Testimony of the Advocates for Herring Bay[1]
Regarding SB 1025 – Public Utilities – DGCPCN
Submitted by Kathleen Gramp, March 6, 2021

Favorable with amendments

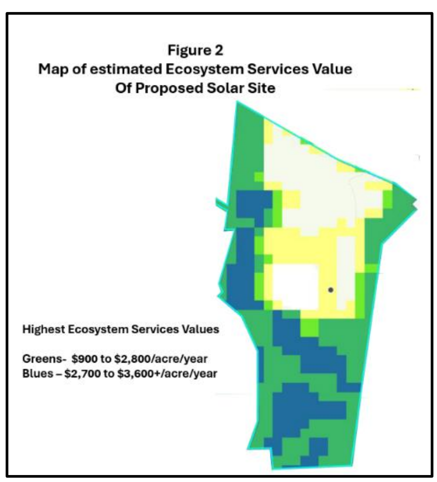
SB 1025 would affect environmental standards for developing solar generation projects in Maryland. It would establish a new regulatory framework for the cohort of projects between 2 and 5 megawatts of capacity (or DGCPCN[2]), allowing those projects to be approved on an expedited basis if they meet standard conditions and procedural requirements. Under the bill, that regime would include uniform standards for addressing impacts on forests and stormwater runoff, subject to certain limitations.

The Advocates for Herring Bay (AHB) commend the sponsors for acknowledging the importance of minimizing the impacts of solar projects on runoff and ecologically valuable lands. We are concerned, however, that SB 1025 will be ineffective in managing environmental impacts unless the bill is amended in the following two ways:[3]

1. Conserve forests by limiting impacts to incidental amounts with an insignificant ecological impact. SB 1025 calls for consideration of forest conservation "except where necessary to reduce solar panel shading; facilitate interconnection infrastructure; and ensure adequate site access." In the absence of any statutory safeguards, that open-ended language would allow a developer to clearcut forested areas to allow for construction and production. The need for guardrails is not an abstract issue. As shown in Figure 1, developers have built solar facilities on forested parcels in Maryland.

Proposed amendment. At a minimum, AHB recommends that this language be amended to establish a presumption that forests should be conserved, with an allowance only for incidental and insignificant losses or disturbances of forests or other ecologically valuable resources.

AHB also recommends that the bill provide an analytical basis for evaluating the scale of any impacts. In lieu of bright lines, like the number of acres cleared, we suggest using the cutting-edge tool developed by the Maryland Department of Natural Resources (DNR) to quantify Ecosystem Services Values (ESV). The color-coded mapping tool on the state's Greenprint GIS website (see example of a proposed solar site in Figure 2) would allow agencies and applicants to quickly gauge the likelihood and extent of impacts on ecologically valuable resources.



[1] The Advocates for Herring Bay, Inc. is a community-based environmental group in Anne Arundel County.
[2] DGCPCN refers to Distributed Generation projects receiving a Certificate of Public Convenience and Necessity.
[3] Illustrative text for possible amendments is provided at the end of this document.

2. Ensure that stormwater and erosion standards reflect recent research on best practices. 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,[4] 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 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 density and compaction and the type of ground cover under and around the arrays. As shown in Attachment 1, counties in Maryland's coastal plain regions may be at higher risk for runoff than those elsewhere because of differences in the density of their soils. Even within counties, projects differ in their soil characteristics. Accounting for those differences is especially important for mitigating runoff in MS4 jurisdictions.

Proposed amendment: Acting now to update Maryland's solar-stormwater standards would yield environmental benefits over the multi-decade life of DGCPCN projects and may lower the cost of solar generation for those that follow best practices.[5] Thus, AHB urges the Committee to amend HB 1046 to require that the stormwater standards applied to DGCPCN projects account for the latest research on best practices, including methods that reflect the effects of the solar panels, the geographic diversity of Maryland's soils, and effectiveness of different ground covers.

Illustrative text for amendments to address AHB policy issues

Item 1: Environmental Preservation and Forest Conservation

7-207.3(B)(2)(III), page 4
Line 16, strike "except where necessary to"
and insert
"giving consideration to the need for incidental impacts that would have an insignificant effect on the Ecosystem Services Value of the project site as estimated by the Department of Natural Resources and are necessary to"

Item 2: Stormwater Management, Erosion Control

7-207.3(B)(2)(IV), page 4
Line 21, insert after "stabilization"
that accounts for the effects on runoff of the solar panels, soil density and compaction, and ground cover under and around the panels.

