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June 28, 2022

Ms. Jacki Byerley, Planner
Andover Planning Board
Town Office
36 Bartlett Street
Andover, MA 01810

Re: 2nd Stormwater Peer Review
1320 South Street, Andover, MA

Dear Ms. Byerley and Board Members:

The Horsley Witten Group, Inc. (HW) is pleased to provide the Andover Planning Board with this letter report summarizing our second peer review of the stormwater management for the proposed energy storage facility at 1320 South Street in Andover, Massachusetts. We understand that the project involves the construction of a 12MW, 48MWh battery storage facility on a 9.9-acre parcel. The proposed area of disturbance is currently undeveloped woodlands, and the proposal includes clearing 1.5 acres of trees. The proposed stormwater management includes two infiltration swales with check dams along the access road and an infiltration basin located on the northwest side of the facility.

The existing topography of the project area slopes towards the north to a large wetland resource area, which then flows to the Shawsheen River. The project will be located outside of the 100-foot wetland buffer as well as the 200-foot riverfront area. There is a NHESP certified vernal pool located off site and the project will be located outside of the 100-foot vernal pool buffer. NHESP has identified four (4) endangered or special concerned species occurring in the vicinity of the site. The Applicant has stated that it is working with NHESP to ensure that the project will have no impacts to these species.

A portion of the project area is located within the Federal Emergency Management Agency (FEMA) 100-year flood zone (Zone AE, Elevation 77), also defined as Bordering Land Subject to Flooding (BLSF) per Section 10.57 of the Wetlands Protection Act. Work within BLSF is within the jurisdiction of the Andover Conservation Commission.

The following additional documents and plans were received by HW in response to our May 13, 2022 initial peer review:

- Transmittal, referencing 1320 South Street, Andover, MA, prepared by Borrego Solar Systems, Inc., signed by Carli Shroyer, dated June 14, 2022 (1 page);
- Letter to Zachary Bergeron, in response to the Horsley Witten Group Review, prepared by Borrego Solar Systems, Inc., dated June 14, 2022 (8 pages);
- Operations & Maintenance Plan, for 1320 South Street, Andover, MA, prepared by Borrego Solar Systems, Inc., dated May 13, 2022 (6 pages);
- Stormwater Report, for 1320 South Street, Andover, MA, prepared by Borrego Solar Systems, Inc., dated June 14, 2022 (78 pages); and

- Site Use Permit/Plan Set for 1320 South Street, Andover, MA, prepared by Borrego Solar Systems, Inc., revised June 14, 2022, which includes:

o Title Page	T-1
o Existing Conditions Plan	C-1.0
o Tree Clearing Plan	C-2.0
o Layout and Materials Plan	C-3.0
o Grading and Erosion Control Plan	C-4.0
o Civil Details	C-5.0
o Civil Details	C-5.1

Stormwater Review

HW has reviewed the documents listed above and has the following comments concerning the stormwater management design in accordance with the Massachusetts Stormwater Handbook (MSH) dated February 2008, and the Town of Andover Stormwater Management and Erosion Control Regulations amended May 11, 2021 (Stormwater Regulations).

In accordance with Section VI.B. of the Andover Stormwater Regulations the Stormwater Management Permit and Narrative provided by an applicant shall contain sufficient information to verify compliance with the local Stormwater Bylaw and the MassDEP Stormwater Management Standards. Below are comments relating to the standards as presented in the MSH. Where the more stringent requirements of the Andover Stormwater Regulations are applicable, those comments are included.

The comments below correlate with our May 13, 2022 initial peer review. Follow up comments are provided in bold font.

1. *Standard 1 states that no new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

   a. The proposed development includes land disturbance greater than 100 feet from the wetland resource area. The Applicant has proposed drainage swales and an infiltration basin to capture and recharge the stormwater runoff from the gravel driveway as well as from the battery storage facility. The peak discharge from the swales and the infiltration basins is negligible and as designed the proposed development should not cause erosion in the wetlands or waters of the Commonwealth.

      The Applicant complies with Standard 1.

      June 28, 2022: HW has no further comment.

