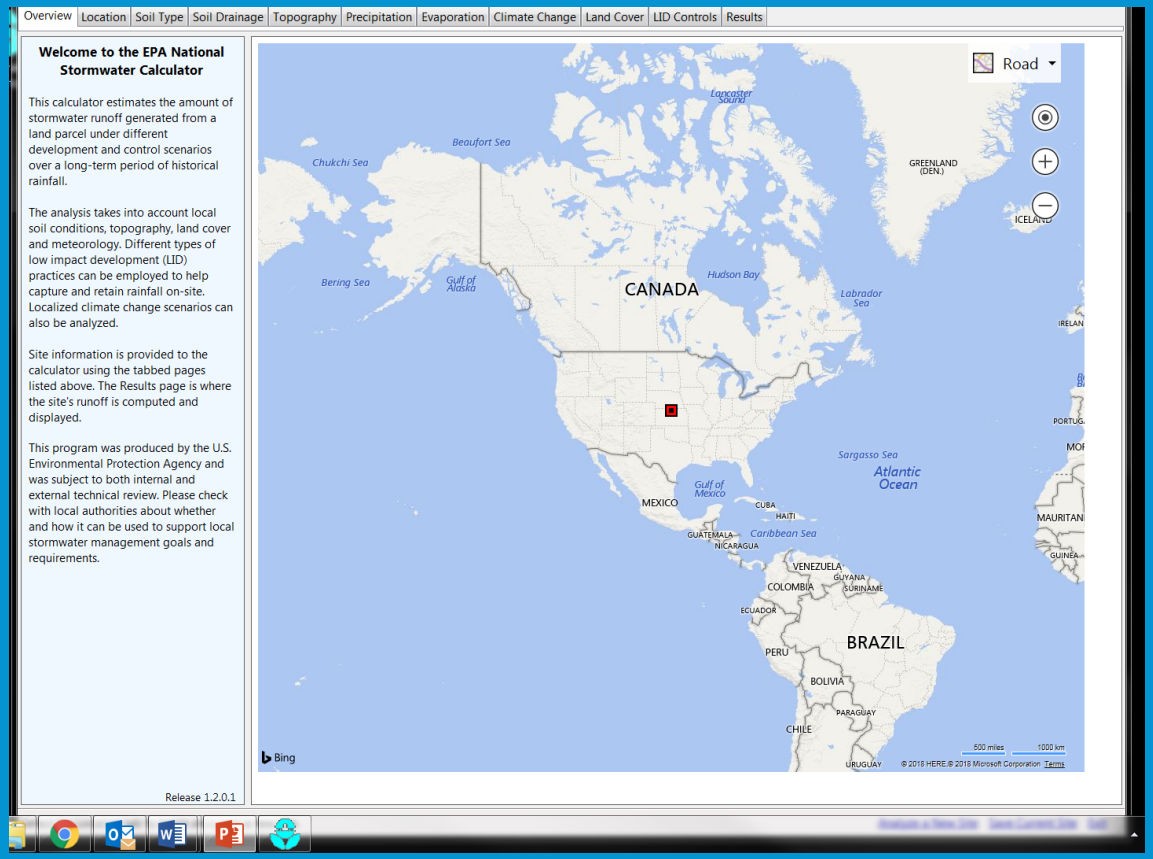
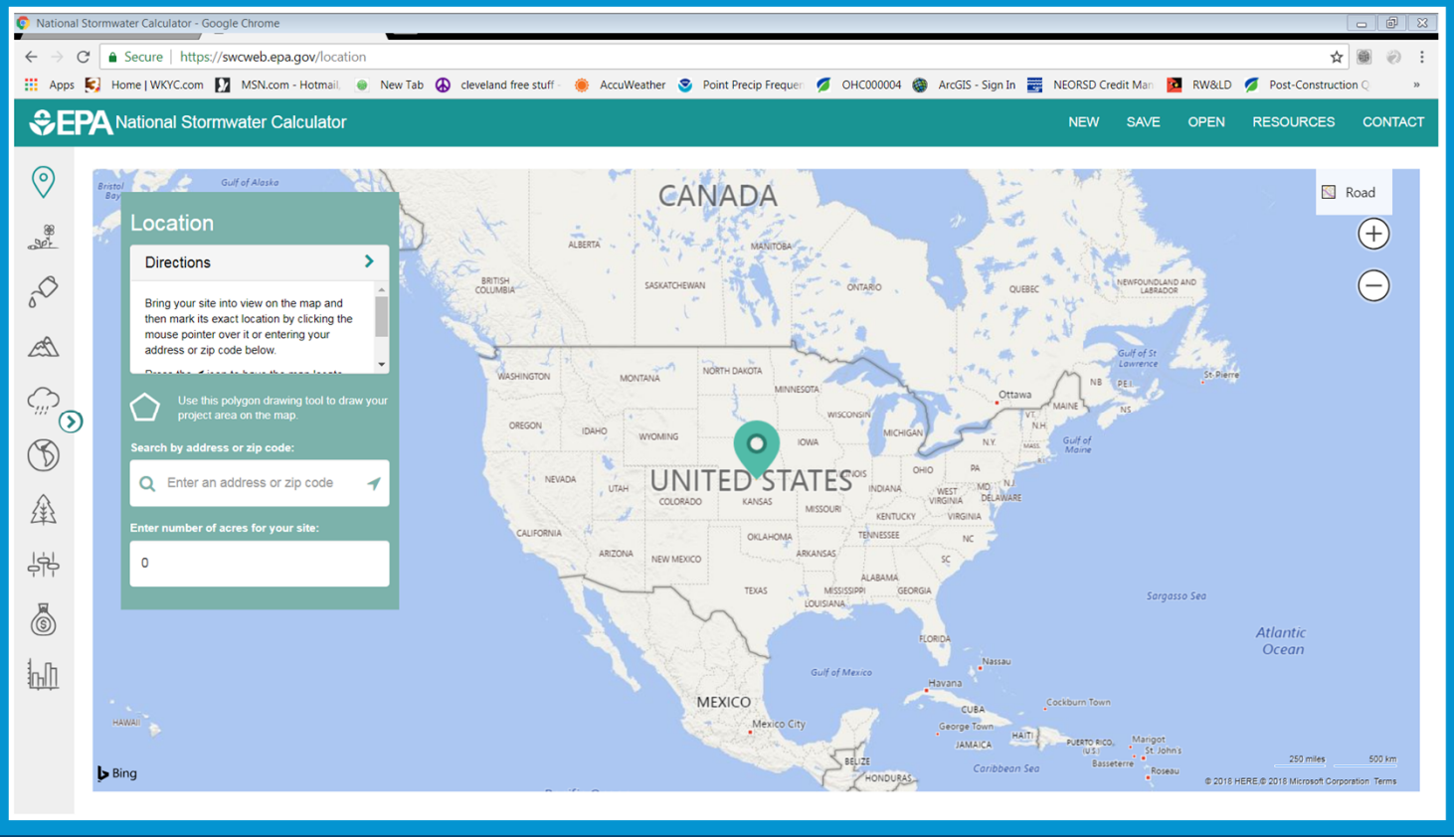
GI Grant Program Technical Requirements

EPA National Stormwater Calculator



GI Grant Program Technical Requirements

EPA National Stormwater Calculator

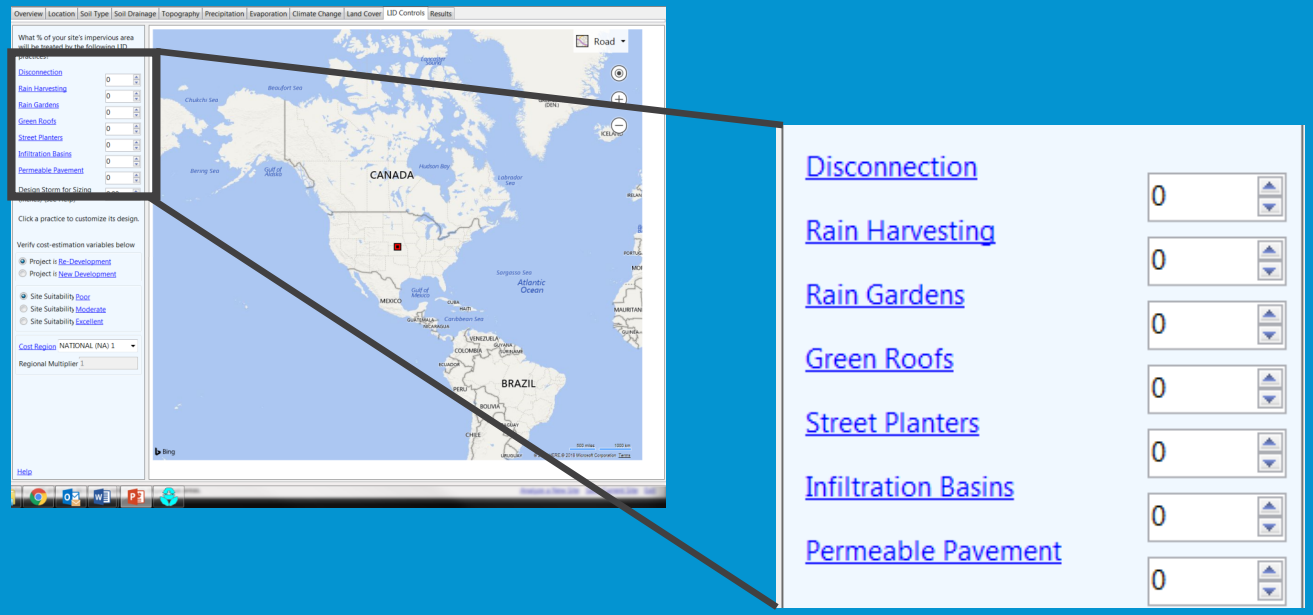


GI Grant Program Technical Requirements

EPA National Stormwater Calculator
Low Impact Development (LID) Control

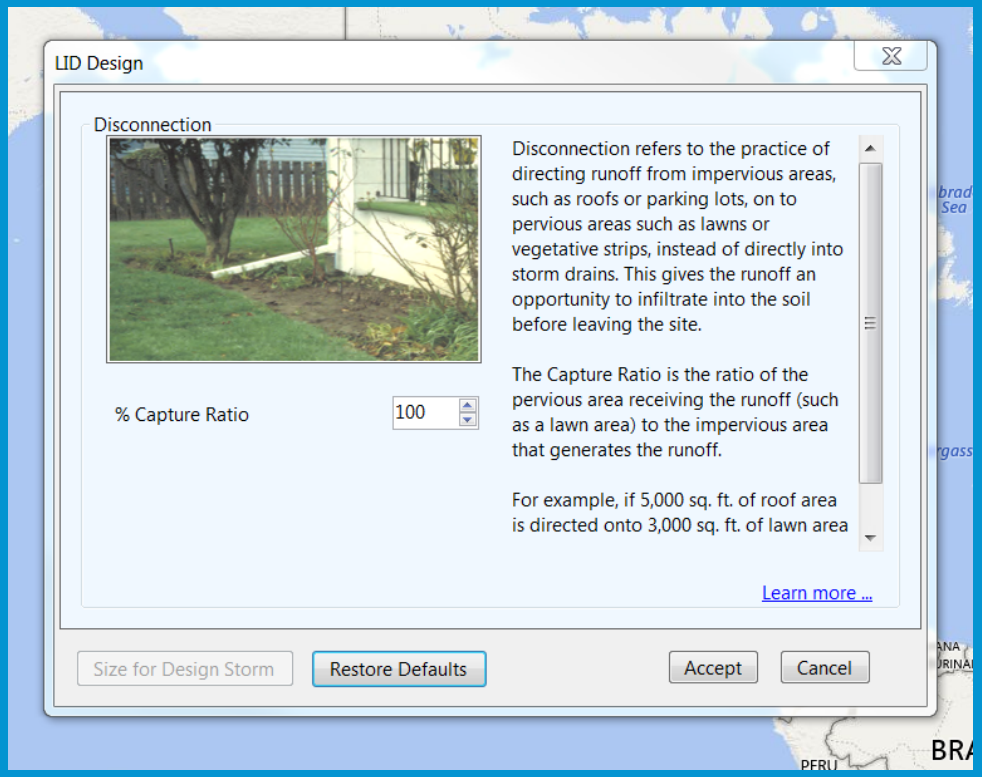
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Low Impact Development (LID) Control



GI Grant Program Technical Requirements

EPA National Stormwater Calculator LID Control - Disconnection

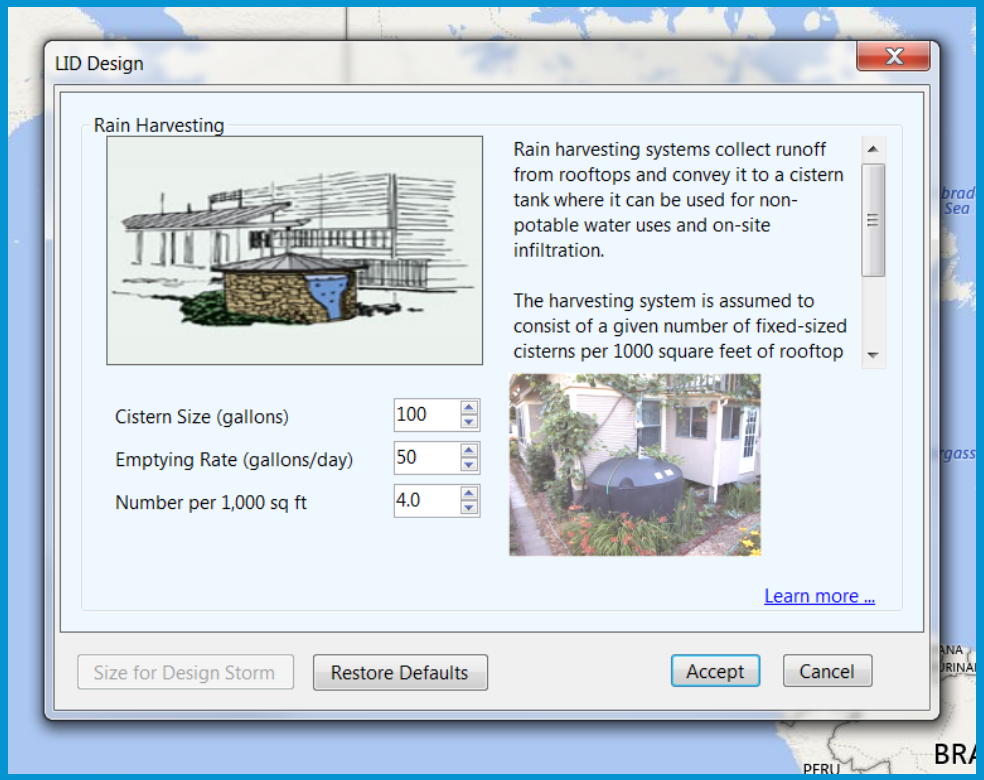


The Capture Ratio is the ratio of the pervious area receiving the runoff (such as a lawn area) to the impervious area that generates the runoff.

For example, if 5,000 sq. ft. of roof area is directed onto 3,000 sq. ft. of lawn area then the Capture Ratio would be 3,000 / 5,000 or 60%.