[4] See HB 1117, which only allows the pole and base of the solar structure to be classified as an impervious surface.
[5] See Great Plains Institute, Best Practices: Photovoltaic Stormwater Management Research and Testing (PV-SMaRT), January 2023

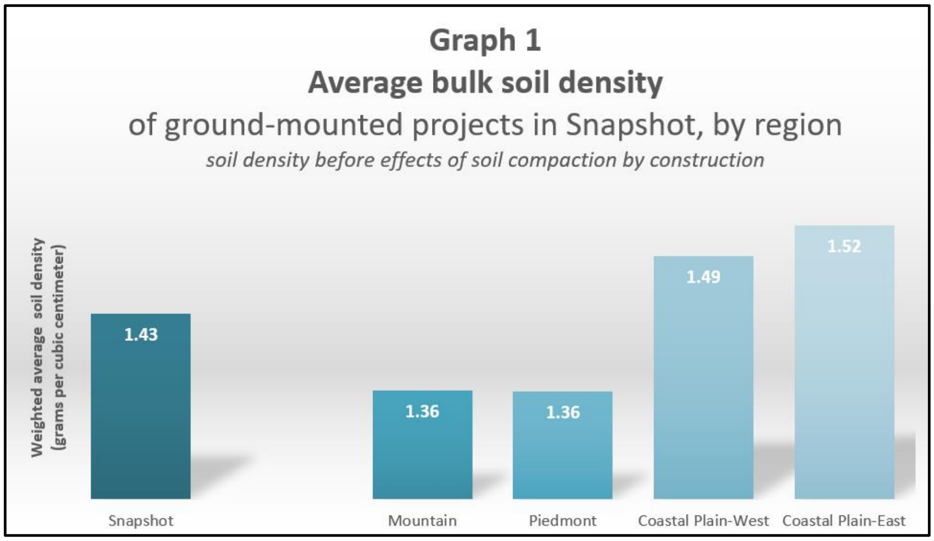
Attachment 1: Overview of Solar Stormwater Runoff Estimates and Issues

Presentations at an April 2023 conference convened by the Chesapeake Bay Program addressed some of the challenges and opportunities for managing stormwater runoff from solar arrays.[6] 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.[7]

Policymakers can use the PV-SMaRT calculator to gauge how estimated runoff may differ under varied environmental conditions.[8] 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.[9] 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.[10]

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.[11] 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.



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[6] 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

[7] See Great Plains Institute, Best Practices: Photovoltaic Stormwater Management Research and Testing (PV-SMaRT), January 2023.

[8] NREL's overview of the PV-SMaRT program includes a link to the PV-SMaRT calculator.

[9] See USDA Web Soil Survey.

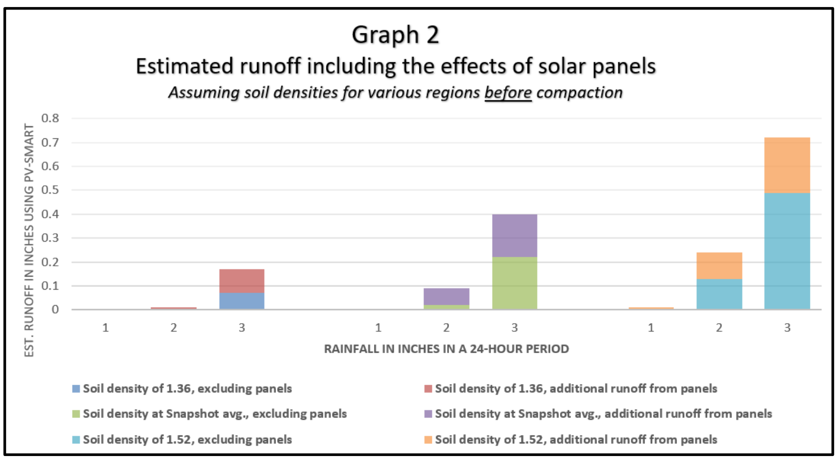
[10] See Advocates for Herring Bay, Solar Soil Snapshot, 2024.

