

Environmental Assessment Worksheet Form

Section/Item 7 Guidance

A guide to Item 7 of the [Environmental Assessment Worksheet \(EAW\) form](#)

EAW Item 7. Climate adaptation¹ and resilience²

Following the recommendations provided in EAW items 7a. and 7b. below will enable the proposer to clearly document in the EAW how to make connections between local climate trends and project components. This will allow reviewers a standardized method to evaluate climate change impacts efficiently and effectively on the proposed project, the surrounding area, and how the impacts will be considered in the design, construction, operation, and maintenance of the project over the projected lifetime. For additional guidance, refer to the [Minnesota Environmental Quality Board Environmental Assessment Worksheet \(EAW\) guidance for climate adaptation and resilience](#).

Note to Proposer: All figures and tables shown below shall be completed and specific to your project and inserted into the EAW to be submitted.

7a. Describe the climate trends in the general location of the project and how climate change is anticipated to affect that location during the life of the project.

Describe historic climate trends³ and future climate projections⁴. Determine historical climate trends data for conditions at the start of the project (1980–present) and future projected climate data for conditions during the life of the project (present–lifetime).

To standardize climate review, address the following four recognized Climate Trends in Minnesota and two Projected Changes that are anticipated to affect the project location during the life of the project.

Climate Trends (data-driven; changes that are already occurring):

- Average annual temperature increasing
- Average annual precipitation increasing
- Cold weather warming
- Heavier, more damaging rains

Projected Changes (model-driven; changes that are projected to occur in the coming years and decades):

- Increasing risk of heat waves
- Increasing risk of drought

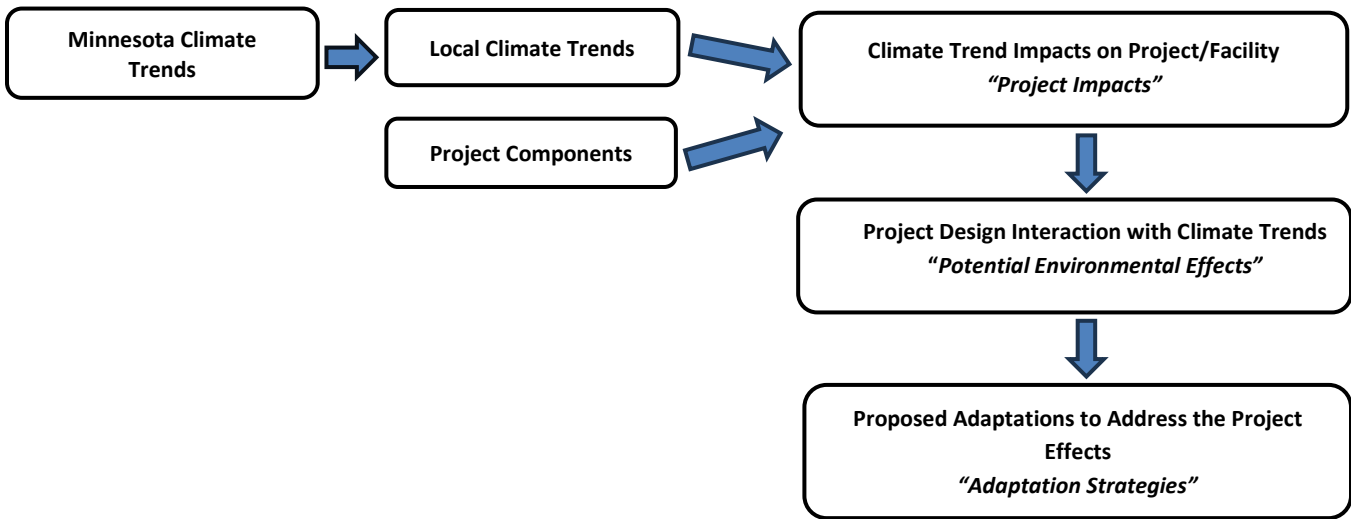
¹ **Climate Adaptation:** Taking action to prepare for and adjust to both the **current and projected** impacts of climate change. For both natural and built systems, humans may intervene to help adjustment.

² **Climate Resiliency:** The capacity of social, economic, and environmental ecosystems to cope with a hazardous event, trend or disturbance resulting from climate change.

³ **Climate Trend:** The observed change in climate variables over a specific period, based on historical data and provide insights into how our climate has evolved.

⁴ **Climate Projection:** Predictions of future climate conditions based on mathematical models. Projections consider different scenarios, such as greenhouse gas emissions, land use changes, and other factors.

Figure 1. Climate adaptation and resilience review process



Determine the general location of the project. Establish the most representative geographic unit or location of the project (County/Local Trends).

This item is intended to lay the groundwork for understanding how climate change is likely to affect the area where the project is located throughout the life of the project, shown as “Project Impacts” in Figure 1.

Historic climate trends and projected climate changes are listed in the first column of Table 1 below. If additional climate trends or projections are included, assess any impacts through each Resource Category and Project Component in 7b.

Provide the resource tools used to determine climate trends and projections for the project area in Table 2 below.

