SIERRA CLUB
MONTGOMERY COUNTY, MD

To
The Montgomery County Council
100 Maryland Avenue
Rockville, MD 20850

February 28,2020

Reg: Zoning Text Amendment (ZTA) 20-01
Position: Support with Amendments

Dear County Council President Katz and Council Members,

Zoning Text Amendment (ZTA) 20-01 as proposed will allow the development of small (2 megawatt or less) solar energy generation arrays on a very limited amount of land in the county's Agricultural Reserve. Sierra Club Montgomery County supports this ZTA with amendments, as detailed below.

Sierra Club Montgomery County's position on ZTA 20-01 reflects Sierra Club Maryland Chapter's significant experience over five years with the issues of siting solar projects in Maryland, especially on agricultural land. As now with Montgomery County, Sierra Club Maryland has worked with County level Sierra Clubs in Anne Arundel, Baltimore, Frederick, Howard, and Prince George's counties in discussion and development of local solar siting policies. In this process, we have worked with local and state government, environmental, land preservation, agricultural, solar development, and technical organizations. In 2018, we collaborated with the Maryland Association of Counties to organize a consultative forum on solar siting that drew on the experiences of county-level political representatives and planners, the Public Services Commission (PSC), environmental organizations including Sierra Club and League of Conservation Voters, the Maryland Farm Bureau, Preservation Maryland, and representatives of the solar industry working in Maryland. In 2019, we participated in the multi-disciplinary consultation on solar siting convened by leadership of the Maryland House of Delegates Environment and Transportation Committee. And, the lead author of this testimony, Dr. Alfred Bartlett, has served since 2015 as an active member of the PSC-led Working Group that developed the regulations and implementation arrangements for the legislatively-established Community Solar Pilot Program and which continues to monitor and troubleshoot its implementation.

While this background gives us substantial experience upon which to draw, perhaps the most important take-away from this experience is the understanding that solar siting on open land is a sensitive matter in which there are multiple valid perspectives and positions that need to be considered and balanced. In our work with all these other organizations, we and they have become convinced that there exist "win-win" approaches to solar siting on agricultural land. Our testimony aims to contribute to Montgomery County having such a win-win approach through this ZTA.

Our position is based on the following major points:

- **The reality of climate change makes rapid development of solar energy an urgent necessity** – As an environmental organization, one of Sierra Club's overarching priorities is conservation. Therefore, we have substantial common cause with farmers and land preservationists.

However, like the County Council, we are aware that climate change is not a future threat - it's a present reality whose effects are already being felt in our state. Those effects include increasingly heavy rain with life- and property-destroying flooding, as in Ellicott City; growing heat waves that threaten lives and health, especially in urban areas; and the almost 30,000 Maryland homeowners already threatened by sea level rise and coastal flooding. The electricity sector's use of fossil fuels is now Maryland's second largest source of greenhouse gases – both carbon dioxide and methane – that drive climate change. As other sectors like vehicular transportation electrify, cleaning up the electricity sector will only become more urgent.

The reality of climate disruption means that we need to move urgently to reduce greenhouse gases. Electricity production is the sector where we already have the low cost, highly effective, technically feasible and scalable technologies to achieve these urgent reductions in carbon and methane pollution, through rapid replacement of fossil fuels with wind and solar.

For Montgomery County, solar energy will have to be an important component of a transition to clean renewable energy economy. The reality is that a substantial part of that solar will have to be built on open land.