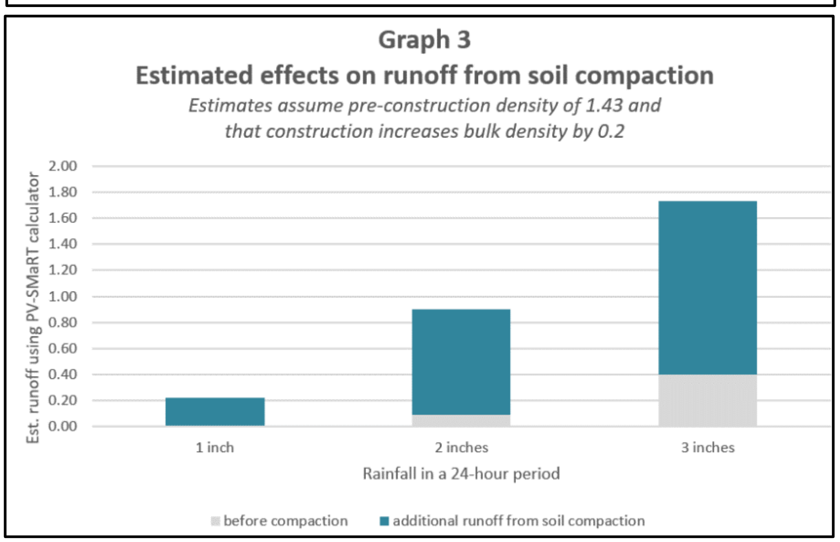
[11] For this analysis, the "Mountain" region includes Allegany, Garrett, and Washington Counties; "Piedmont" includes Baltimore, Carroll, Frederick, Harford, Howard, and Montgomery Counties; "Coastal Plain-West" includes Anne Arundel, Charles, and Prince George's Counties; and "Coastal Plain-East" includes 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[12];
- 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.

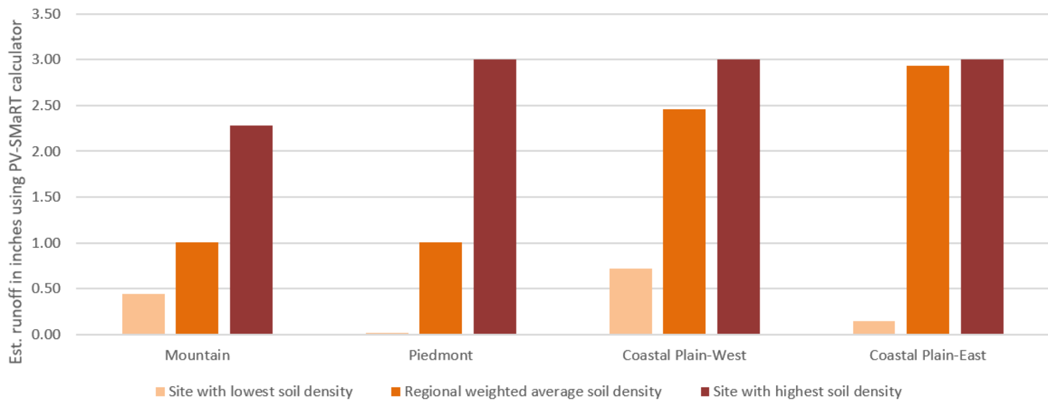
Finally, sustaining the infiltrative capacity of vegetation over the multi-decade life of solar projects will require continuous monitoring and maintenance. Patchy growth—which increases stormwater runoff—is already an issue for some existing Maryland solar projects (see Figure 1).





[12] 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

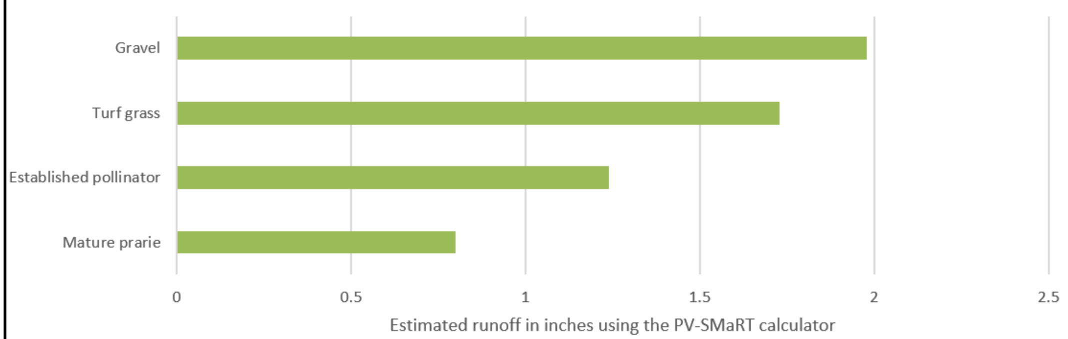


Figure 1
Patches in Vegetation Increase Runoff
Current Examples in Maryland

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

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