Advocates for Herring Bay

Testimony of the Advocates for Herring Bay[1]
Regarding HB 1328, Energy and Energy Storage – Development and State Procurement
Submitted by Kathleen Gramp, February 27, 2024

Favorable with amendments

The Advocates for Herring Bay (AHB) commend the sponsors for proposing legislation calling for a study on lands suitable for in-state solar generation and establishing an Advisory Commission on ways to balance and manage competing land uses. Those measures are key to building a consensus on solar siting issues. Importantly, HB 1328 recognizes the need to preserve forests, soils, and natural resources and to establish vegetative ground covers that benefit the environment.

AHB urges the Committee to strengthen HB 1328 by amending the section on the Advisory Committee in two ways:

1. Direct the Advisory Commission to address stormwater runoff from ground-mounted solar projects. Maryland's solar-specific stormwater law was enacted in 2012. Since then, the state has been experiencing more intense rain events stemming from climate change. Maryland is now in the awkward position of having a law that forces state and local permitting agencies to ignore the effects of the solar panels when calculating runoff,[2] which can lead to underestimates of stormwater impacts from high rainfall events. As shown in Attachment 1, underestimates are especially common when rainfall exceeds one inch over a 24-hour period.

The environmental consequences of underestimating runoff can vary across the state. Recent research by the National Renewable Energy Lab found that runoff from solar projects largely depends on site-specific features, particularly soil compaction and the type of ground cover under and around the arrays.[3] As shown in Attachment 1, counties in Maryland's coastal plain regions may be at higher risk for runoff than counties in other areas because of differences in the density of their soils.

Proposed amendment: Updating Maryland's solar-specific stormwater policies would benefit the environment and may lower the cost of solar generation for projects that follow best practices. HB 1328 mentions stormwater in its directives to the Commission, but only to the extent it would inform policies about setbacks and screening. In our view, stormwater impacts should be a separate priority because of their importance in meeting Maryland's clean water goals and mandates, especially in MS4 jurisdictions.

Illustrative text for stormwater amendment

3-306.2(F)(3), page 5, line 23: strike "stormwater management"
3-306.2(F), page 5, line 27: insert new provision (6):

Updating Maryland's stormwater laws and permitting guidelines to incorporate best practices for estimating and managing runoff from solar facilities, including methods that account for the effects of solar panels, soil characteristics, and ground cover on runoff.

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[1] The Advocates for Herring Bay, Inc. is a community-based environmental group in Anne Arundel County.
[2] See HB 1117, which only allows the pole and base of the solar structure to be classified as an impervious surface.
[3] See Great Plains Institute, Best Practices: Photovoltaic Stormwater Management Research and Testing (PV-SMaRT), January 2023.

2. Appoint an environmental representative with expertise in land and water policies. To reach a sustainable consensus on solar siting issues, the Commission needs nongovernmental members with substantive expertise on the issues being studied. From an environmental perspective, this would be someone who could speak authoritatively on land and water matters, including stormwater mitigation and the challenges facing Maryland's forests, soils, and natural resources.

Illustrative text for amendment on environmental appointee:

3-306.2(A)(15), page 4, line 27:

Insert "with expertise in land and water resources" after "the State"

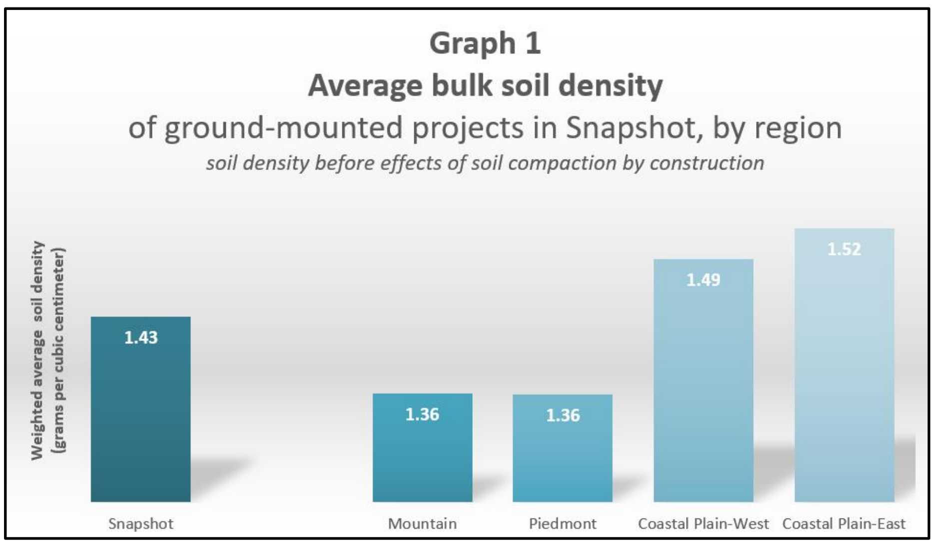
Attachment 1: Overview of Solar Stormwater Runoff Estimates and Issues