GI Grant Program Technical Requirements

EPA National Stormwater Calculator LID Control – Rain Harvesting

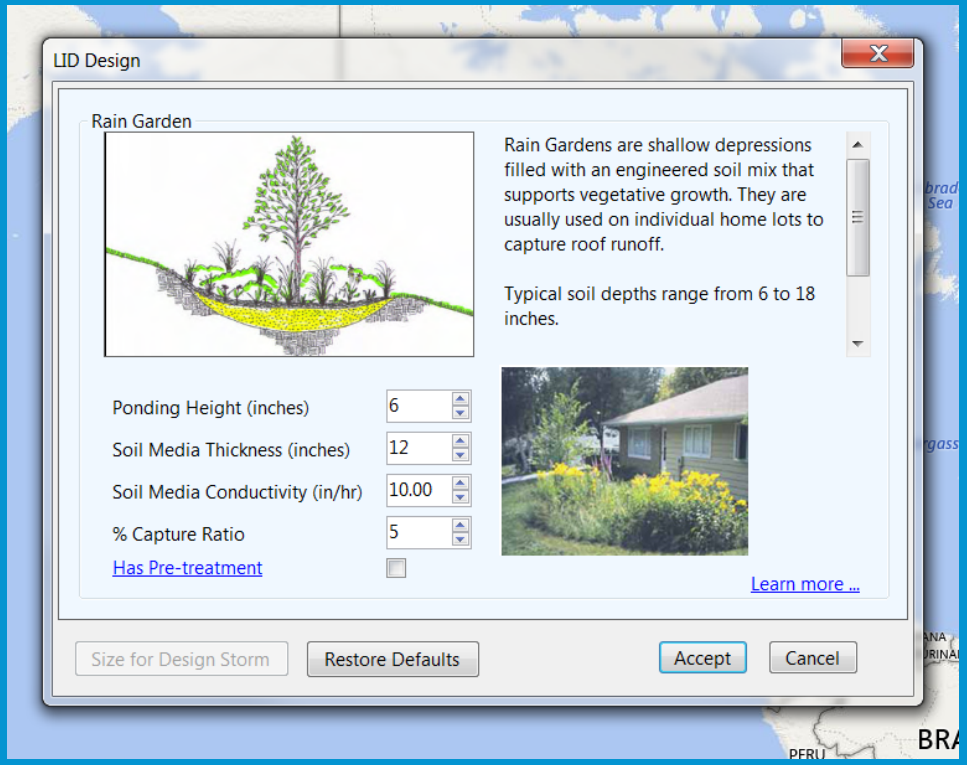


The harvesting system is assumed to consist of a given number of fixed-sized cisterns per 1,000 square feet of rooftop area captured.

The water from each cistern is withdrawn at a constant rate and is assumed to be consumed or infiltrated entirely on-site.

GI Grant Program Technical Requirements

EPA National Stormwater Calculator LID Control – Rain Garden

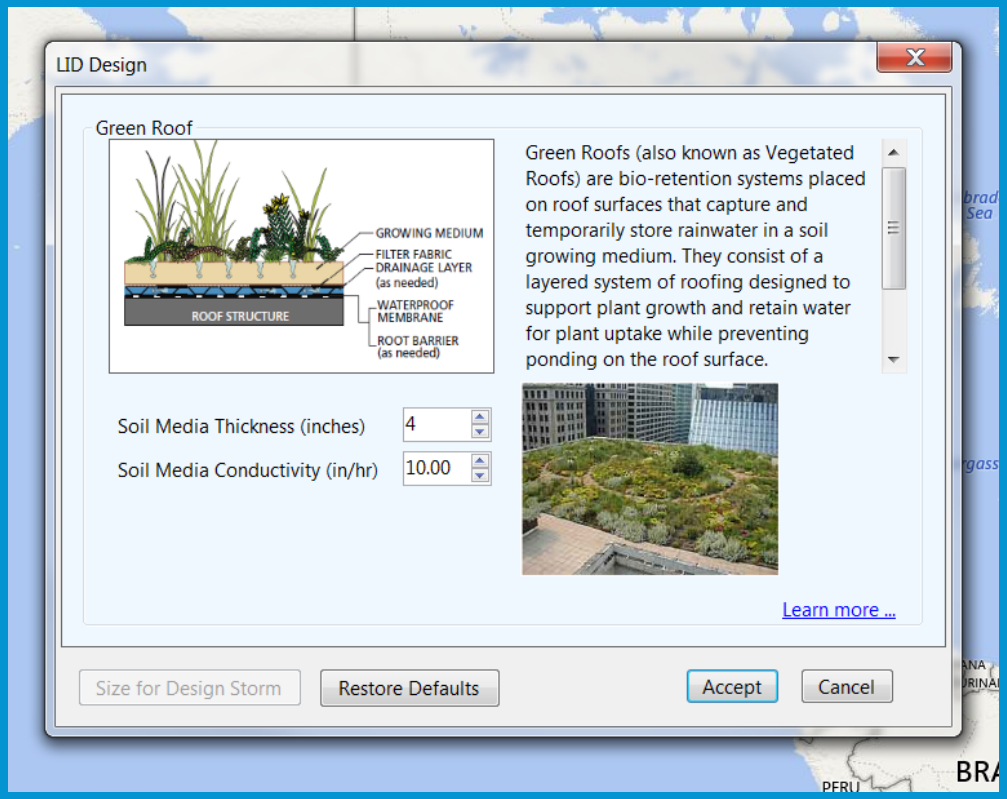


The Capture Ratio is the ratio of the rain garden's area to the impervious area that drains onto it.

For example, if 1,000 sq. ft. of roof area is directed onto 300 sq. ft. of rain garden area then the Capture Ratio would be 300 / 1,000 or 30%.

GI Grant Program Technical Requirements

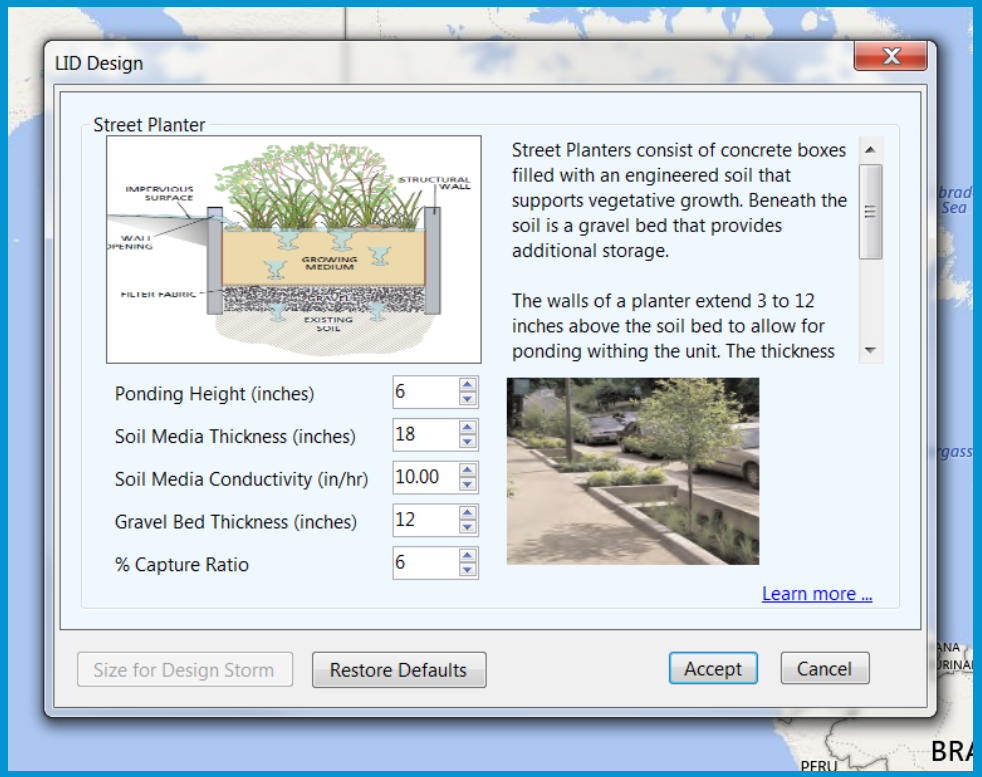
EPA National Stormwater Calculator LID Control – Green Roof



The thickness used for the growing medium typically ranges from 3 to 6 inches.

GI Grant Program Technical Requirements

EPA National Stormwater Calculator LID Control – Street Planter

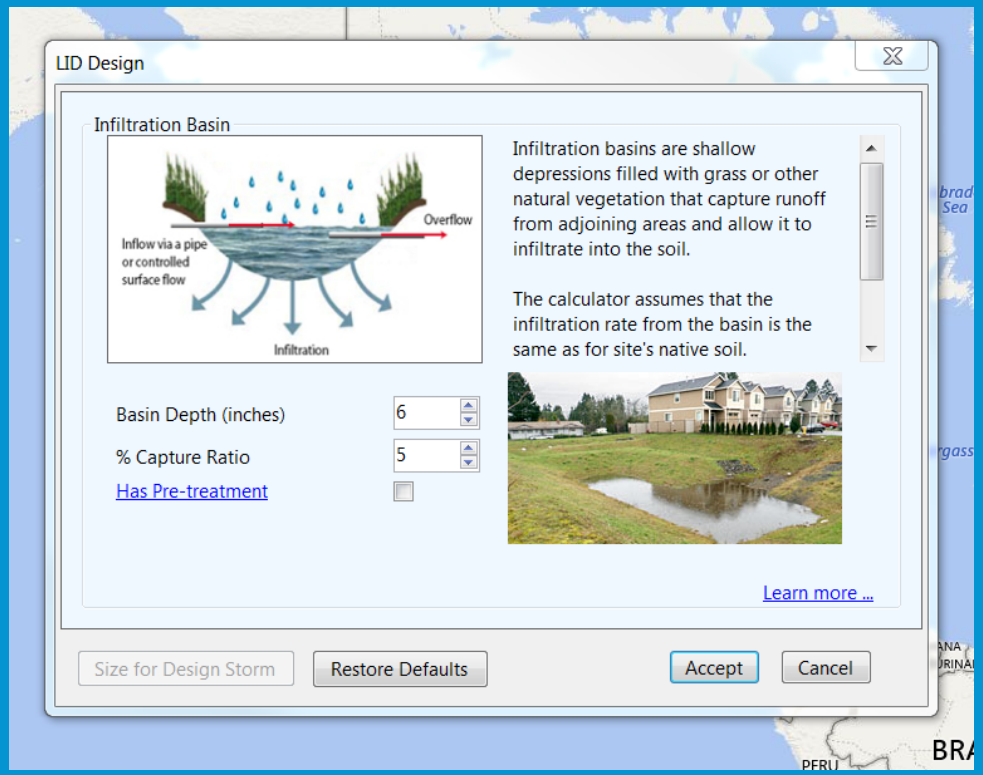


The walls of a planter extend 3 to 12 inches above the soil bed to allow for ponding within the unit. The thickness of the soil growing medium ranges from 6 to 24 inches while gravel beds are 6 to 18 inches in depth.

The planter's Capture Ratio is the ratio of its area to the impervious area whose runoff it captures.

GI Grant Program Technical Requirements

EPA National Stormwater Calculator LID Control – Infiltration Basin

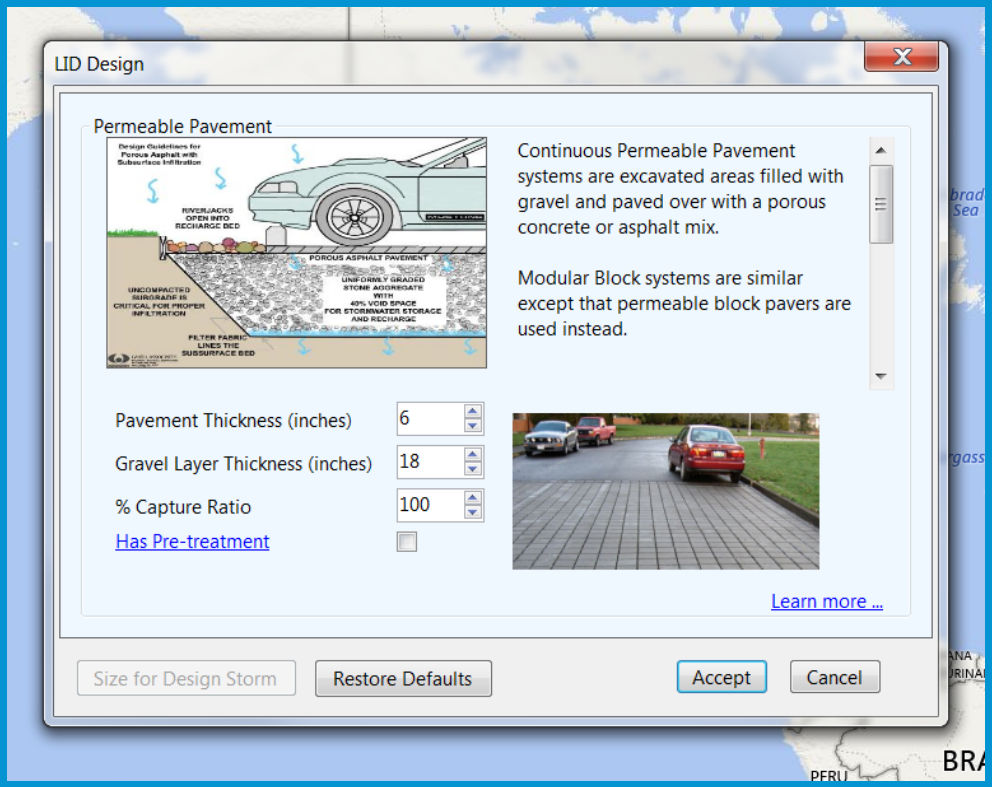


The basin's Capture Ratio is the area of the basin relative to the impervious area whose runoff it captures.

For example, if 50,000 sq. ft. of roof area is directed into 5,000 sq. ft. of infiltration basin area then the Capture Ratio would be 5,000 / 50,000 or 10%.

GI Grant Program Technical Requirements

EPA National Stormwater Calculator LID Control – Permeable Pavement



Normally all rainfall will immediately pass through the pavement into the gravel storage layer below it where it can infiltrate at natural rates into the site's native soil.

Pavement layers are usually 4 to 6 inches in height while the gravel storage layer is typically 6 to 18 inches high.

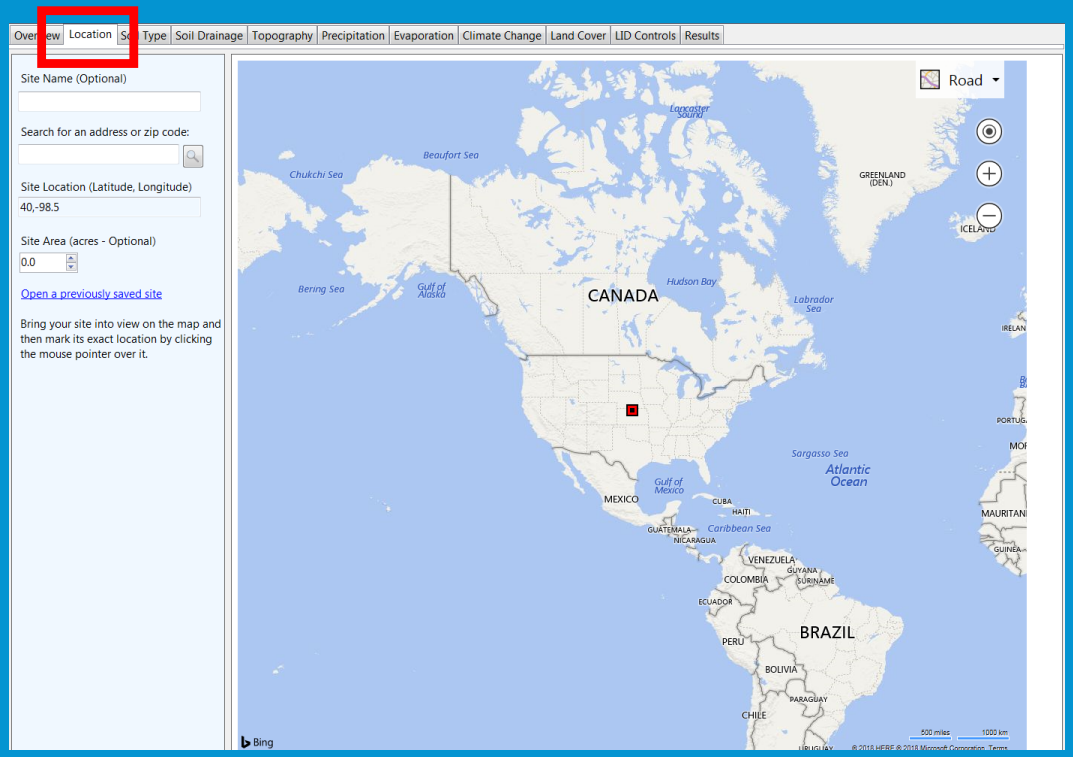
The Capture Ratio is the percent of the treated area (street or parking lot) that is replaced with permeable pavement.

GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules

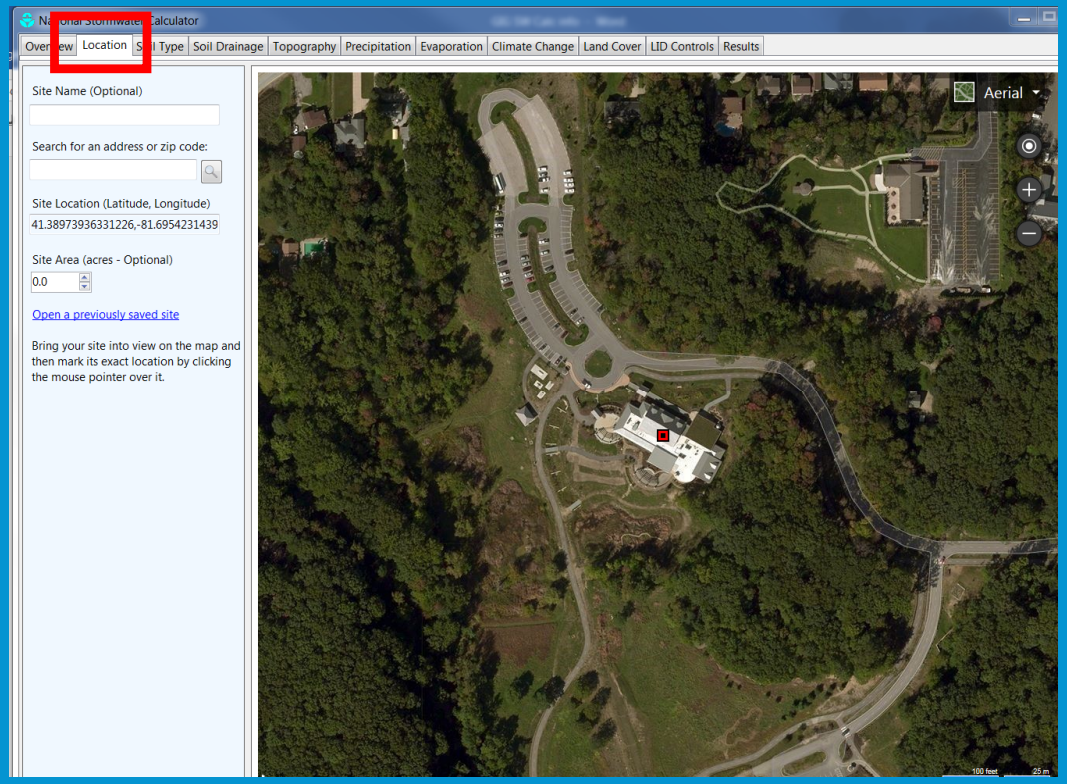
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Location



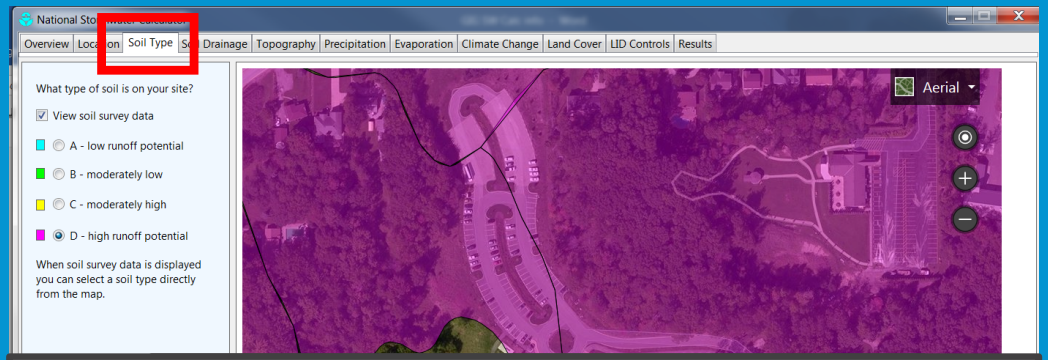
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Location



GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Soil Type

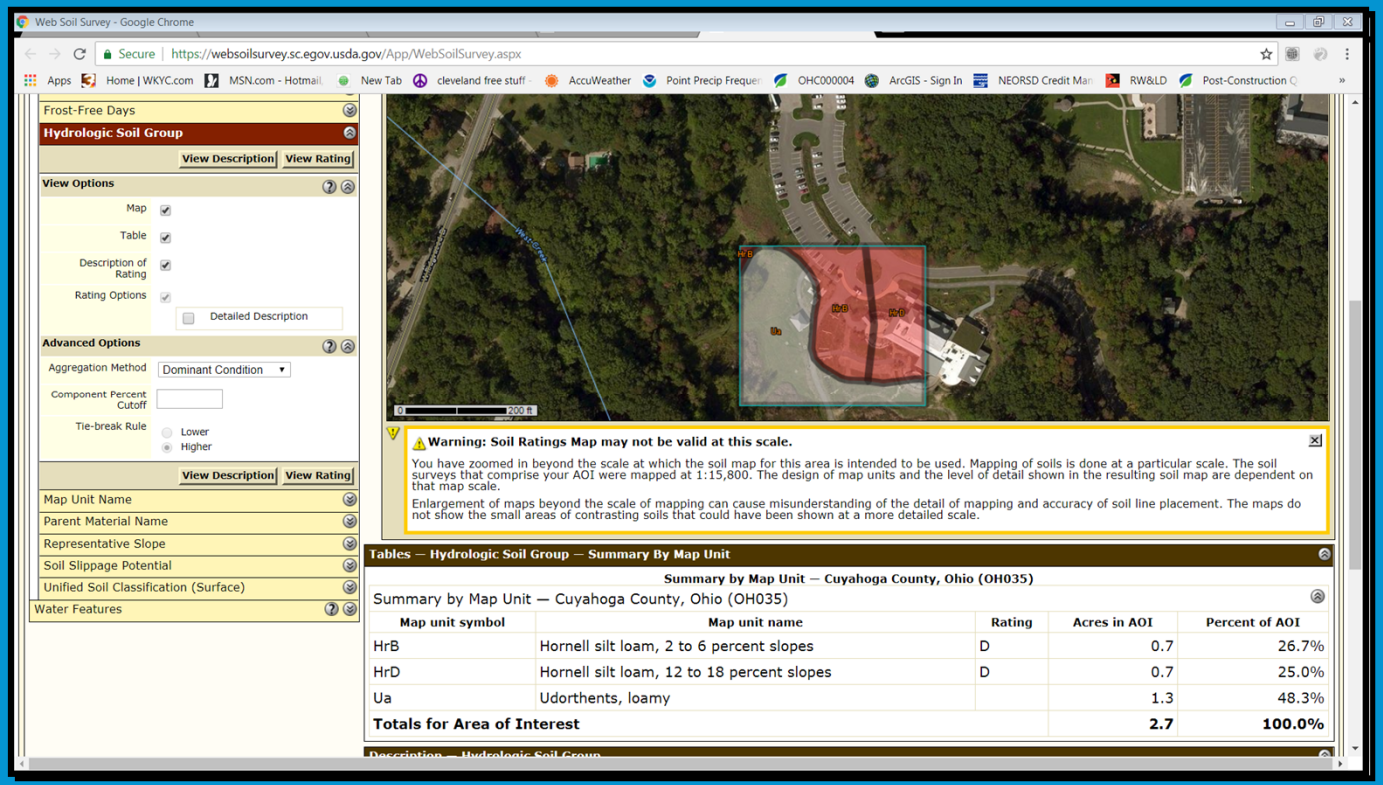


Hydrologic Soil Group Default Values for Runoff Potential

A – Sand (low runoff/high infiltration)
B – Sandy Loam (moderately low runoff)
C – Clay Loam (moderately high runoff)
D – Clay (high runoff/low infiltration)

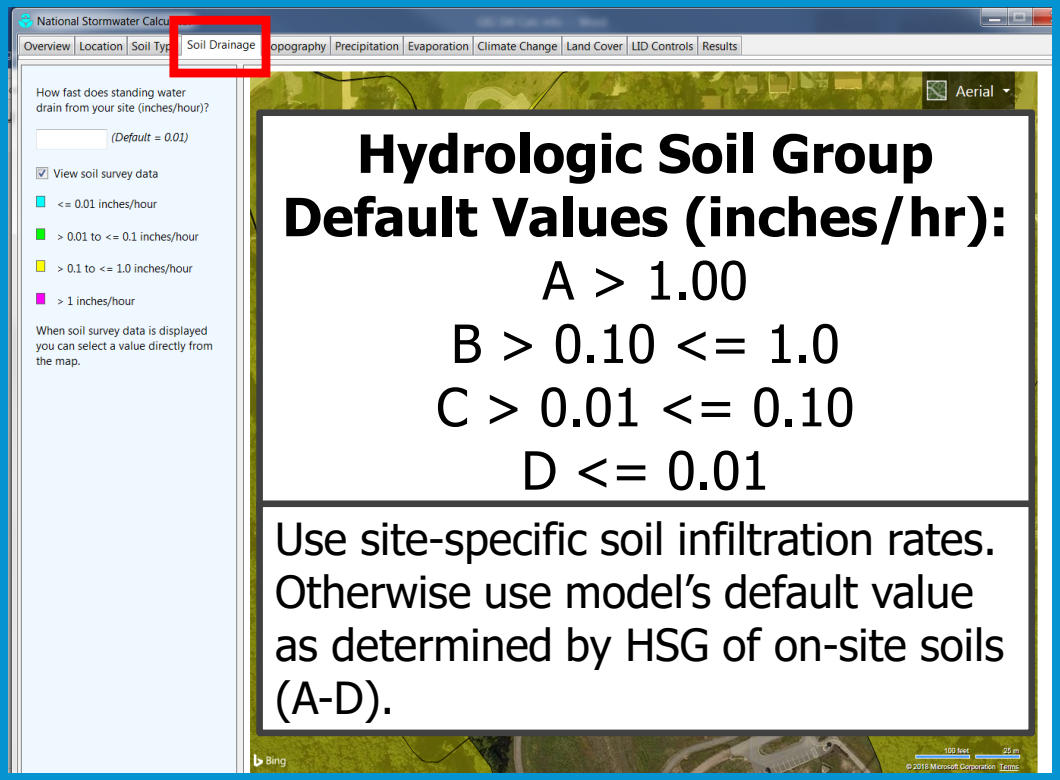
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Soil Type



GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Soil Drainage



GI Grant Program Technical Requirements

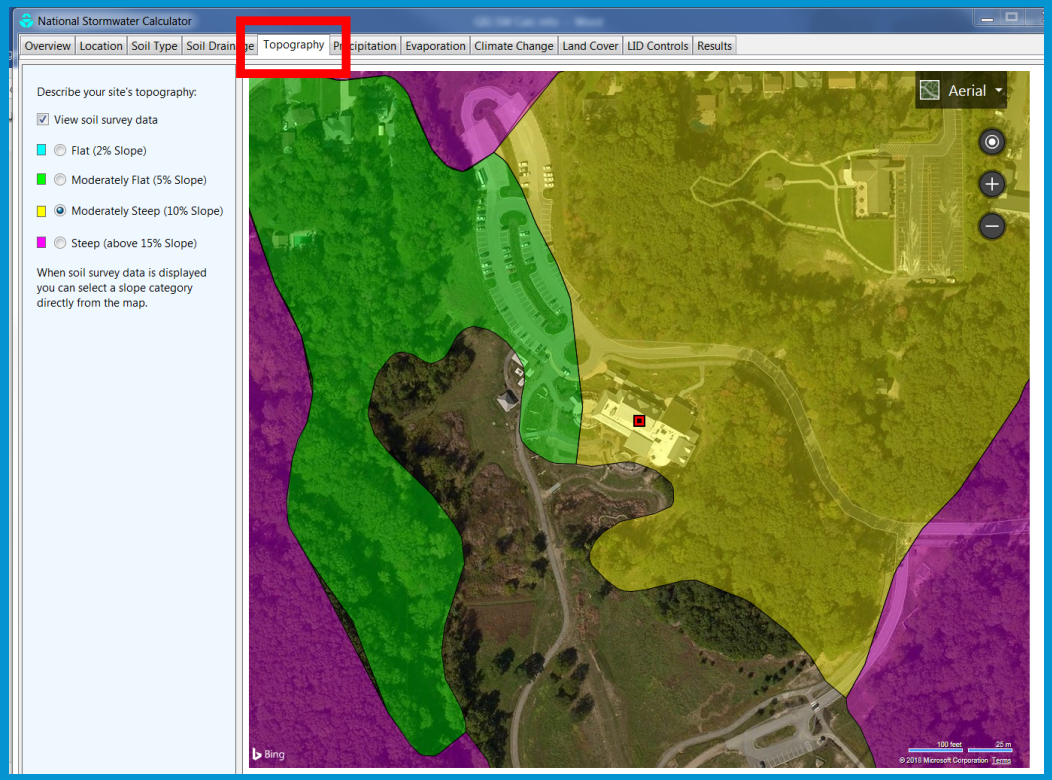
EPA National Stormwater Calculator Modules – Infiltration Testing

Use site-specific soil infiltration rates. Otherwise use model's default value as determined by HSG of on-site soils (A-D).

- ENSURE INFILTRATING SCMS PROPOSED TO MEET AND/OR EXCEED TITLE IV REQUIREMENTS ARE DESIGNED PER THE RESULTS OF ON-SITE SUBGRADE INFILTRATION TESTING USING APPROVED METHODS FROM THE FOLLOWING SOURCES:
  - Ohio Rainwater and Land Development Manual
  - Other state stormwater management manuals as recognized by the District
  - The District can consider designs that deviate from current standards on a case-by-case basis.

