

Item 18 Greenhouse Gas (GHG) Emissions/Carbon Footprint

The guidance provided below will assist proposers and their consultants in responding to Item 18 Greenhouse Gas (GHG) Emissions/Carbon Footprint in the [Environmental Assessment Worksheet \(EAW\) form](#). For additional guidance on greenhouse gas emissions calculations and Item 18, refer to the [Minnesota Environmental Quality Board \(EQB\) EAW guidance for climate and adaptation and resilience](#).

18a. GHG quantifications

This section provides recommendations of tools to quantify GHG emissions, in which MPCA is the responsible government unit (RGU) per [Minn. R. 4410.4300](#).

MPCA recommends users start with either the EQB Calculator or EPA's Simplified GHG Emissions Calculator (SEGC). Where available, additional tools can provide more refined results because of the requirement of detailed information. While most of tools recommended were designed by different organizations with different audience/purposes, and not EAW's for the State of Minnesota; after careful review, MPCA has determined that these tools are acceptable for use in an EAW application.

The level of data input and in-depth knowledge of the project varies with each tool. More refined data input can result in more refined results.

There are two sections necessary in quantifying GHG emissions under 18a:

- **Construction:** This includes GHG emissions associated with the construction of the project (i.e. new roads, new buildings, increasing land use for landfills). Project proposers should evaluate:
 - materials used during the constructions (i.e. tons of concrete, asphalt, etc.)
 - mobile emissions including construction equipment and increased traffic because of the construction work,
 - any change in land use (i.e. grassland converted to an impervious surface because of a new building); and
 - construction waste (i.e. any material that is disposed of because of the project).
- **Operations:** This includes GHG emissions associated with the day-to-day activities for the project such as:
 - combustion emissions from mobile equipment (i.e. vehicle activity such as transporting waste from the site to another location)
 - combustion from stationary equipment (i.e. energy consumption/usage from building operations)
 - non-combustion stationary equipment (i.e. enteric fermentation or wastewater treatment projects); and
 - waste management emissions (i.e. unwanted material that leaves the site)

Depending on the project, project proposers and their consultants may need to use a combination of tools to address all components of the project.

Note to Proposer: Some tools have other capabilities are not discussed in this document. Outputs of the tools vary. Users should convert units to short tons per year.

Table 1: GHG calculators.

Calculator name	Website	User guide link	Applicability (EAW category)	Description	Limitations (related to preparing EAWs)
Minnesota Climate Calculator	Climate assessments Minnesota Environmental Quality Board	Climate Calculator, Version 1.1 Additional supporting guidance documents: <ul style="list-style-type: none"> • Anaerobic Digester Guide. • Feedlot Guide. • Wastewater Guide. • Landfill Guide. 	All categories (with limitations)	An excel-based calculator designed specifically to address the quantification of GHG emissions from any potential project submitting an EAW.	Depending on the project category, the tool may be limited by the defaults or data entry. For example, the tool does not address the land application of biosolids from wastewater treatment plants.
EPA's Simplified GHG Emissions Calculator	Simplified GHG Emissions Calculator US EPA	Simplified Guide to Greenhouse Gas Management for Organizations	All categories (with limitations)	An excel-based calculator designed to quantify emissions from several emission sources. This tool is excellent for quantifying emissions from mobile sources.	The tool does not provide calculation for emissions from feedlots and wastewater.
MPCA's Feedlot Tool	p-ear1-14a.xlsx	MPCA Feedlot Tool User's Guide	Subp. 29 Animal feedlots	A Minnesota specific excel-based calculator designed specifically to address the quantification of GHG emissions from feedlots (cattle, swine, and poultry).	There is limited customization of manure management strategies.
COMET Farm Tool	COMET-Farm Login	Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory	Subp. 29 Animal feedlots	Web-based accounting tool that provides a full GHG assessment from on-farm emission sources based on specific operational inputs such as manure management strategies, feed, and housing.	Requires a high level of data input (such as crude protein).
Energy Performance and Carbon Emissions Assessment	ECAM v3	UserManual FinalVersion.pdf Additional supporting guidance document:	Subp. 18 Wastewater systems	Web-based tool to model GHG emissions from the Urban Water Sector. For EAWs, a project proposer should only focus on the treatment stage. A support document is available to help	Requires a high level of data input (such as nitrogen load in the influent).

Calculator name	Website	User guide link	Applicability (EAW category)	Description	Limitations (related to preparing EAWs)
and Monitoring Tool		ECAM Guidance		project proposers understand how to use the tool to respond to EAW item 18.	
GREET 2025	GREET Department of Energy 45ZCF-GREET	Guidelines to Determine Life Cycle Greenhouse Gas Emissions of Clean Transportation Fuel Production Pathways Using 45ZCF-GREET	Subp. 5 Fuel conversion	There are multiple excel-based GREET Models. Project Proposers of fuel conversion projects, such as ethanol production, should use the 45ZCF-GREET Model.	Requires a high level of data input and thorough understanding of the inputs. Certain parameters are fixed and may not be changed by the user.
WARM	Versions of the Waste Reduction Model US EPA	Documentation Chapters for Greenhouse Gas Emission, Energy and Economic Factors Used in the Waste Reduction Model US EPA	Subp. 5 Fuel Conversion and Subp. 17 Solid waste	Excel-based comparative tool for reviewing the differences in GHG emission across different waste management practices.	The tool does not include biosolids from wastewater treatment facilities, nor manure from feedlots.
Anaerobic Digestion Screening Tool	Anaerobic Digestion Screening Tool Global Methane Initiative	User Manual, AD Screening Tool	EAWs where ADs are involved.	Excel-based tool designed as a pre-feasibility screening for multi-feedstock ADs. This tool can factor in multiple sources and combinations of feedstock, including biosolids from wastewater, animal manure, and municipal solid wastes.	Requires a high level of data input.

18b. GHG assessment

This section asks project proposers to discuss the possible mitigation of GHG emissions in three parts:

- Identify reasonably available mitigation options. Describe strategies or technologies that reduce construction and/or operational emissions (e.g., material substitutions, electrification of on-site equipment and fleets, energy efficiency, methane capture, organics diversion, process changes).
- Quantify expected reductions. For each selected mitigation, proposers should attempt to quantify the reduction in per year and summarize key assumptions so a reviewer could reproduce the estimate. Explain why a mitigation strategy is preferred.
- Discuss net lifetime emissions and state goals. Provide the project's net lifetime discuss alignment with [Minnesota Next Generation Energy Act goals](#).

Further reading

For more information related to these topics visit:

- [Revised Environmental Assessment Worksheet \(EAW\) Guidance](#)
- [Climate Action Framework | Our Minnesota Climate](#)
- [Greenhouse gas emissions in Minnesota 2005-2022 Legislative Report](#)
- [Intergovernmental Panel on Climate Change Assessment Report \(IPCC 6\)](#)
- [2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories](#)