Presentations at a recent conference convened by the Chesapeake Bay Program addressed some of the challenges and opportunities for managing stormwater runoff from solar arrays.[4] The conference included a review of a federally funded modelling effort known as "PV-SMaRT," which is being developed by the National Renewable Energy Lab (NREL) and the Great Plains Institute (GPI) to estimate the key drivers of runoff from solar projects.[5]

Policymakers can use the PV-SMaRT calculator to gauge how estimated runoff may differ under varied environmental conditions.[6] Key inputs to the model include the density and depth of the soil, the type of ground cover under the arrays, and rainfall in a 24-hour period. All of the data presented in this Attachment assume that solar panels have an average width of 10 feet and are installed in rows 25 feet apart.

To apply the model to conditions in Maryland, AHB developed a "snapshot" of the types of soils under existing ground-mounted solar arrays using the U.S. Department of Agriculture's (USDA's) Web Soil Survey.[7] Because of data limitations, it was not possible to account for every ground-mounted solar project in the state. However, AHB's snapshot covers over 1,700 acres of solar arrays spread across 20 counties and may provide reasonable parameters for estimating stormwater runoff using the PV-SMaRT calculator.[8]

Graph 1 summarizes USDA's data on the weighted-average bulk density of the soils at the sites shown in the Snapshot. Because of the data limitations, this analysis aggregates the county-level results into broad geographic regions.[9] Several sites had slopes higher than 10 percent, notably those on brownfields, but all of the runoff estimates presented here assume lower slopes. USDA's data also suggest that soil depths will exceed the 60-inch metric used in the PV-SMaRT calculator.

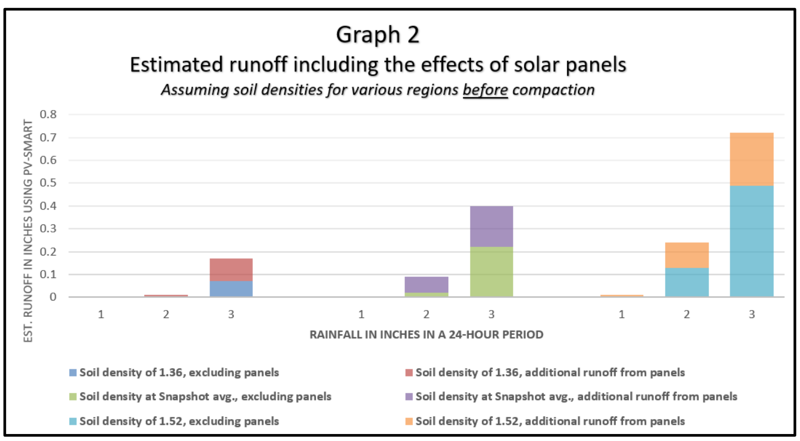


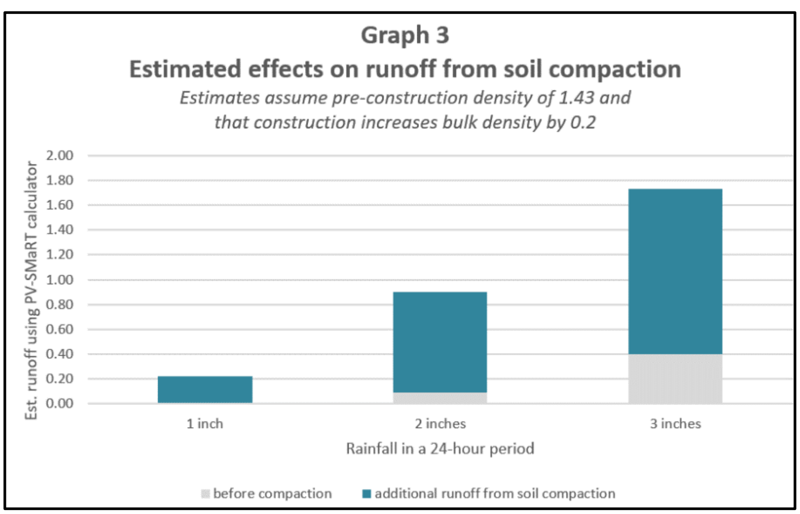
[4] See the proceedings of the April 2023 Scientific and Technical Advisory Committee's conference on Best Management Practices to Minimize Impacts of Solar Farms on Landscape Hydrology and Water Quality
[5] See Great Plains Institute, Best Practices: Photovoltaic Stormwater Management Research and Testing (PV-SMaRT), January 2023.
[6] NREL's overview of the PV-SMaRT program includes a link to the PV-SMaRT calculator.
[7] See USDA Web Soil Survey.
[8] See Advocates for Herring Bay, Solar Soil Snapshot, 2024.
[9] For this analysis, the "Mountain" region includes Allegany, Garrett, and Washington Counties; "Piedmont" includes Baltimore, Carroll, Frederick, Harford, Howard, and Montgomery Counties; "Coastal Plain-West" includes Anne Arundel, Charles, and Prince George's Counties; and "Coastal Plain-East" includes Caroline, Cecil, Dorchester, Kent, Queen Anne's, Talbot, Wicomico, and Worcester Counties.