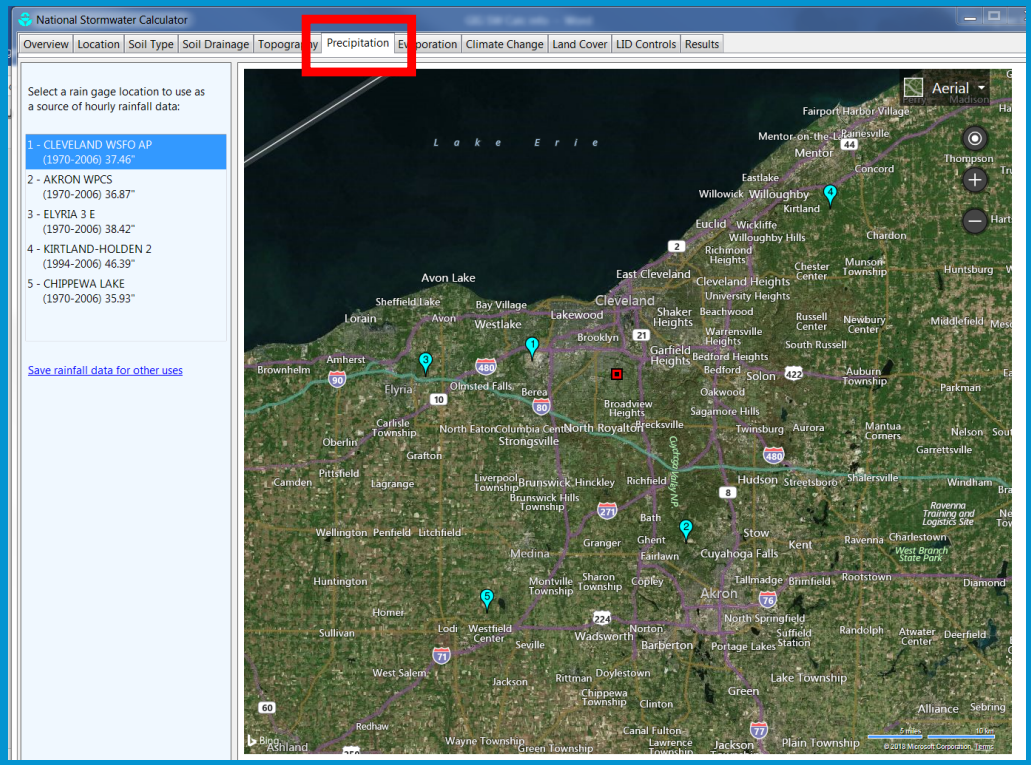
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Topography



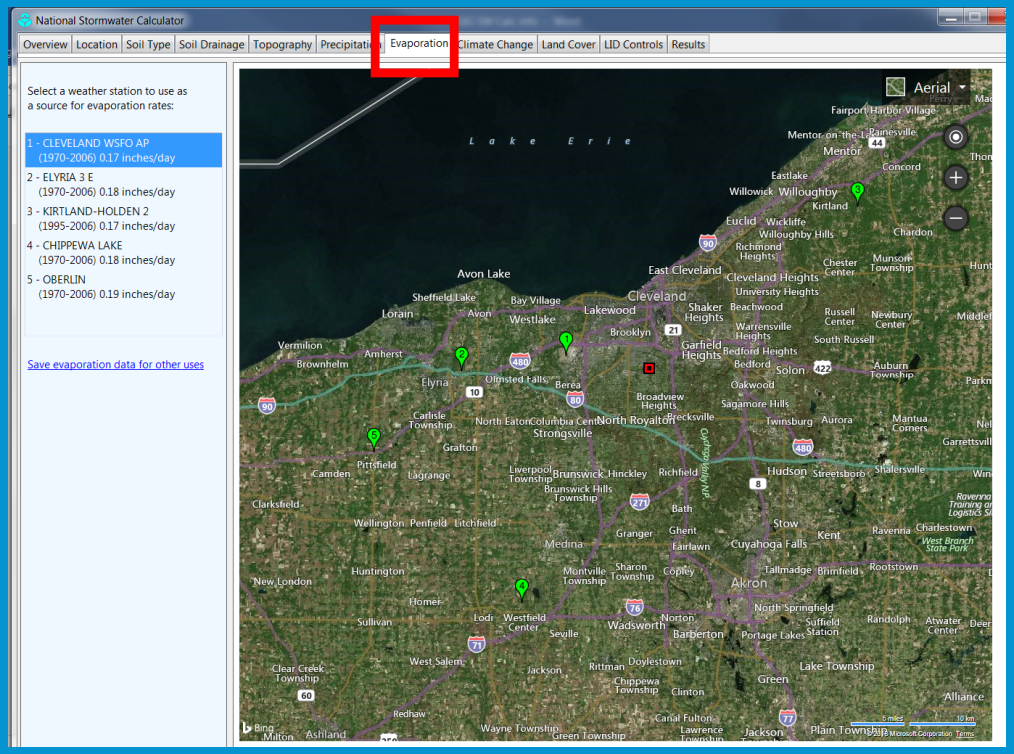
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Precipitation



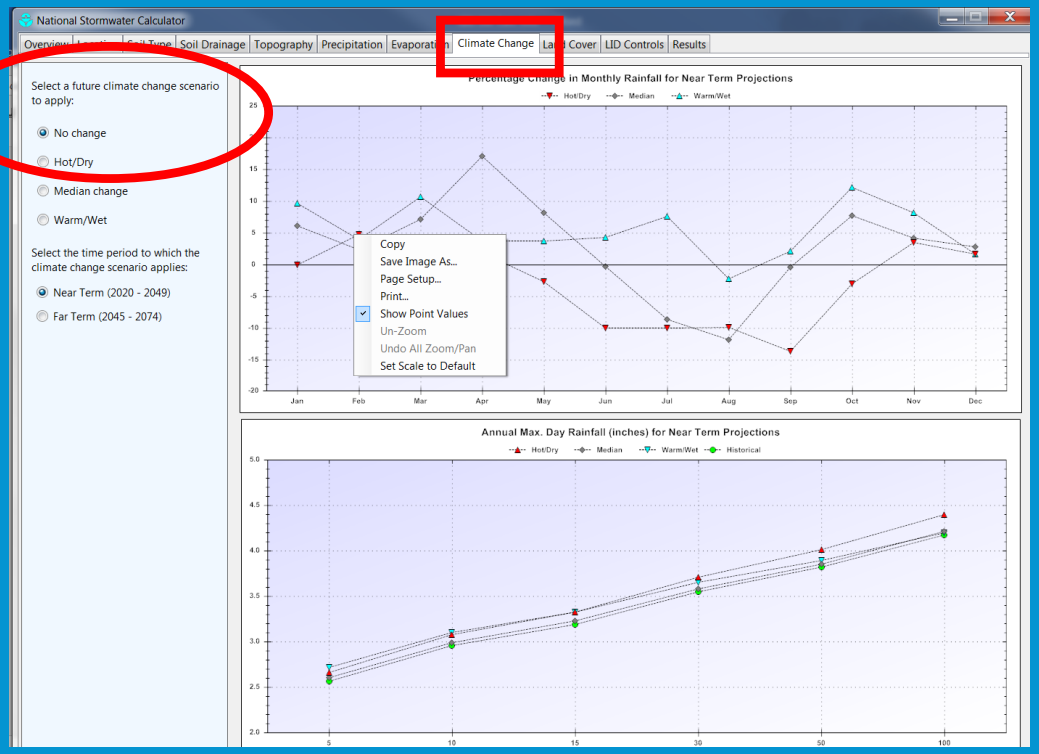
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Evaporation



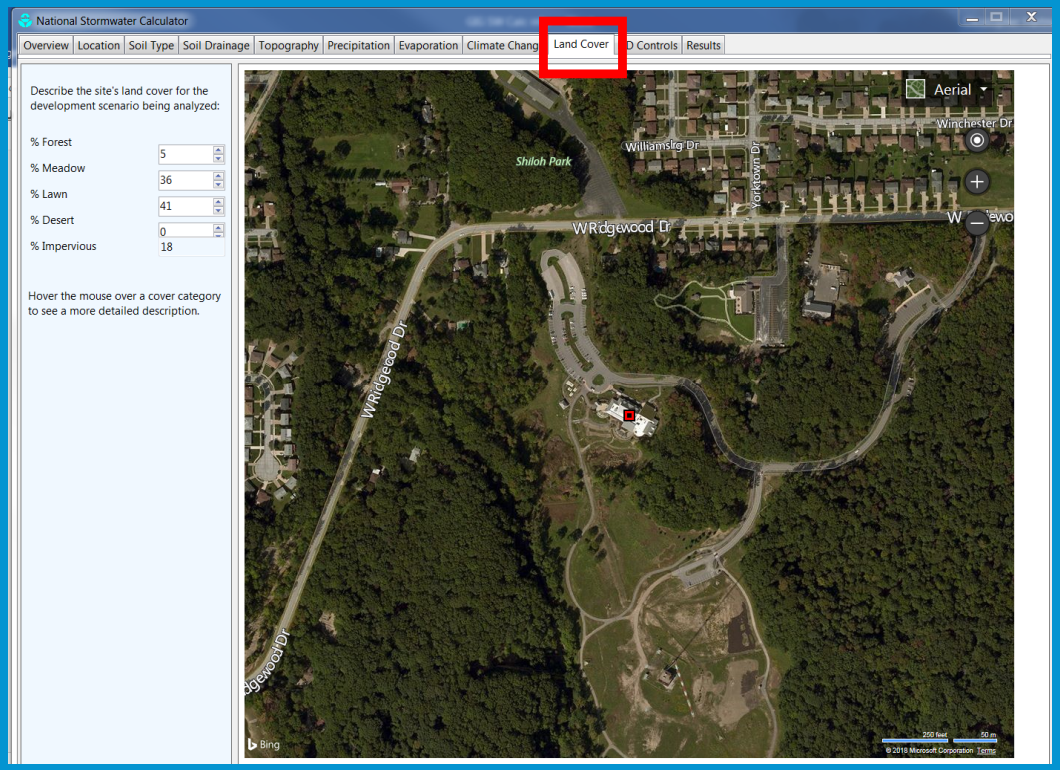
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Climate Change



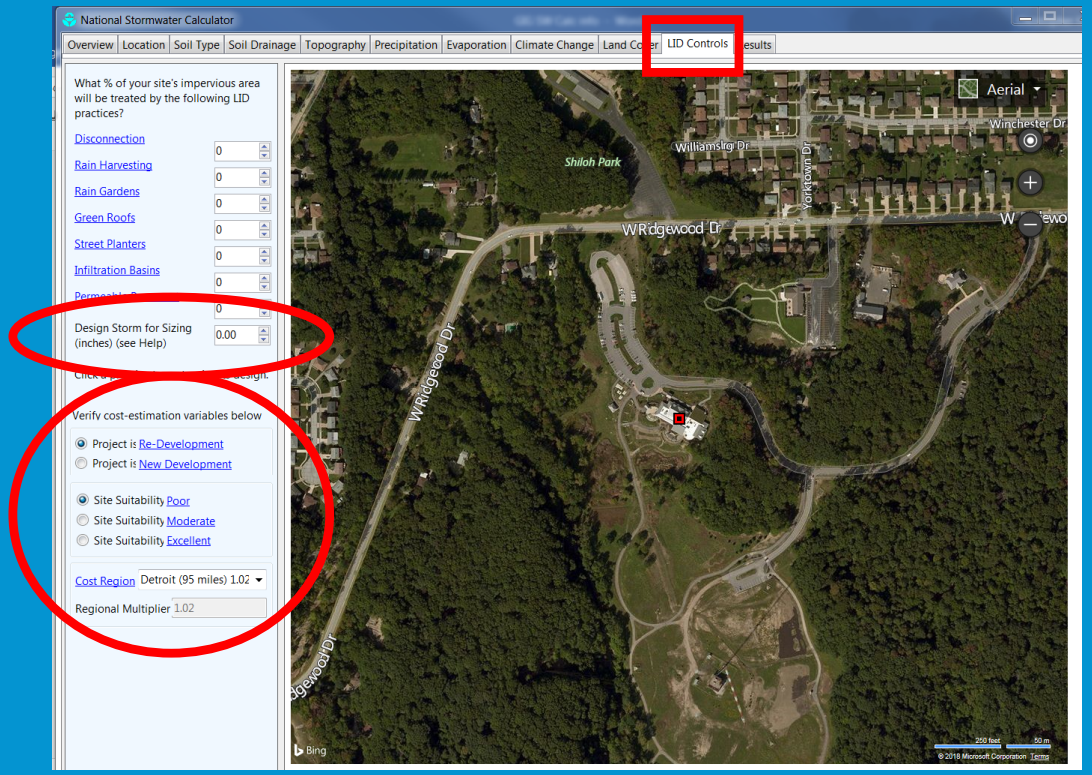
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Land Cover



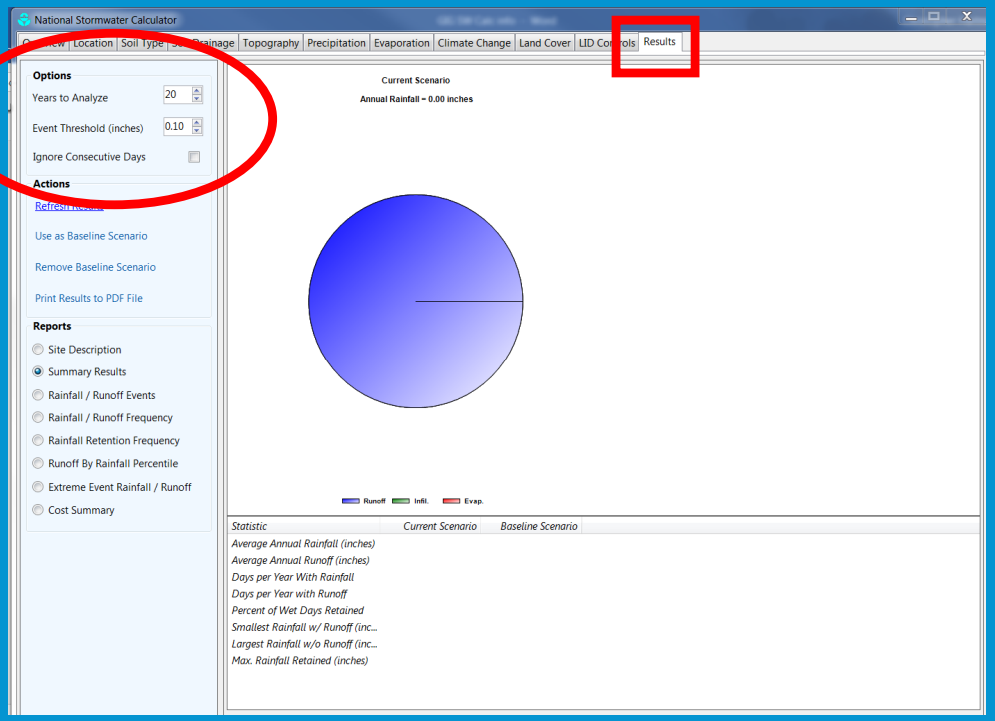
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – LID Controls