Note that when running Minnesota ClEMAT, seasonal timeframes may illustrate predicted climate changes better than the annual timeframe.

Table 1. Summary of reported climate trends (examples shown in italics).

State of Minnesota historic climate trends (data-driven) and projected climate changes (model-driven)	County/local trends	Project impacts (climate effects on project location)
Average annual temperature increasing		<i>e.g., Site may be subject to increased air conditioning loads to grid, interior and exterior infrastructure.</i>
Average precipitation increasing		<i>e.g., Increased run-off and erosion may affect soil/site stability.</i>
Cold weather warning		<i>e.g., Decreased snow cover may affect vegetation cover that leads to increased soil erosion.</i>
Heavier, more damaging rains		<i>e.g., Vegetation changes, stressors, more exposed soils in winter.</i>
Increasing heat waves		<i>e.g., Construction materials may break down quicker in high heat conditions.</i>
Increasing risks of drought		<i>e.g., Limitations on groundwater, surface water for use in dust reduction.</i>
Optional: Additional relevant climate variables		

Table 2. Climate trends and projections resource tools

	Climate trend tools	Tools used in the EAW	How the tool was used
	Options from Environmental Quality Board (EQB) guidance		
Current trends	Minnesota Climate Trends (state.mn.us)		
Projected changes	Minnesota Climate Trends (state.mn.us)		
Climate hazard projections	Climate Mapping for Resilience and Adaptation (CMRA) Assessment Climate Resilience Evaluation and Awareness Tool (CREAT) Climate Change Scenarios Projection Map Risk Factor		
Additional information	National Climate Assessment (NCA4 Volume II or more recent), especially Chapter 21: Midwest Chapter 28: Reducing Risk; Maps in Chapters 6 & 7. Intergovernmental Panel on Climate Change Assessment Report (IPCC 6 or more recent) Interactive Atlas National Oceanic and Atmospheric Administration (NOAA) Climate.gov		

7b. For each resource category in the table below: describe how the project’s proposed activities and how the project’s design will interact with those climate trends. Describe proposed adaptations to address the project effects identified.

To understand how this project and the climate trends identified in 7a could impact the environment, it is important to understand what components of the project are being affected. Project Components include all the new (or removed) elements of this project that could be affected by climate trends, including elements of the site design and the processes/activities happening at the site.

For the Resource Category “Project Design,” determine 3-4 main components of the Proposed Activity. Describe how the project’s proposed activities and how the project design will interact with the described climate trends and projections, described in 7a. Describe proposed adaptations to address the climate change risks and vulnerabilities.

Examples of main project components (pick 3-4):

Site design (physical layout)

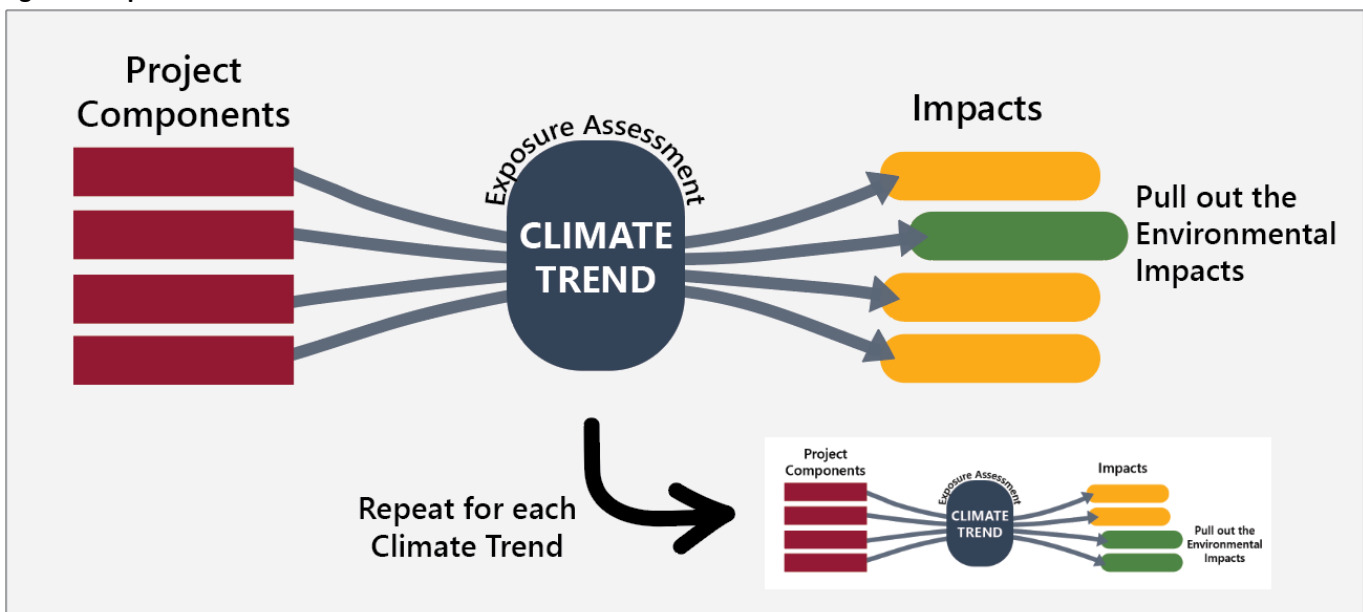
- More, less, or altered buildings.
- More, less, or altered impervious surfaces.
- More, less, or altered habitat/ green space.
- More, less, or altered tree cover.

