsible solutions. The OES uses Results Based Accountability practices to identify current condition/status baselines, develop metrics for implementation and execution across state agencies, and is a leading force in the state for sustainability. Two Team members sit on the OES committee working groups and take an active role in assisting state regulators in defining objectives for state agencies. The Team assists in hosting the annual Water Festival for school children on Camp Ripley each year; the event teaches participants about water conservation and water quality measures enacted by the MNARNG. At the MNARNG's community Open House events, the Team hosts the public as well as partners like Minnesota Power and other utility partners, with booths on energy savings and renewable energy features. Public utility boards are welcomed to visit the MNARNG's solar arrays as well. Their *Steward* Environmental newsletter is another avenue for outreach to communicate informational, scientific, and educational articles relevant to environmental programs for the MNARNG.