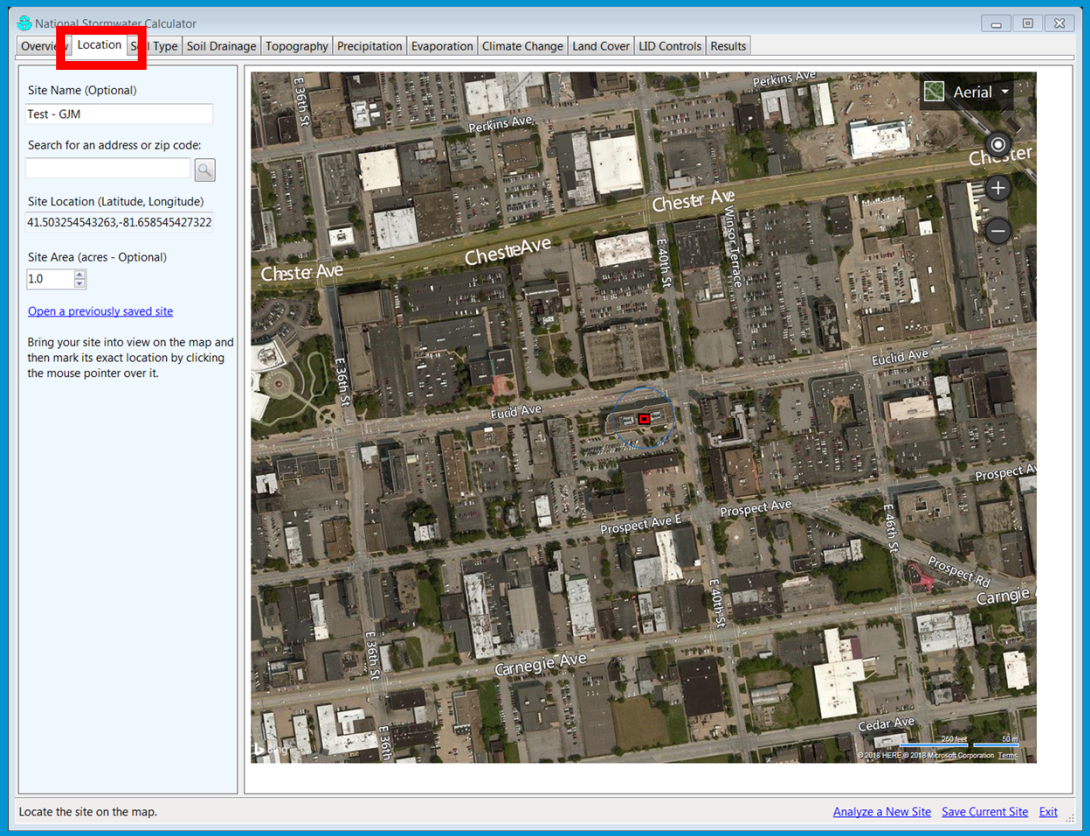
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Results



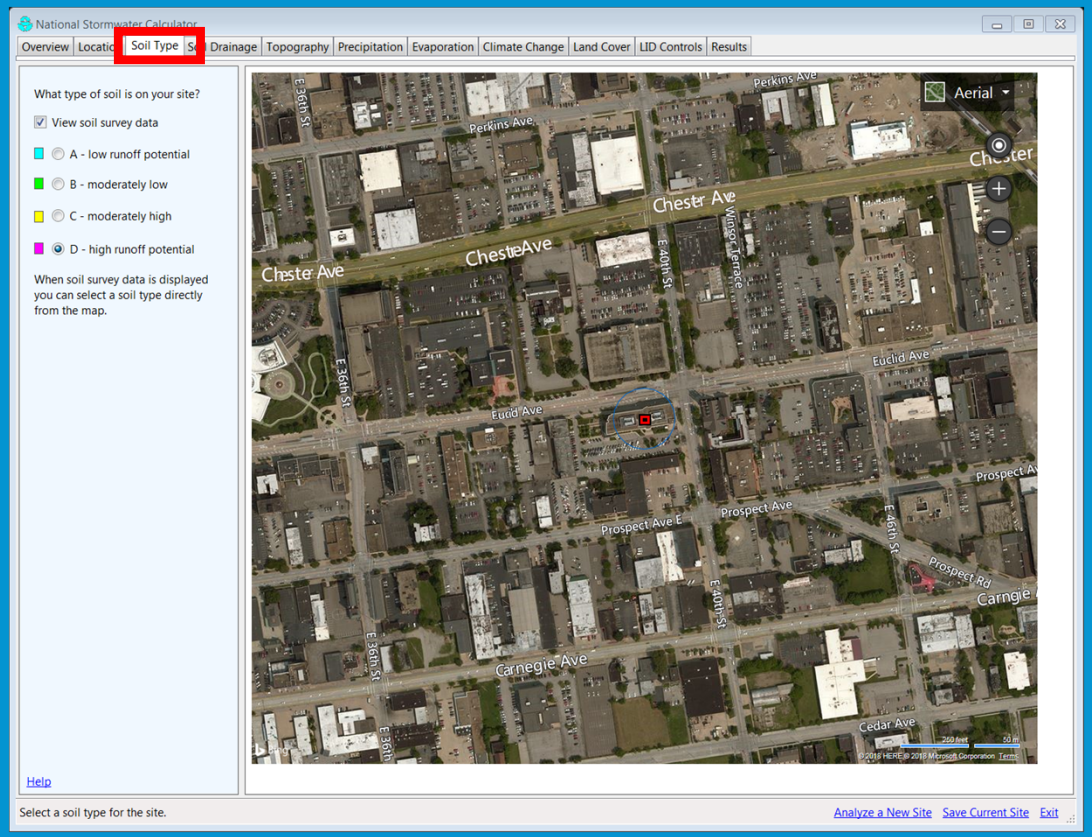
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Existing Conditions



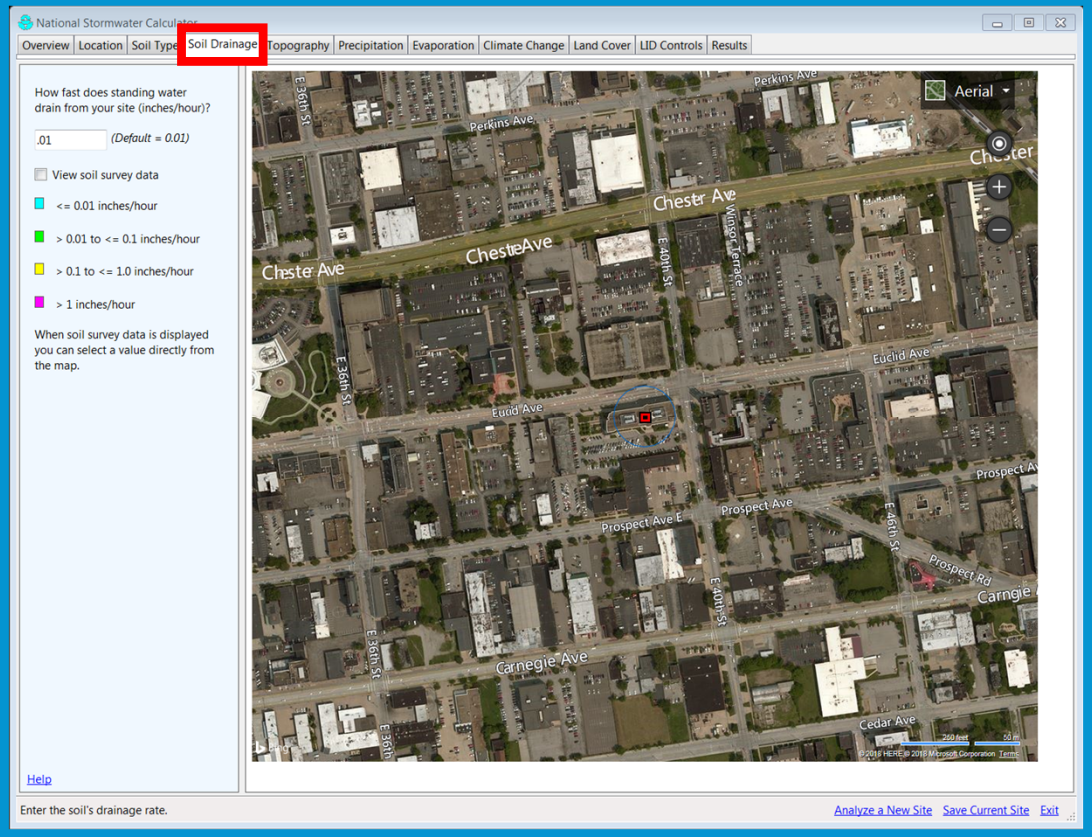
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Existing Conditions



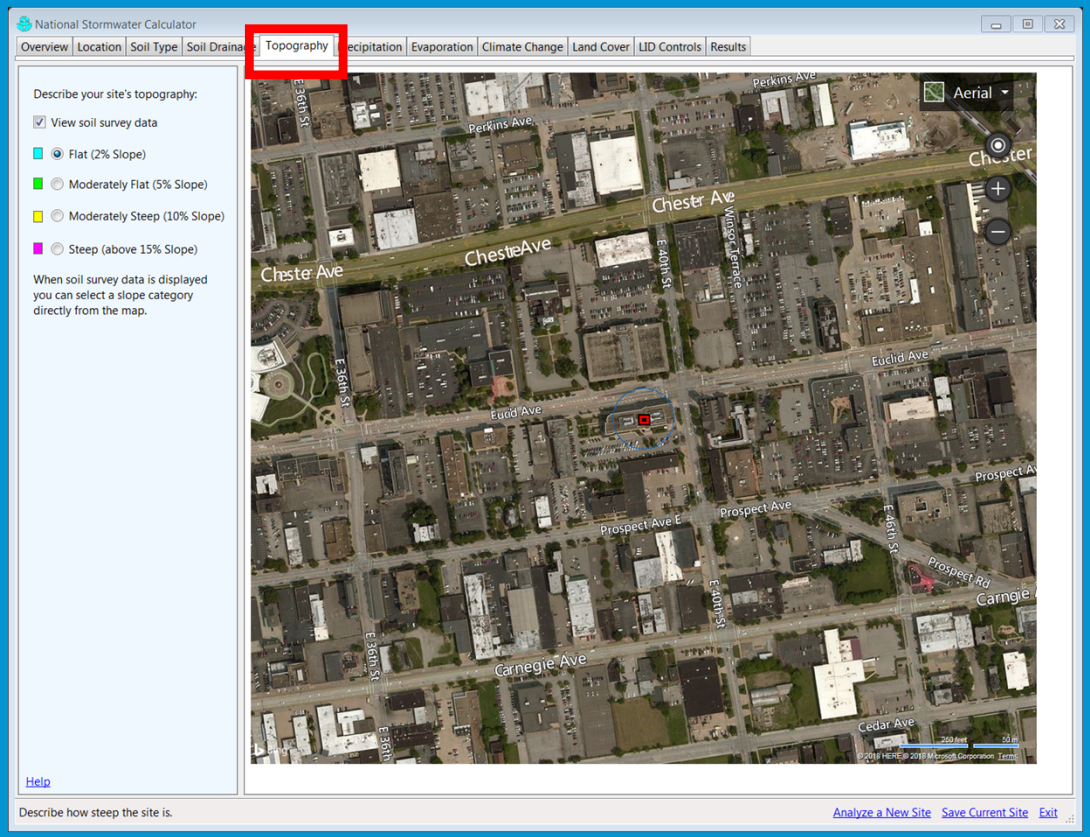
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Existing Conditions



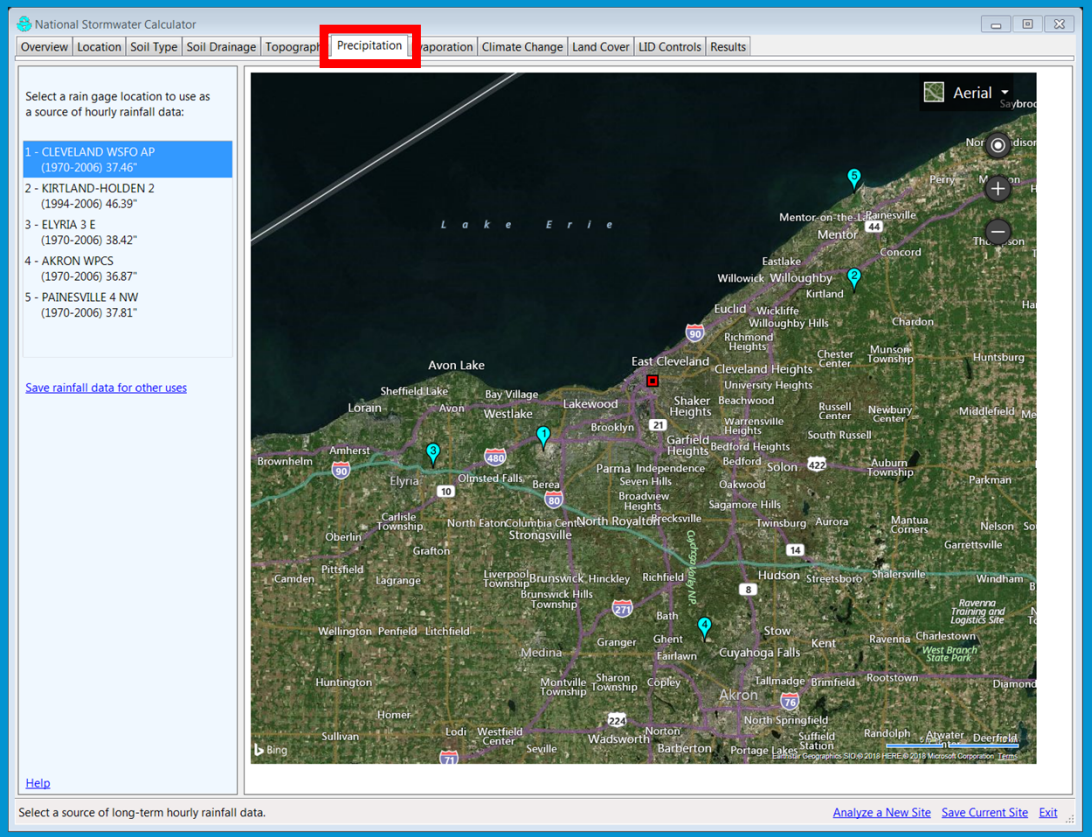
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Existing Conditions



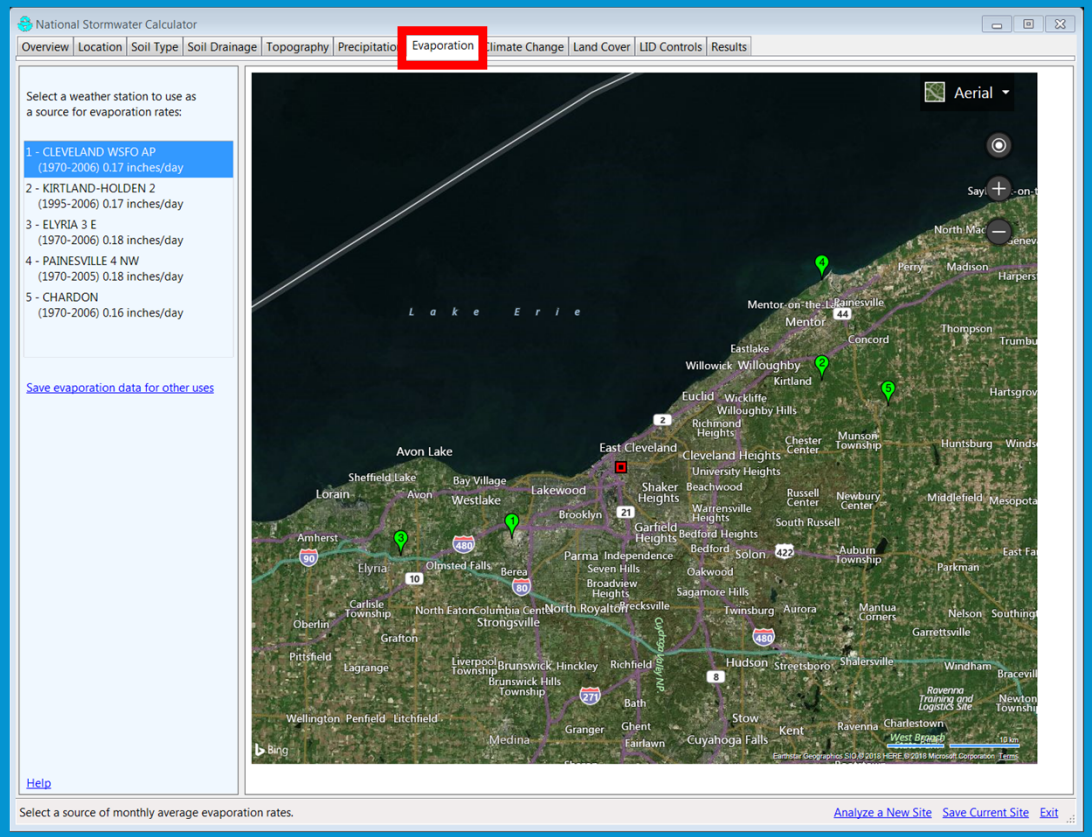
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Existing Conditions