- **Montgomery County can't build all the solar it needs on just rooftops, parking lots, brownfields, or commercial/industrial property –** To achieve its requirements at a 100% clean renewable energy end point (as anticipated to happen in 2040 by both the 2019 Clean Energy Jobs Act and the Hogan Administration, and the county's 2035 goal), Maryland will require about 35,000 MW of clean energy (wind, solar, and small hydropower).[1] With just over 1/6th of Maryland's population, Montgomery County will need about 6050 MW of that clean renewable energy.
  - *How much of that clean renewable energy will need to be from solar?* Estimates for Maryland of the solar proportion of total clean renewable energy range from 32%[2] to 48%[3] (the remainder would almost all be from onshore or offshore wind, largely imported from outside the county). Using the midpoint estimate of 40%, the county will need almost 2500 MW of solar generating capacity.
  - *How much of that 2500 MW can be on rooftops?* In 2016, the National Renewable Energy Laboratory (NREL) used LIDAR and other techniques to estimate the "Technical Potential Rooftop Capacity" for photovoltaic solar in each state;[4] they also provided their data estimates by zip code. In 2018, the PSC-mandated study of solar electricity generation on Maryland's overall electricity supply used the NREL data to get an aggregate estimate for each utility's service area.[5] The "Technical Potential Rooftop Capacity" estimate for the Pepco region was 4,433 MW; on a population basis, Montgomery County is 53% of the Pepco region, making the county's estimate of technical rooftop potential 2,350 MW.

[1] This figure is based on current consumption – the actual future requirement will vary depending on the balance between energy use reductions from increased efficiency and reduced demand, versus increased requirements from vehicle and other electrification.

[2] Jacobson MZ *et al*, *100% Clean and Renewable Wind, Water, and Sunlight (WWS) - All-Sector Energy Roadmaps for the 50 United States*, Energy and Environmental Science; April 2015

[3] Institute for Energy and Environmental Research, *Renewable Energy Capacity Analysis* (for 2018 100% Clean Renewable Energy legislation); October, 2017

[4] Gagnon P et al (National Renewable Energy Laboratory), *Rooftop Solar Photovoltaic Technical Potential in the United States: A Detailed Assessment*; January, 2016

[5] Daymark Energy Advisors *et al*, *Benefits and Costs of Utility Scale and Behind the Meter Solar Resources in Maryland*; September, 2018

  - However, citing economic and regulatory factors and the need for "ground-truthing," NREL notes that "Technical Rooftop Potential" is significantly higher than actual potential. Solar development experience indicates that a large fraction of roofs deemed to have "technical" solar potential turn out not to be feasible because of structural issues, physical obstacles, roof condition, legal status of the property, and other factors.
  - Therefore, a 50% factor is used to estimate actual rooftop solar potential; this makes the estimated rooftop potential for Montgomery county to be 1,175 MW.
- Economic factors also affect the timing of rooftop solar development: because solar arrays have a lifetime of at least 20 (probably 25) years, it is not cost-effective to build solar on a roof that will need replacement during the lifetime of the array – this would mean taking down the solar array and rebuilding it. The time to build solar on a roof is when the roof is new or being replaced, or has very recently been built or replaced.
  - This cost-effectiveness dimension means that the roll-out of rooftop solar would likely take more than a decade. This factor does not apply to ground-based solar.
- Additionally, rooftop solar electricity generation generally provides only part of the energy requirements of those occupying the building itself. On a very sunny day, an array may put some extra electricity onto the grid, but the resulting credit will be used by the occupants themselves later when there is less sunshine. The net result is that rooftop solar will not provide clean energy to those not occupying the buildings having solar arrays.
- Solar, like other enterprises, has economies of scale; arrays larger than those fitting on any size roof will be required to provide low cost clean energy to those not having solar on their roofs.
- Parking lots offer some additional solar potential. The main barrier to parking lot solar has been cost: the greater structural requirements along with electrical and physical safety factors make solar parking canopies one of the most expensive forms of solar project. Unlike rooftops, NREL has not generated state- and locality-specific estimates of parking lot solar capacity. However, in 2015 there were only 600 MW of parking lot solar in the whole US; estimates were that the amount would reach about 1800 MW in the US by 2018.[6] The Maryland Energy Administration offers grants to help offset the greater cost of parking lot solar arrays – maximum grant size is $200,000, and total funding is $2 million (equal to 10 full-size projects).[7]
- In densely populated compact development areas like Bethesda, and in many shopping malls, multi-level parking garages are more prevalent than open parking. Building solar on top of these garages is feasible, but also expensive; it is also limited by the weight load capacity, connection capacity, and structural characteristics of an existing garage.
- Like rooftop solar, parking lot solar basically fills part of the power need of the parking lot owners (or potentially for charging electric vehicles parked underneath). In terms of net production, they don't provide electricity to the larger community of homes and buildings that don't themselves have solar.
- In terms of brownfields (contaminated lands) and landfills, a 2018 in-depth technical analysis of 402 EPA-identified potential sites in Maryland[8] found no viable brownfield sites in Montgomery County. There are a limited number of landfill sites, some of which already are, or are planned to be, used by County Government itself for solar development.

