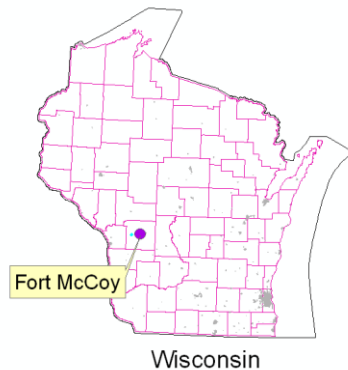


Case Study: Fort McCoy and Low Impact Development L-THIA

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The cantonment areas of military installations can be much like a small city, composed of urbanized areas with large connected impervious surfaces. This case study reflects on a project performed at Fort McCoy, Wisconsin. From its modest beginnings when it was known as the Sparta Maneuver Tract to the ever-modernizing, premier training facility that it is today, Fort McCoy, Wisconsin has been a training resource to our nation's civilian and military leaders for over 100 years. The Fort McCoy landscape is still dominated by the white wooden buildings with red roofs constructed during World War II. But over time, that image will change as Fort McCoy transforms. The base is a constantly renewing installation that provides superior training for service members of all branches.



As per Section 438 of the Energy Independence and Security Act (EISA), it was deemed necessary that new developments at the Fort McCoy military installation implement low-impact development practices to protect the area hydrology. The US Environmental Protection Agency (EPA) developed guidance in 2009 to comply with the EISA which outlined an approach to implementing the rule. In addition, the cantonment area is placed over several cold water streams and wetland areas, and protection of these natural resources was of particular interest. These streams, part of the greater Sparta River watershed, formed several subwatersheds over the 3000-acre cantonment area.

L-THIA was developed as an analysis tool to evaluate the long term effects or impacts of land use change on direct runoff and nonpoint source pollution loading. Since its introduction in 1994, L-THIA has evolved into a Web-based model which employs the curve number (CN) method and Event Mean Concentration (EMC) coefficients to estimate direct surface runoff and nonpoint source (NPS) pollutant loads. The CN, determined by the combination of land use and hydrologic soil group, is widely used for simulating runoff. NPS pollutant loads are predicted in L-THIA by multiplying estimated runoff volume by the EMC value for each pollutant for each land use type.

Recently L-THIA has been extended to employ Low-Impact Development (LID) practice in the analysis. Low-Impact Development refers to an approach to land development or planning which is intended to mimic the pre-development site hydrology. The goal of this analysis is to generate a suite of practices which would then be available for integration into Fort McCoy master planning.

This LID analysis includes designing a landuse plan which will:

- 1) Reduce volume of runoff
- 2) Decentralize runoff, diffusing flows into smaller retention/detention areas
- 3) Improve water quality
- 4) Encourage groundwater infiltration

The technical team was comprised of two Purdue University students, a professor, and technical staff at the EPA and Fort McCoy.

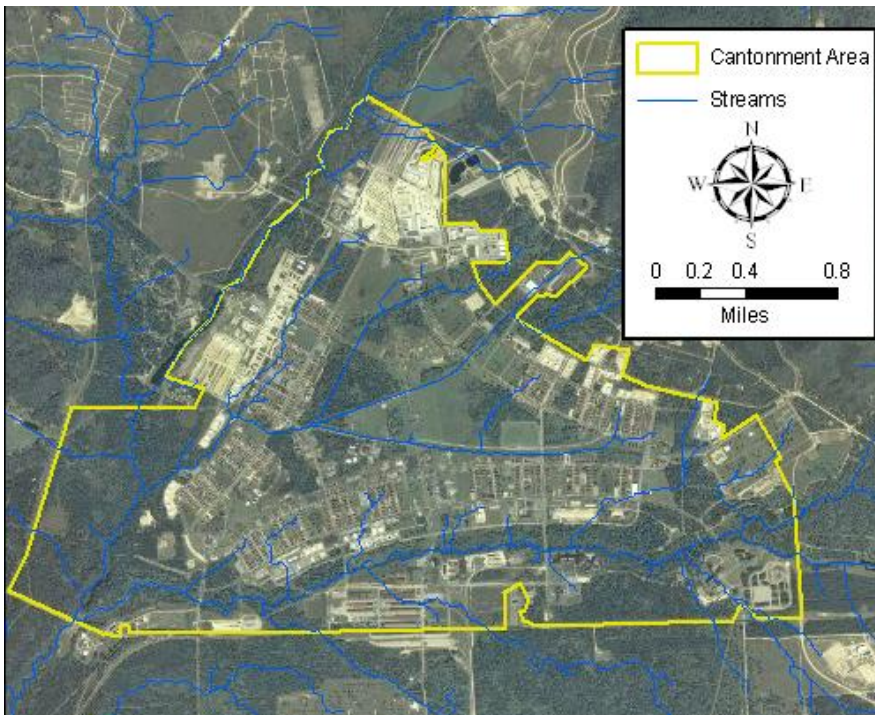


Figure 1 Cantonment Area, Fort McCoy, Wisconsin

Prior to running the L-THIA LID model, the team created GIS layers of the current and future base development plans in ArcGIS.

The team was able to utilize L-THIA land use designations, classify the areas of concern, and determine runoff water quantity and quality for evaluation.

Following this evaluation, the L-THIA LID toolset was used as a guide for the selection of low-impact development practices to meet the needs of Fort McCoy and requirements of Section 438:

The project results is a conceptual design utilizing LID practices that will

- Reduce imperviousness
- Conserve infiltratable soils
- Conserve functional / sensitive landscape
- Minimize land disturbances
- Anticipate need for other LID practices to reduce NPS and stormwater volume
- Recognize needs of troops including recreational and aesthetic values