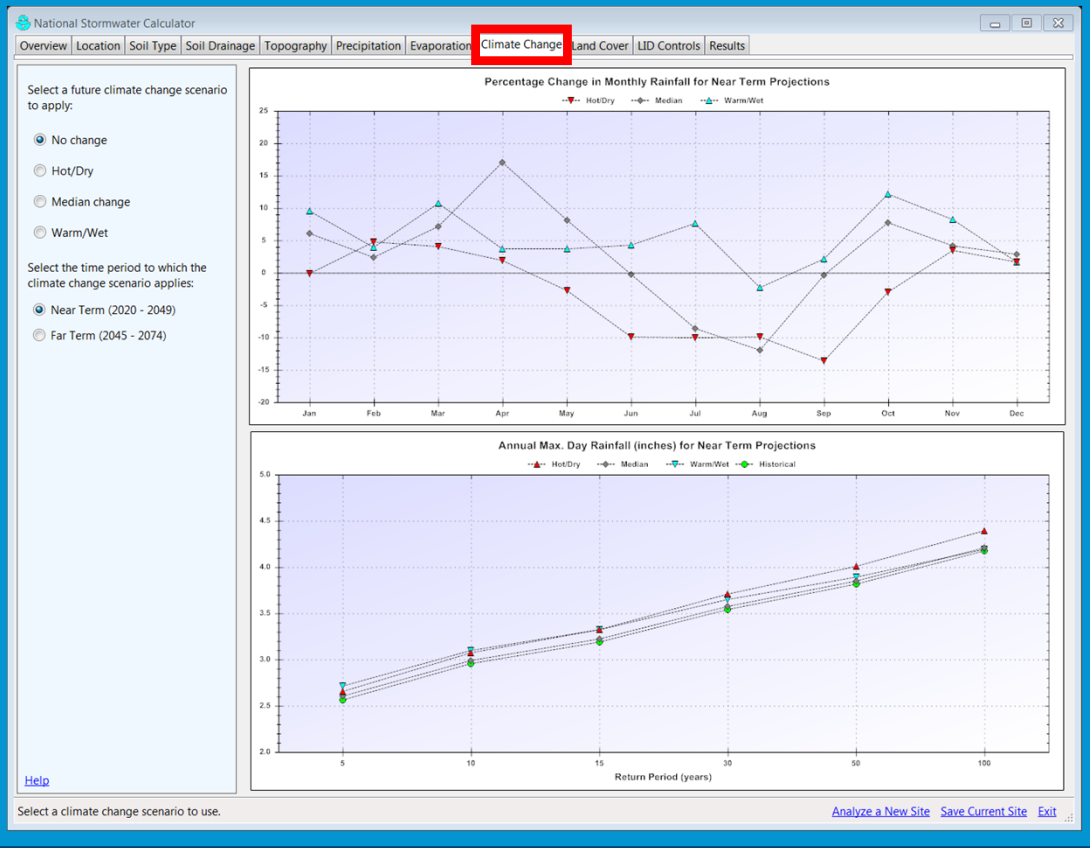
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Existing Conditions



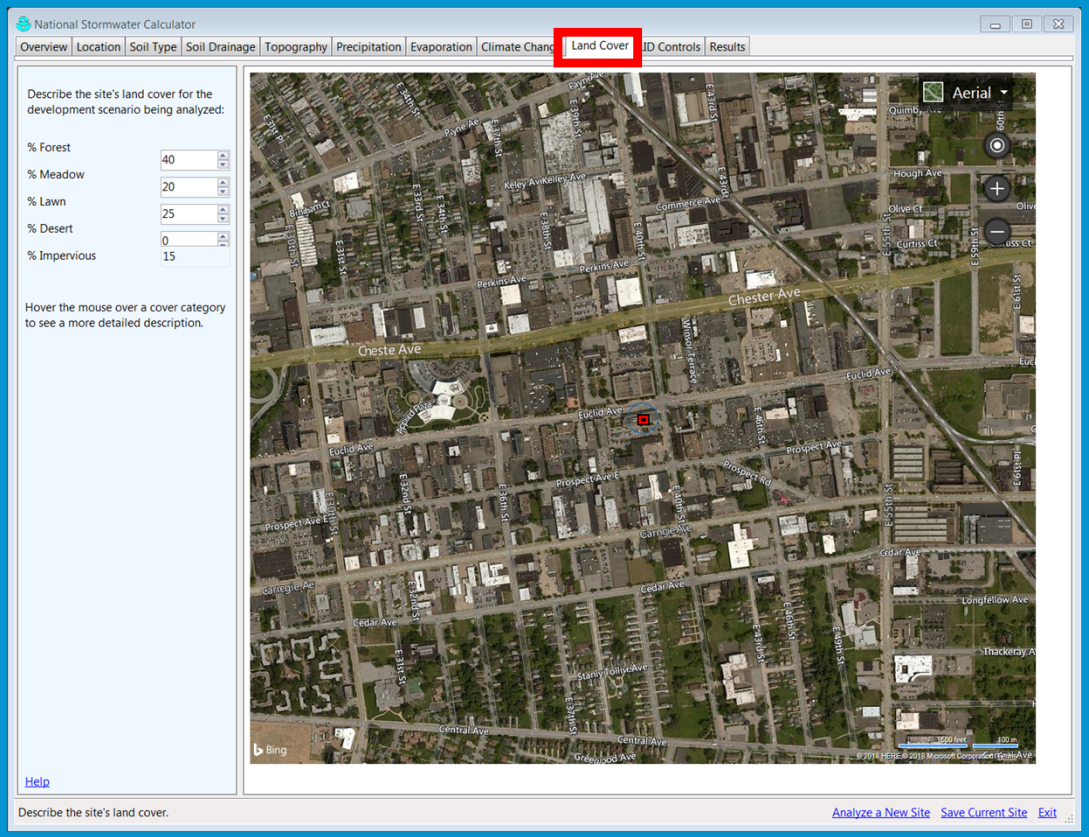
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Existing Conditions



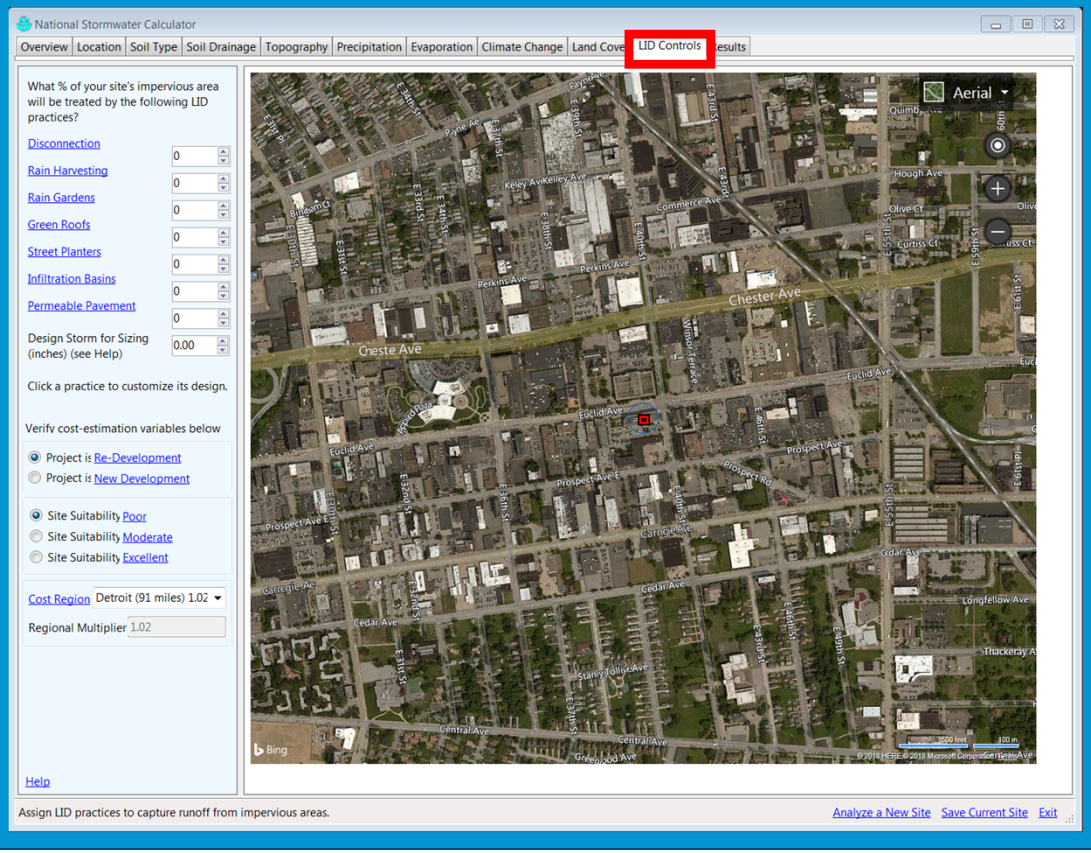
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Existing Conditions



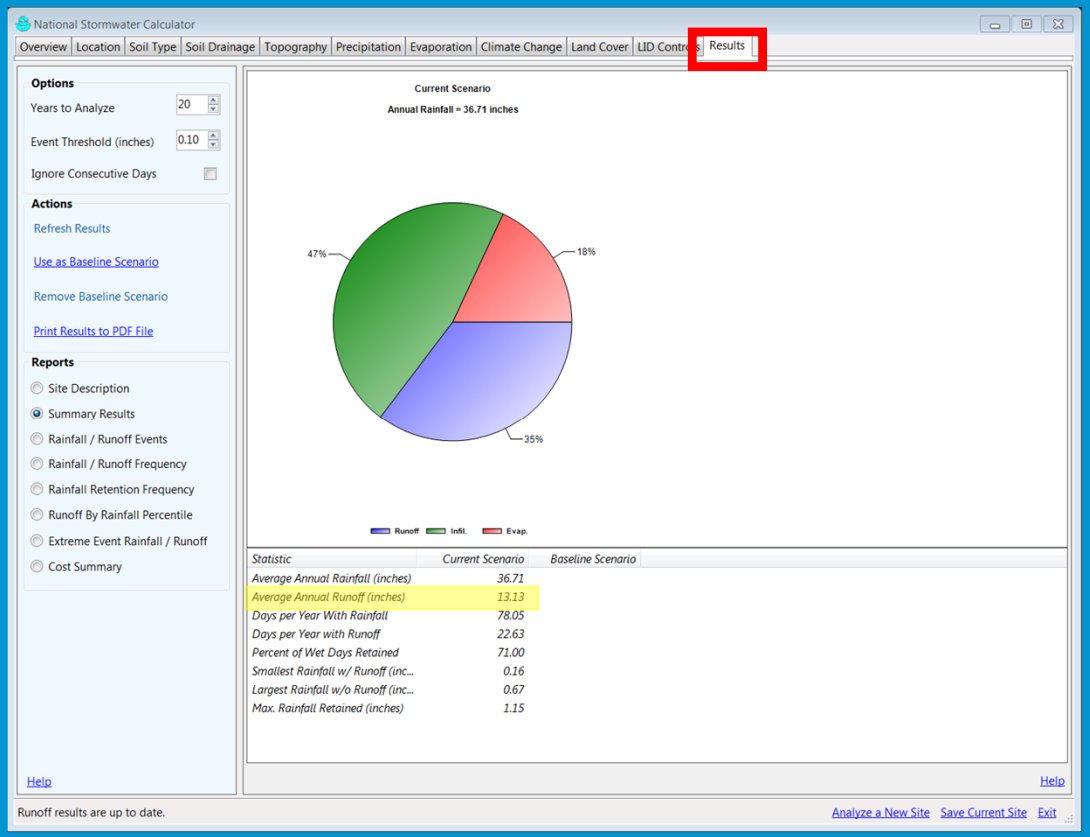
GI Grant Program Technical Requirements

EPA National Stormwater Calculator Modules – Existing Conditions



GI Grant Program Technical Requirements

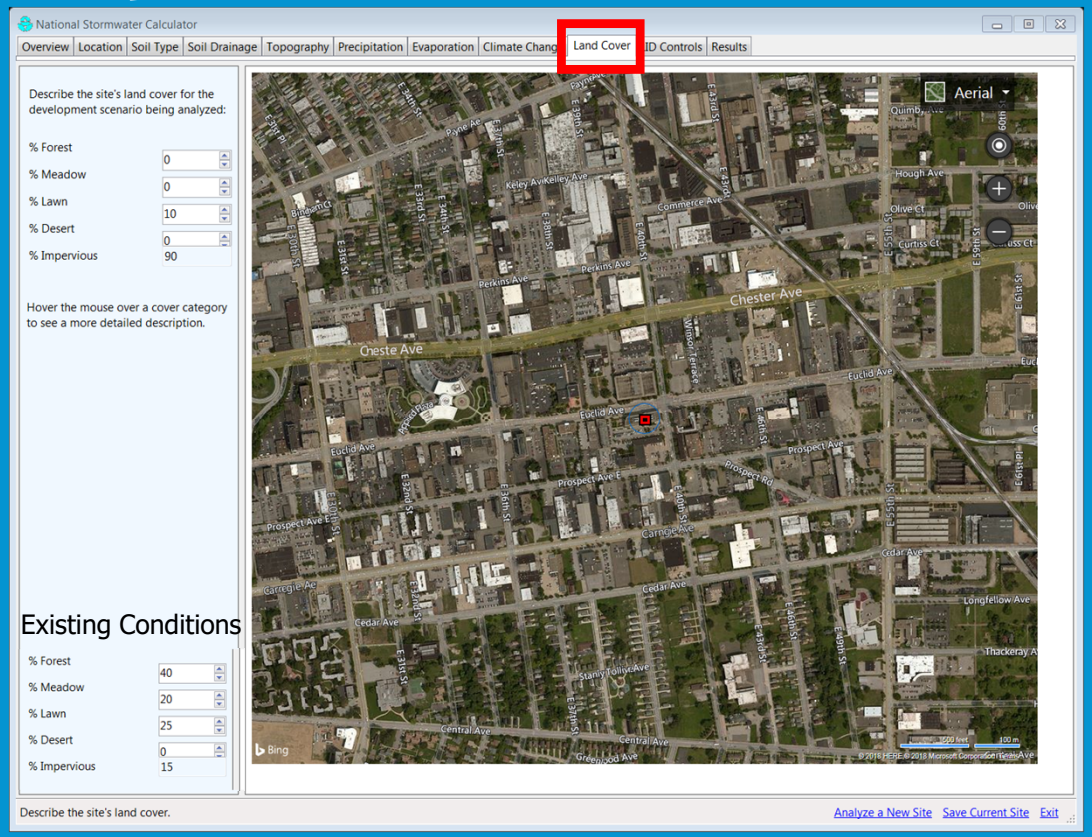
EPA National Stormwater Calculator Modules – Existing Conditions