[6] Rooney C, *The best idea in a long time: Covering parking lots with solar panels*; Washington Post, January 28, 2015
[7] Maryland Energy Administration, New Cycle of the Solar PV Parking Canopy Grant Now Open https://news.maryland.gov/mea/2019/07/03/new-cycle-of-the-solar-pv-parking-canopy-grant-now-open/ (July 3, 2019)
[8] Utility Scale Solar Energy Coalition, *Solar Development Potential on Contaminated Lands in Maryland*; October, 2018

- Building solar arrays on land zoned "commercial" or "industrial" in Maryland is not economically feasible: the most recent USDA survey found the average value of agricultural "land and buildings" in Montgomery County to be $8,213 per acre (Maryland average value was $7,861, and Prince George's was $8,132).[9] In contrast, the county's commercial and industrial land is far more expensive, almost entirely in the price range of $100,000 to $1 million (or more) per acre. Land cost – along with factors like distance to interconnection and the value of Solar Renewable Energy Credits – is a major determinant of economic feasibility, especially for the relatively small solar projects that can be built in Maryland. The hugely greater cost of commercial and industrial land here makes the use of such land essentially impossible for solar development.

The "Bottom Line" of these analyses is that the county cannot meet all its solar energy requirements on rooftops, parking lots, contaminated lands, or non-agricultural zoned land.

- **Therefore, we need not just "win-win," but "both-and," approaches to solar development… including a rational approach to having some solar on agricultural land –**
  These analyses indicate that Montgomery County will have to build half or more of the solar it requires on open land. Sierra Club strongly supports the most rapid possible development of rooftop, parking lot, and other solar, through existing incentives and requirements and with development of additional incentives and requirements as indicated.

  However, the need to transition to clean renewable energy as quickly as possible means that development of ground-based solar should not be sequential with other solar development. The urgency of climate disruption means that we need to be doing both at once.

- **Ground-based solar energy development has unique benefits**
  The average size of a farm in Montgomery County is just 117 acres.[9] Many small farmers face economic difficulty and uncertainty from factors like swings in market prices, weather, or aging farmers with younger family members uninterested in farming (average age of Montgomery County farmers is 60 years,[9] and 2/3rds of county farmers are age 55 or older[9]). For such farmers, the reliable income produced by allowing use of part of their land for commercial solar can provide important security. The general land rental price paid for solar is roughly ten times the value of the same land for growing staple crops like corn or soy – this means that a farmer with 100 acres in corn or soy could rent 10% of their land for solar, generating income equivalent to that of their whole 100 acres. This would provide economic security, and potentially risk protection that would allow them to try more environmentally positive and remunerative agriculture like organic farming or carbon-sequestering methods.

  As a development activity, solar development has important advantages over the suburban and commercial development that increasingly consumes county land –
  - Unlike the building of structures or the paving over of land, land used for solar development is not lost - there is no negative impact on the soil itself, and when the array ceases to be used, it can be removed with full restoration of the land.
  - Even while in use, solar arrays allow environmentally and agriculturally positive practices like the use of pollinator-friendly plantings between rows of panels (which has been demonstrated to improve
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[9] US Department of Agriculture, *2017 Census of Agriculture – Maryland State and County Data*; April, 2019

- productivity for surrounding lands), and in some cases co-location with other crops or even grazing animals.
- Unlike suburban development, solar development requires no new roads, sewers, services, or schools, and generates no pollution, noise, or traffic.