Site processes(activities)

- More, less, or altered hazardous waste.
- More, less, or altered products /by-products/ waste.
- More, less, or altered transportation to and from the site.
- More or less emissions (covered in the GHG section).

Consideration of the interactions between the project components with the climate trends follows the Exposure Assessment process as illustrated in Figure 2, below. Each individual project component is compared against the identified climate trend to evaluate the potential impacts and determine which may impact the environment.

Figure 2: Exposure assessment



For the Resource Category “Project Design” in Table 4 below, describe how three or four of the project’s components (Site Design and Site Processes) will interact with each climate trend and projection, shown as “Potential Environmental Effects” in Figure 1, and column four in Table 3 below. Describe proposed adaptations to address the project effects and build resilience to climate change, shown as “Adaptation Strategies” in Figure 1 and column five in Table 3.

The remaining Resource Categories (Land Use, Water Resources, Water Resources, HazMat, and Fish/Wildlife/Plants/Sensitive Resources shall be addressed in their respective item numbers.

Note to Proposer: Once completed specific to the proposed project, insert Table 3 in the EAW in place of the table shown on page 3 on EQB’s EAW Form.

Table 3: Interaction of proposed activities with each climate trend and projection listed in 7a (examples are shown in italics).

Resource Category	Climate Trends and Climate Projections	Project Components	Potential Environmental Effects <ul style="list-style-type: none"> • Identify climate change risks & vulnerabilities. • Identify long-term impacts that climate conditions pose to proposed activities. 	Adaptation Strategies (with applicable timeframe – construction to end of expected lifespan)
Project Design	Average annual temperature increasing	<i>Increased impervious surfaces.</i>	<i>Environmental impact not foreseen with interaction between impervious surfaces and average temperature increasing.</i>	<i>Decrease impervious surfaces where possible.</i>
		<i>Increased constructed surfaces, such as dark roofing and asphalt.</i>	<i>Increased heat absorption during the day that is radiated at night, which increases heat island effect and amplifies warming temperatures of climate change.</i>	<i>Use of light-colored building materials and surfaces to reduce heat absorption. Regular maintenance and updates to infrastructures, as needed, for life of project.</i>
		<i>Increased quantity of concrete and building construction materials, and infrastructure.</i>	<i>Infrastructure more vulnerable to damage and deterioration from elevated temperatures.</i>	<i>Use of construction materials that are resilient to increasing temperatures for the life of the project.</i>
		<i>Increased traffic on Township Road 7 and County Road 24</i>	<i>Increased degradation of blacktop may occur with increased temperature, especially with a milder winter.</i>	<i>Monitor condition of roadway coordinating with local road authorities.</i>
	Average annual precipitation increasing	<i>Repeat project components for each climate trend and projection ↓</i>	<i>Discuss potential environmental effects with each project component ↓</i>	<i>List adaptation strategies for each project component ↓</i>
	Cold weather warming			

Resource Category	Climate Trends and Climate Projections	Project Components	Potential Environmental Effects	Adaptation Strategies (with applicable timeframe – construction to end of expected lifespan)
			<ul style="list-style-type: none"> Identify climate change risks & vulnerabilities. Identify long-term impacts that climate conditions pose to proposed activities. 	
	Heavier, more damaging rains			
	Increasing risk of heatwaves			
	Increasing risk of drought			
Land Use	Address in item 10	Address in item 10	Address in item 10	Address in item 10
Water Resources	Address in item 12	Address in item 12	Address in item 12	Address in item 12
Contamination/ Hazardous Materials/Wastes	Address in item 13	Address in item 13	Address in item 13	Address in item 13
Fish, wildlife, plant communities, and sensitive ecological resources (rare features)	Address in item 14	Address in item 14	Address in item 14	Address in item 14

Resource category: land use

In EAW Item 10 Land Use, discuss the compatibility of the project activities with the current land use, proposed land use, and zoning, as it relates to the projected climate changes for the project location, described in EAW item 7b.

- **Current and Proposed Land Use:** Describe the existing and proposed human use of the land, representing the economic and cultural activities (e.g., agricultural, residential, industrial, mining, and recreational uses).
- **Planned Land Use:** As determined by Comprehensive Plan, Watershed Plan, and any other applicable plan for land use, water, or resource management by a local, regional, state, or federal agency.
- **Zoning:** As determined by special district overlay such as shoreland or floodplain, and the local zoning designation.

Actions or features to consider that may amplify or interact with how climate change is anticipated to affect land use include reduction or loss in tree cover, increased heat and longer growing seasons, cropland productivity is increased/reduced, prolonged groundwater rise, and prolonged drought.

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