GI Grant Program Technical Requirements

EPA National Stormwater Calculator - Baseline Scenario

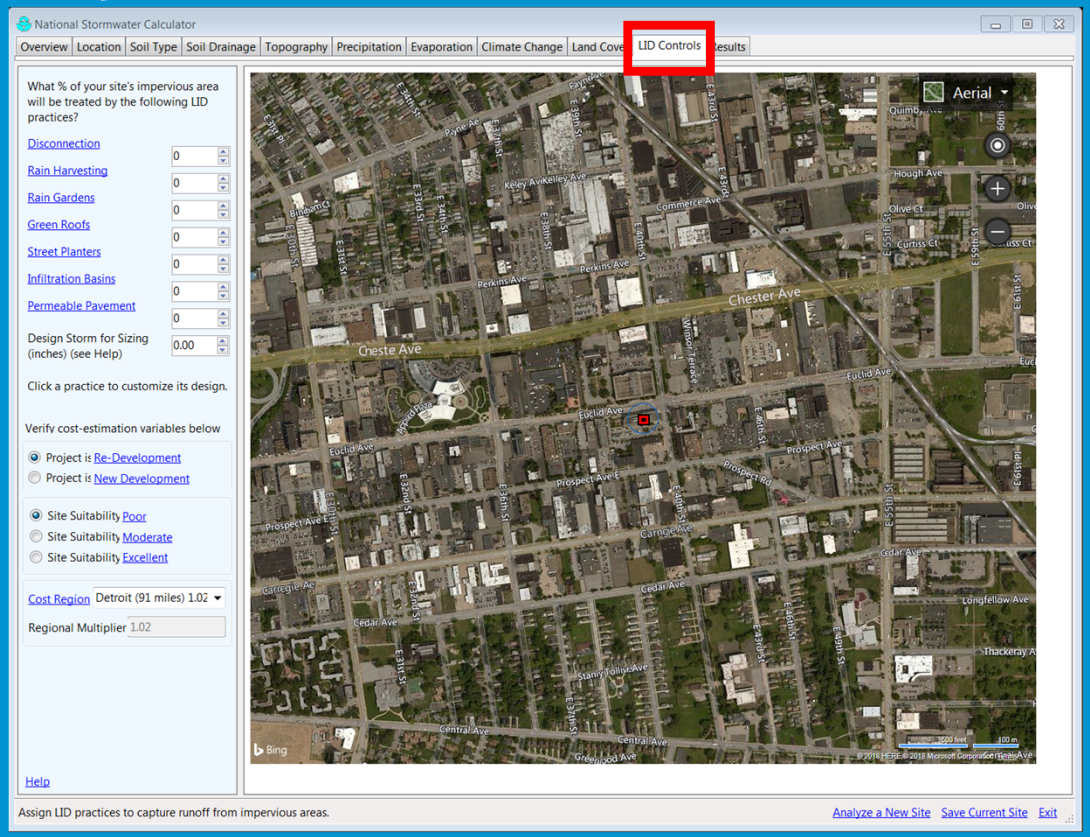
Meeting Minimum Title IV Requirements



GI Grant Program Technical Requirements

EPA National Stormwater Calculator - Baseline Scenario

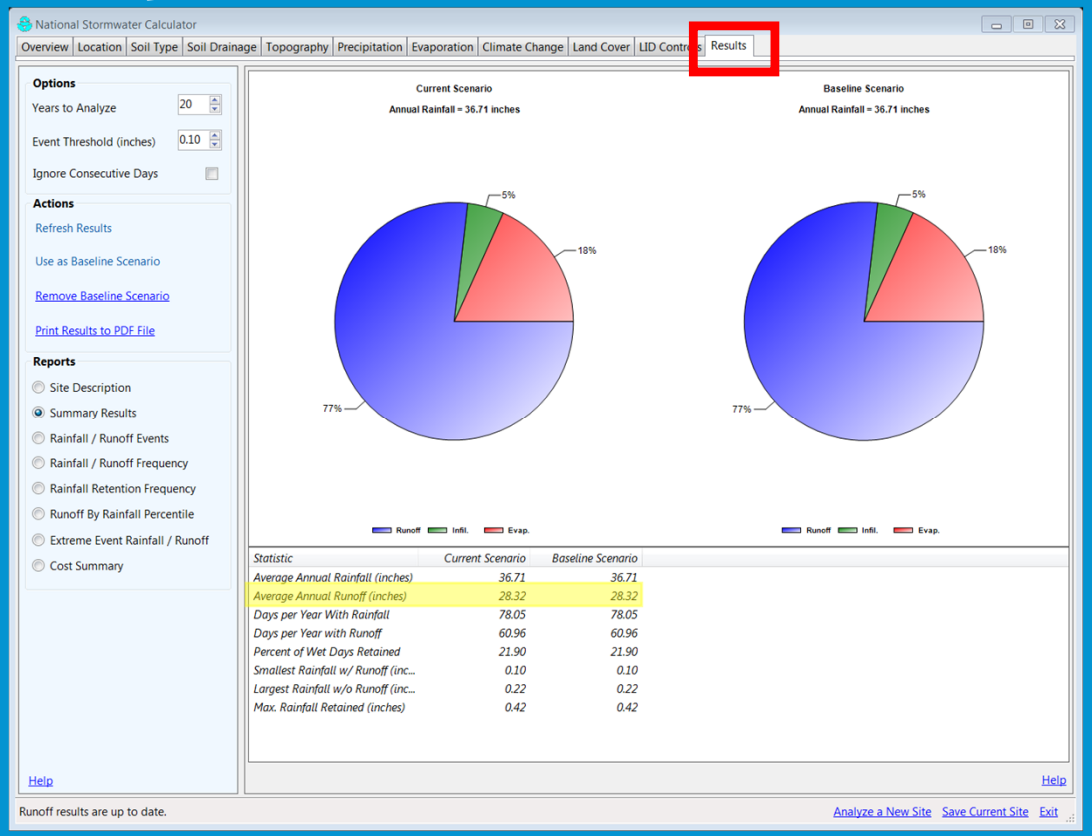
Meeting Minimum Title IV Requirements



GI Grant Program Technical Requirements

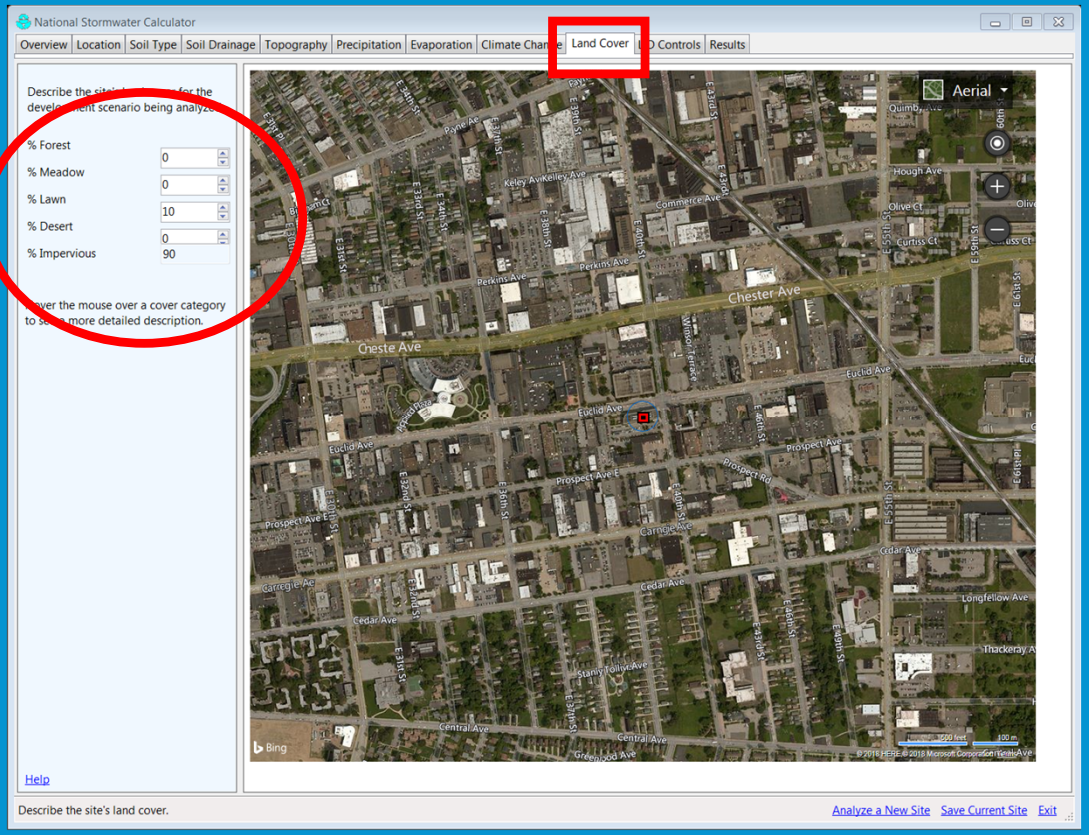
EPA National Stormwater Calculator - Baseline Scenario

Meeting Minimum Title IV Requirements



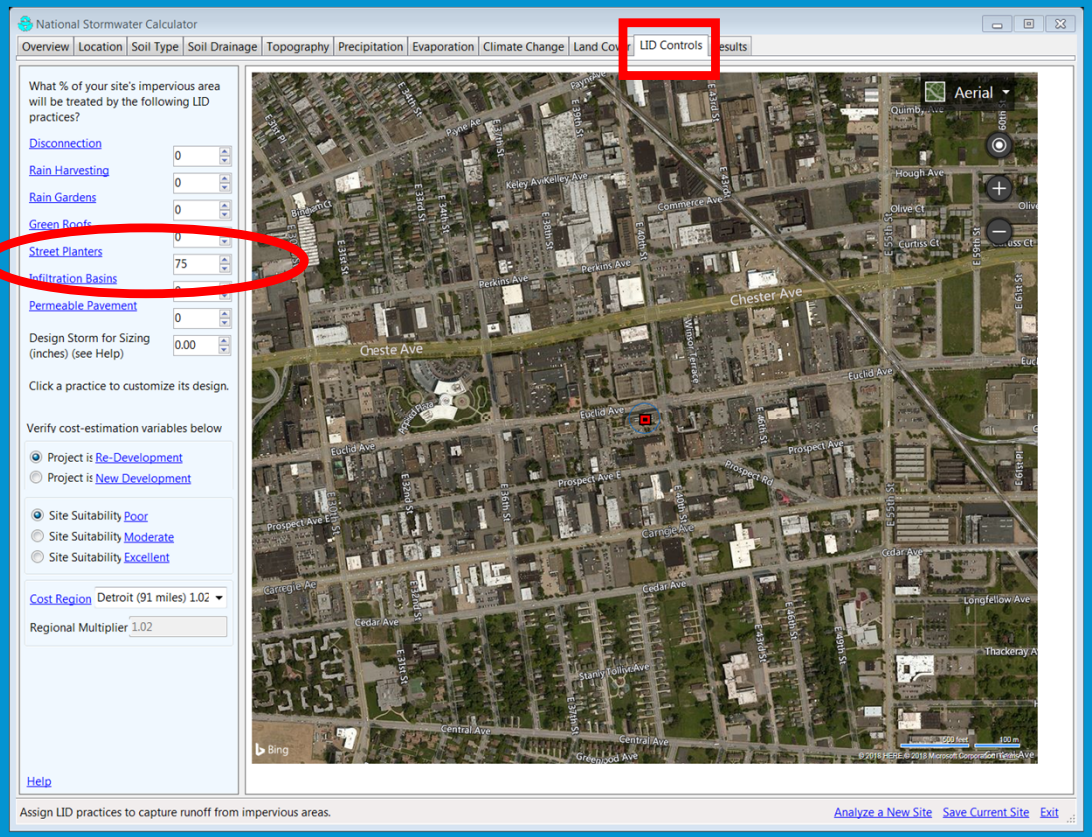
GI Grant Program Technical Requirements

EPA National Stormwater Calculator – with Green Infrastructure



GI Grant Program Technical Requirements

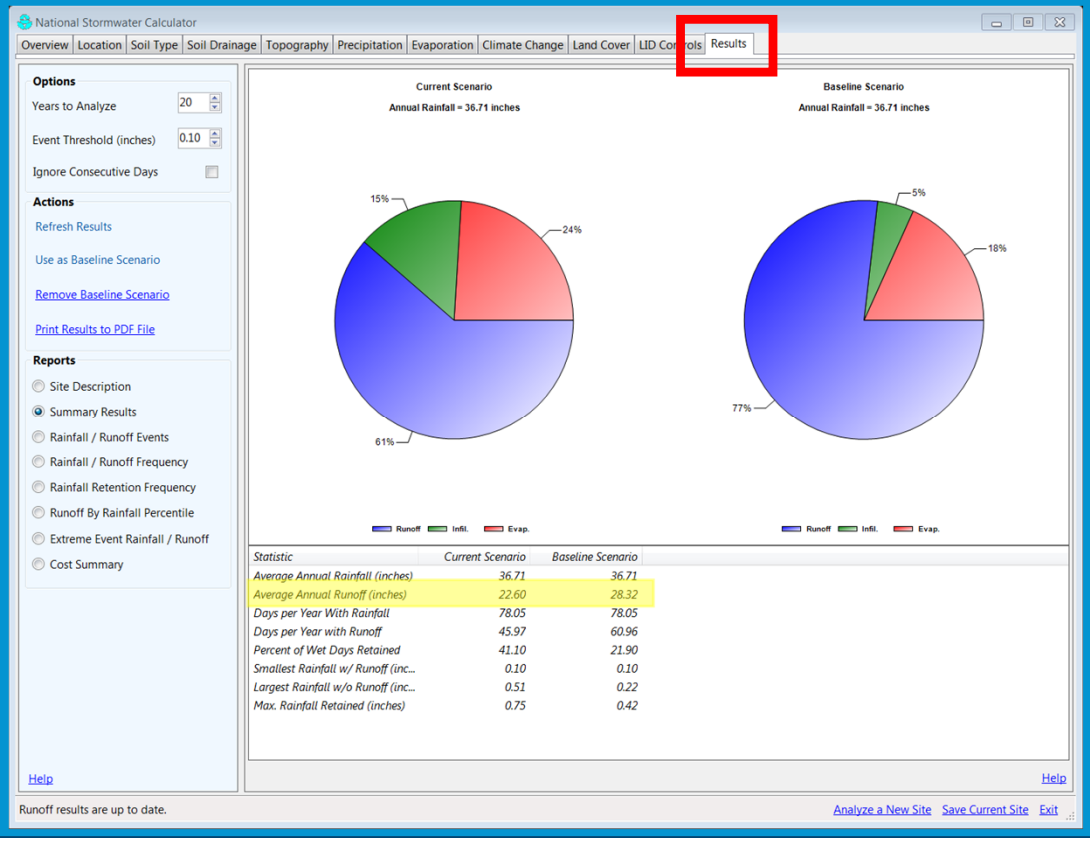
EPA National Stormwater Calculator – with Green Infrastructure