- **The proposed ZTA has many elements of a rational approach to solar development on the county's agricultural land**
  - The ZTA does not authorize unlimited solar development in the Agricultural Reserve, instead setting an 1,800 acre cap, just under 2% of the total 93,000 acres in the Reserve.
  - The ZTA also –
    - Provides for setbacks, fencing, and visibility screening;
    - Protects trees and landscaping (although the wording of this provision seems awkward and specifically should protect forested areas);
    - Requires that solar arrays be Pollinator-Friendly;
    - Requires removal of solar arrays that are no longer operational.

- **The amendments we propose will strengthen the balance of the ZTA**
  - A clear priority of the agricultural community, including the Maryland Farm Bureau, is the importance of minimizing impact on prime agricultural land (USDA grades 1-3). We therefore request that the ZTA be amended by adding "c. Proposed solar projects must demonstrate efforts to avoid or minimize use of USDA prime (Grades 1-3) land" to Sub-Section E ("Necessary Findings") of Section 7.3.4 ("Site Plan").
    - USDA soil maps indicate that the county, including the Agricultural Reserve, includes a substantial amount of sub-prime soil; we have attached the latest USDA soil maps[10] (yellow and orange indicate sub-prime soil areas).
  - To strengthen the protection of important environmental resources, we also request that the ZTA be amended to incorporate by specific reference the county's requirements for Erosion, Sediment Control, and Stormwater Management (Section 59.7.3.4, Chapter 19), Forest Conservation including Environmental Guidelines (Chapter 22A), and other requirements for protection of existing wooded areas, streams, stream buffers, major drainage courses, wetlands, wetland buffers, 100-year-flood-plain, environmentally sensitive areas, and existing improvements, as well as the identification of any rare, threatened, or endangered species, as "Necessary Findings" in the Site Plan review.

  We also have two suggestions to clarify and strengthen the proposed ZTA:
  - To address concerns that solar projects developed under the ZTA might not be of local benefit, the ZTA could simply specify that non-accessory solar development in the Agricultural Reserve should be limited to "Community Solar Electricity Generating Systems," which are limited by law to 2 MW or smaller size and which by definition serve only local Maryland residents connected to the electric company serving their part of the county.
  - The "Necessary Findings" should include consideration of whether land being proposed for a solar development project is owned by the farmer who uses the land, or by a separate owner, with preference being given to farmer-owned land.

[10] US Department of Agriculture, Land Capability Soil Map (Maryland); March 2012

- The rationale for this suggestion is that if land is used - usually rented - by a farmer who does not own the land, developing solar on the land may benefit the non-farmer owner, but might actually cause economic harm to the farmer her- or himself, by reducing land available to them.

With these amendments, we believe that the proposed ZTA will provide the 'win-win" balance of need for solar with agricultural protection that the county needs.

We know that the county is developing a wider Climate Action and Resilience Plan; however, that plan is not expected until a year from now. As Council Vice President Hucker has stated, "*Climate change is not only in the future — it is happening now, and we must act now to mitigate its potentially disastrous consequences*." The proposed ZTA is an appropriate and necessary step that can be taken now, without waiting another year. We therefore support the ZTA if it includes the suggested amendments.

