Ground Cover

- The runoff curve number (CN) is **an empirical parameter used in hydrology for predicting direct runoff or infiltration from rainfall excess**. Different ground cover or land types are assigned different CN's. The lower the CN, the higher the infiltration ability of the ground cover
- Based on the Runoff Curve Number table (Table 3.1.5-1) from the Georgia Stormwater Management Manual, the following are curve numbers (CN) applicable to Morven:
  - Wooded or forest land: ~60.5
  - Cultivated/agricultural land: ~76
  - Impervious areas: 98
  - Meadows: 58
- In the Cook and McCuen paper, ground cover type had the most significant hydrologic response change. A site with grassy fields beneath the solar panels had 7% less storm runoff rate compared to a site with gravel/bare ground underneath.

  Grassy/meadows have a lower CN as they have greater infiltration rates and produce less stormwater runoff. Land beneath the panels will consist of mainly grassy/meadows for the proposed Morven Solar Project.

Soil Type

- Soil type had slight significance on hydrologic response change. Four groups of soils were examined in the peer reviewed article: Groups A – D. Group A soils have high infiltration rate when thoroughly wet and have a high rate of water transmission. Group B soils have a moderate infiltration rate and moderately well drained soils. Group C soils have a slow infiltration rate and consists of a layer that impedes the downward movement of water. Group D soils have a very slow infiltration rate and consist of clay that have a high shrink-swell potential. Based on the article, runoff volume increased by 7.5% for Group C soils compared to Group B.

  - Based on the Morven Solar Soil Survey Report, the proposed site consists of mainly Groups A and B soils. Group B soils have higher infiltration and drainage rates compared to Groups C and D, which leads to slower runoff rates and better infiltration rates of stormwater across the site.

Summary – Based on the proposed ground cover (meadow) and soil types (Group B) of the site, stormwater runoff that may drain onto neighboring properties will drain at the same or slower rate than that of existing conditions.

Contamination – Commentors have expressed concerns related to soil contamination if a panel breaks and rainfall runs off the panel and onto the ground

To prevent any leakage or corrosion from occurring, solar panels are constructed with a protective layer of tempered glass on the rear of the panel. Beneath this glass, plastic ethylene-vinyl acetate (EVA) is placed to encapsulate the cell from any air or moisture. This EVA layer in PV panels keep broken panels intact. They are commonly used as layers of tempered glass in car windshields and hurricane windows to give them that extra strength.

- NC State University published a white paper in May 2017 by Tommy Cleveland called *Health and Safety Impacts of Solar Photovoltaics*. Cleveland described two PV technologies currently used in PV panels at utility-scale solar facilities: Crystalline Silicon and Cadmium Telluride (CdTe) PV Panels.

  Crystalline Silicon

  - 90% of solar PV panels installed today are crystalline silicon PV panels
  - Over 80% of the content of these panels is the tempered glass front and an aluminum frame, both common building materials
  - Small traces of lead are present in these PV panels. However, as stated in the *Health and Safety Impacts of Solar Photovoltaics*, "*very limited amount of lead involved and its strong*