GI Grant Program Technical Requirements

EPA National Stormwater Calculator – with Green Infrastructure

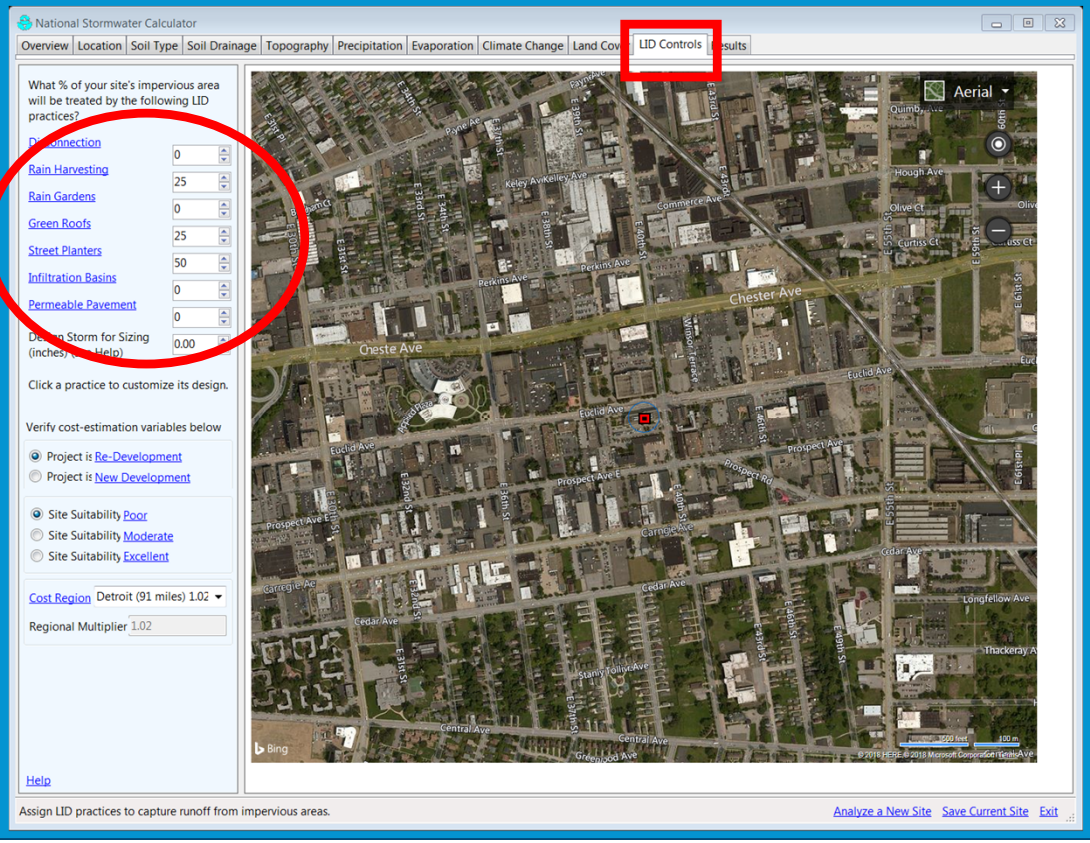
75% of Impervious Area to Street Planters



GI Grant Program Technical Requirements

EPA National Stormwater Calculator – with Green Infrastructure

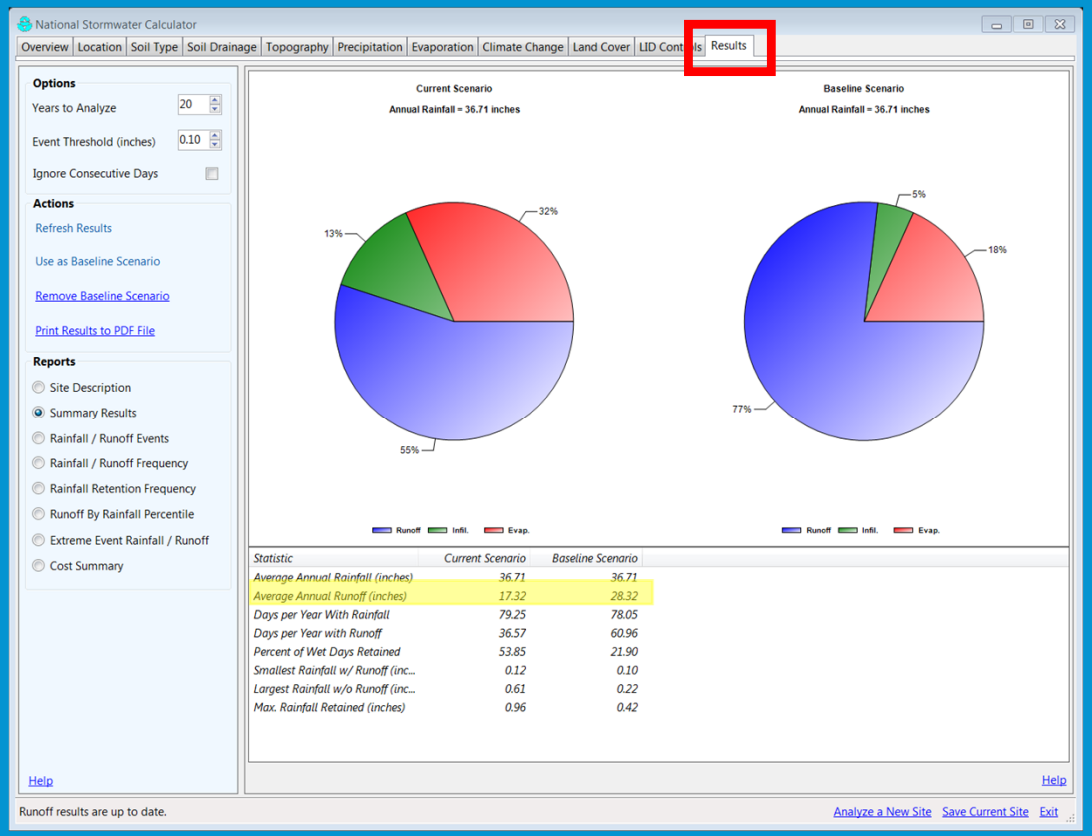
Multiple LID Controls



GI Grant Program Technical Requirements

EPA National Stormwater Calculator – with Green Infrastructure

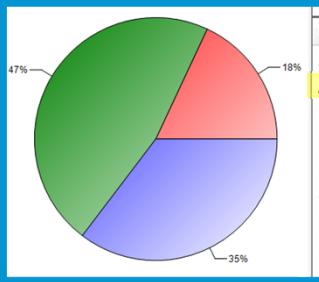
Multiple LID Controls



GI Grant Program Technical Requirements

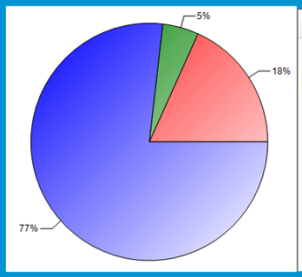
EPA National Stormwater Calculator

Existing Conditions



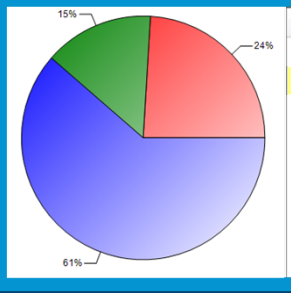
Statistic	Current Scenario
Average Annual Rainfall (inches)	36.71
Average Annual Runoff (inches)	13.13
Days per Year With Rainfall	78.05
Days per Year with Runoff	22.63
Percent of Wet Days Retained	71.00
Smallest Rainfall w/ Runoff (inc...	0.16
Largest Rainfall w/o Runoff (inc...	0.67
Max. Rainfall Retained (inches)	1.15

Minimum Title IV Requirements (Baseline Scenario)



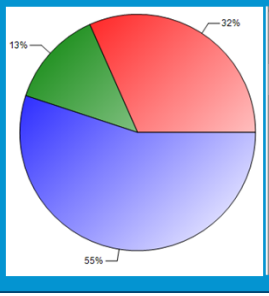
Statistic	Current Scenario
Average Annual Rainfall (inches)	36.71
Average Annual Runoff (inches)	28.32
Days per Year With Rainfall	78.05
Days per Year with Runoff	60.96
Percent of Wet Days Retained	21.90
Smallest Rainfall w/ Runoff (inc...	0.10
Largest Rainfall w/o Runoff (inc...	0.22
Max. Rainfall Retained (inches)	0.42

75% of Impervious Area to Street Planters



Statistic	Current Scenario
Average Annual Rainfall (inches)	36.71
Average Annual Runoff (inches)	22.60
Days per Year With Rainfall	78.05
Days per Year with Runoff	45.97
Percent of Wet Days Retained	41.10
Smallest Rainfall w/ Runoff (inc...	0.10
Largest Rainfall w/o Runoff (inc...	0.51
Max. Rainfall Retained (inches)	0.75

Multiple LID Controls



Statistic	Current Scenario
Average Annual Rainfall (inches)	36.71
Average Annual Runoff (inches)	17.32
Days per Year With Rainfall	79.25
Days per Year with Runoff	36.57
Percent of Wet Days Retained	53.85
Smallest Rainfall w/ Runoff (inc...	0.12
Largest Rainfall w/o Runoff (inc...	0.61
Max. Rainfall Retained (inches)	0.96

GI Grant Program Technical Requirements

EPA National Stormwater Calculator – Helpful Hints

Baseline Scenario

- Use existing conditions (pre-development) when impervious area does not increase
- Use proposed conditions that meet the minimum NEORSD Title IV requirements when impervious area increases

GI Grant Program Technical Requirements

EPA National Stormwater Calculator – Helpful Hints

Treatment Trains

- The SWC does not model treatment trains…beyond its capabilities
- Use Stormwater Management Model (SWMM); or…
- Be creative…justify your assumptions

GI Grant Program Technical Requirements

EPA National Stormwater Calculator – Helpful Hints

Treatment Trains

- A 15,000 sq.ft. Green Roof (GR) discharges to Permeable Pavement (PP)
- **Step 1:** Run the model for just the GR and its drainage area. Results in 45% capture; so assume 8,250 sq.ft. of the GR (55% of 15,ooo sq.ft.) continues to behave as impermeable and goes to the PP.
- **Step 2:** Run the model for just the PP and its drainage area, but also take into account the additional 8,250 sq.ft. of impervious area from the GR.
- The results from the PP model run should be used as your final result.

GI Grant Program Technical Requirements

EPA National Stormwater Calculator – Helpful Hints

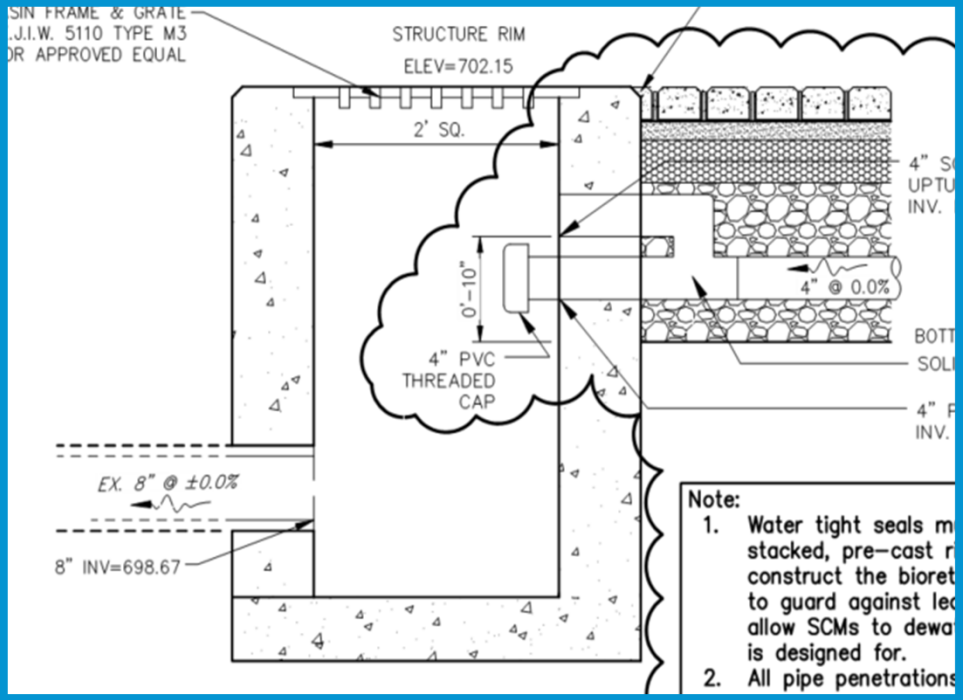
Underdrains

- Unless ideal soil conditions exist, underdrains are a necessary design feature for street planters and permeable pavement.
- Proposed standard underdrains will not negatively affect your grant application.
- Encouraged to alter the design of your underdrains to maximize infiltration potential (e.g., adding an upturned elbow).

GI Grant Program Technical Requirements

EPA National Stormwater Calculator – Helpful Hints

Upturned Elbow



GI Grant Program Technical Requirements

EPA National Stormwater Calculator – Helpful Hints

Unique Control Practices

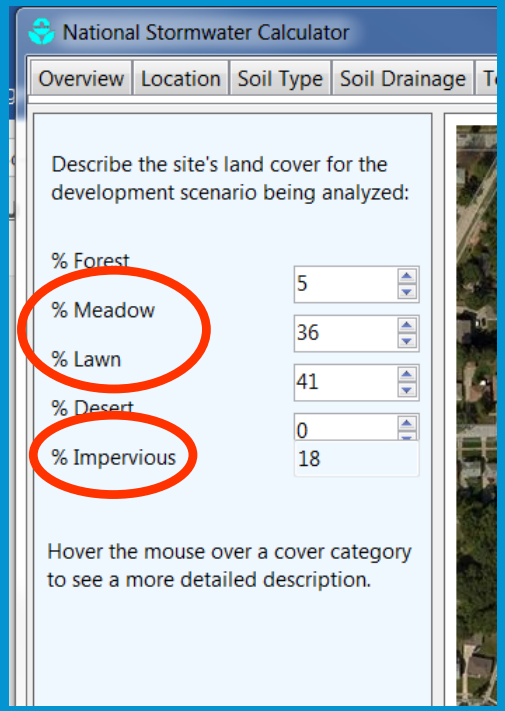
- If a proposed practice does not fit the mold of any of the calculator's options, use best professional judgement to select one or more of the seven LID Controls, and provide a brief narrative to justify selection.

GI Grant Program Technical Requirements

EPA National Stormwater Calculator – Helpful Hints

Land Cover Module

- Account for footprints of rain gardens, street planters and infiltration basins as Meadow or Lawn.
- Account for footprints of permeable pavement and green roofs as Impervious

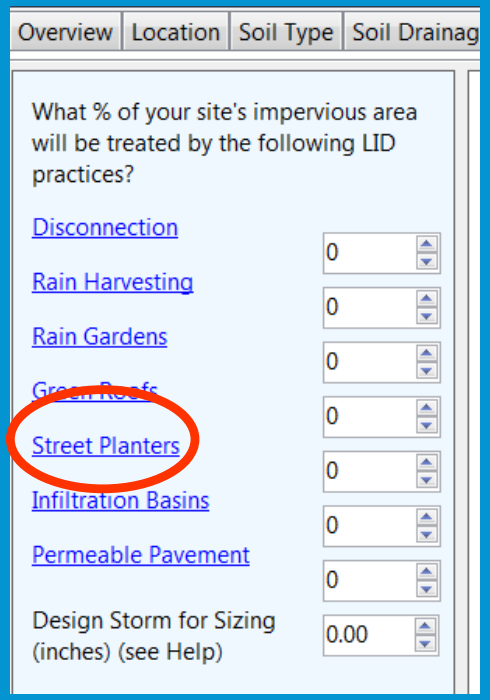


GI Grant Program Technical Requirements

EPA National Stormwater Calculator – Helpful Hints

LID Controls Module

- Bioretention cells & infiltration trenches = Street Planters
- Footprints of rain gardens, street planters and infiltration basins = Meadow or Lawn
- Footprints of permeable pavement and green roofs = Impervious



Jessica S. Cotton, GISP, GIP
Grant Programs Administrator (GIG Point of Contact)
216.881.6600 x6458
CottonJ@neorsd.org

Christopher Hartman, CPESC, CPSWQ, CESSWI
Stormwater Technical Specialist
216.881.6600 x6656
HartmanC@neorsd.org

Northeast Ohio
Regional Sewer District

Thank you