The following graphs summarize estimates of potential stormwater runoff trends in Maryland using the PV-SMaRT calculator and data from AHB's Snapshot. Unless otherwise noted, the estimates assume that the ground cover under the solar panels is turf grass. In addition, the estimates of runoff account for mitigation benefits of the "disconnection" distances between rows of panels. That is, the amounts shown are the incremental amounts of runoff not addressed by the vegetation between rows.

- Graph 2 shows the importance of including the solar panels in the calculation of impervious surfaces, especially as Maryland experiences more intense rain events;
- Graph 3 attests to the importance of accounting for the effects of bulk soil density on stormwater runoff, especially after any soil compaction resulting from construction[10];
- Graph 4 illustrates the importance of accounting for the geographic diversity of soil densities among projects and regions of the state; and
- Graph 5 shows variations in the amounts of runoff that can be absorbed by different types of ground covers under the solar panels.

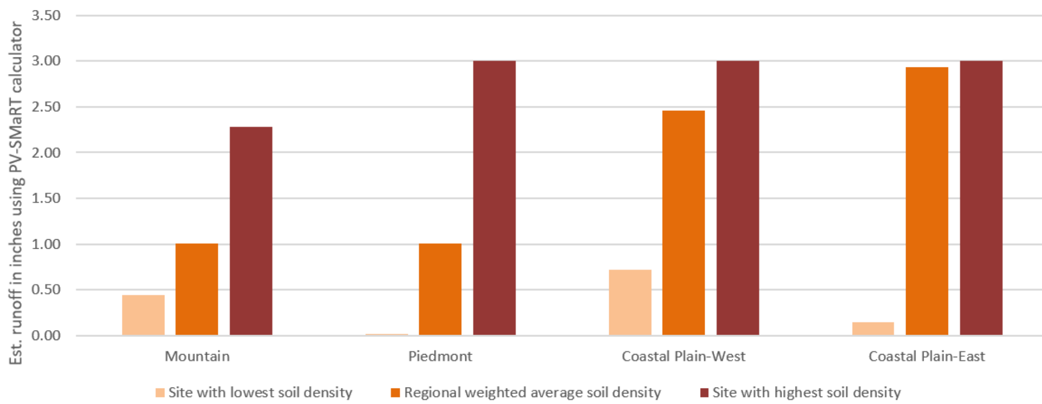
Finally, sustaining the infiltrative capacity of vegetation over the multi-decade life of solar projects will require continuous monitoring and maintenance. Patchy growth—which increases stormwater runoff—is already an issue for some existing Maryland solar projects (see Figure 1).





[10] This analysis assumes that compaction will increase soil density by 0.2, the amount estimated by the Center for Watershed Protection for "construction, no grading." See Stormwater Center, Compaction of Urban Soils.

Graph 4
Variation in estimated runoff by sites and geographic regions
Assuming 24-hour rainfall of 3 inches
Estimates include the effects of soil compaction



Graph 5
Estimated runoff using different ground covers under solar panels
Assuming Snapshot average soil density after compaction (1.63)
Assuming 24-hour rainfall of 3 inches

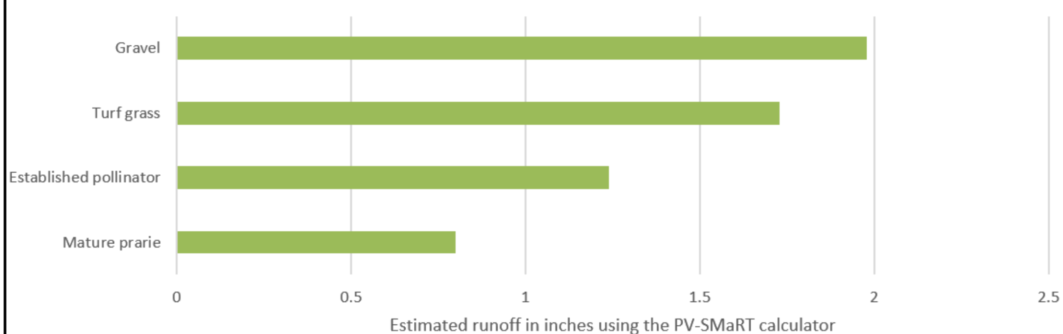


Figure 1
Patches in Vegetation Increase Runoff
Current Examples in Maryland

Source: U.S. Department of Agriculture, Web Soil Survey

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