Respectfully submitted,

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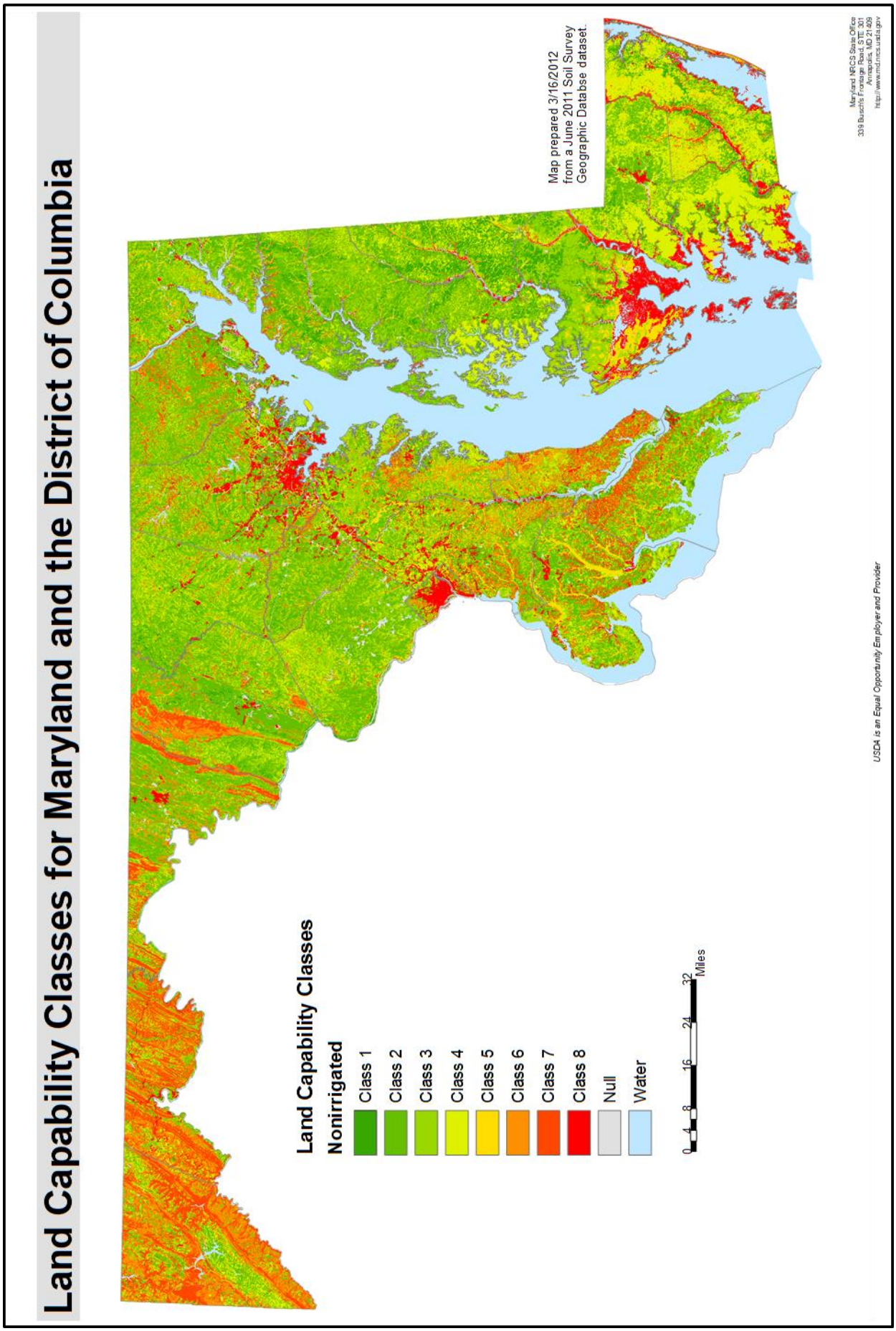
Land Capability Classes for Maryland and the District of Columbia
Map prepared 3/16/2012
from a June 2011 Soil Survey
Geographic Database dataset.
Maryland NRCS State Office
339 Busch's Frontage Road, STE 301
Annapolis, MD 21409
http://www.md.nrcs.usda.gov
USDA is an Equal Opportunity Employer and Provider
Land Capability Classes
Nonirrigated
Class 1
Class 2
Class 3
Class 4
Class 5
Class 6
Class 7
Class 8
Null
Water
0 4 8 16 24 32
Miles

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