2. *Standard 2 requires that post-development runoff does not exceed pre-development runoff off-site.*

   a. The Applicant has noted that the proposed impervious area of the site consists of 6,739 square feet (sf) of concrete pads. A 27,585-sf gravel road is also proposed. HW frequently recommends that gravel drives be evaluated as impervious. However, the amount of traffic this drive will have suggests that it will allow stormwater to be retained in the gravel and will not sheet flow off like a hard packed gravel drive might. No action required.

June 28, 2022: HW has no further comment.

b. The Applicant has provided four subcatchments under proposed conditions. Subcatchment areas 12 and 13 include the gravel drive as well as the battery storage facility. The HydroCAD model lists brush as a surface condition within subcatchment areas 12 and 13. It is not clear from the Post-Development Watershed Plan where the brush is located within these two catchment areas. HW recommends that the Applicant clarify the use of brush.

June 28, 2022: The Applicant has decreased the brush area in the HydroCAD model for subcatchment areas 12 and 13 and explained that brush is located where tree clearing is proposed, and new grading is not occurring. The proposed area of brush is approximately 850 sf, which is minimal and will not impact the total runoff. However, HW was not able to locate the areas within subcatchment areas 12 and 13 that are not being regraded. No further action needed.

c. Section IX.E.4 of the Andover Stormwater Regulations references curve number (CN) values that the Town requires applicants to use for Pre-Construction Runoff and Post-Construction Runoff calculations. HW recommends that the Applicant verify that the CN values utilized in the HydroCAD model are consistent with Table 1 found on page 25 of the Stormwater Regulations, specifically for Newly graded pervious areas and Open space under post-construction.

June 28, 2022: The Applicant has changed some areas from brush to "pasture/grassland/range, Poor, HSG A" with a CN of 68 to match the CN value for Open space under post-construction in Table 1 of the Andover Stormwater Regulations. HW concurs with this adjustment.

d. In accordance with Section IX.E.6 of the Andover Stormwater Regulations the depth of precipitations shall be based on data provided by "NOAA Atlas 14." HW recommends that the Applicant revise the precipitation depths used in the HydroCAD model accordingly.

June 28, 2022: The Applicant states that the precipitation depths have been updated. However, it appears that the values have not been changed. HW recommends that the Applicant revise the HydroCAD model to use the more conservative depths specified by the NOAA Atlas 14 Precipitation Frequency Estimates as listed in the table below:

Reoccurrence interval	Hydrology Handbook (inches)	NOAA Atlas 14 (inches)	Applicant's SW Report (inches)
1 year	2.5	2.59	
2 year	3.4	3.21	3.15
10 year	4.7	5.08	4.83
25 year	5.6	6.24	
100 year	7.0	8.04	8.94

e. Standard engineering practice is to use 6.0 minutes as a minimum time of concentration (Tc). HW recommends that the Applicant consider revising the Tc values used for Subcatchment 12 and 13. As presented the values are considered conservative.

June 28, 2022: The Applicant has changed the Tc value for Subcatchments 12 and 13 to 6.0 minutes. HW has no further comment.

f. As modeled in the HydroCAD calculations the Applicant has not included the overflow structures as an outlet device. The peak elevations for the swales and infiltration basin do not reach the overflow structures. As designed the infiltration basin and infiltration swales discharge through infiltration only. The Applicant may choose to add the additional outflow devices to the model. No further action required.

g. The Proposed Conditions narrative in the Stormwater Report describes an infiltration ditch lined with fabric. HW recommends that the Applicant provide a detail of the infiltration ditch including the size of the ditch, the surface material, and the type of fabric proposed.

June 28, 2022: The Applicant has provided a detail for the infiltration trench. HW has no further comment.

h. HW recommends that the Applicant provide a detail of the infiltration basin including the proposed vegetation and the overflow level spreader, noting the elevation and material. Section IX.I. of the Andover Stormwater Regulations lists several design features that the Applicant should verify it complies with.

June 28, 2022: The Applicant has provided a detail of the infiltration basin and verified its compliance with Section IX.I of the Andover Stormwater Regulations. HW agrees that no forebay or sediment trap is necessary because of the low sediment load because the site will not be accessed frequently. Under IX.I.4 of the Andover Stormwater Regulations, the Applicant asks the shape requirement for the basin to be waived. HW defers the waiver request to the Planning Board and notes that this basin will not be visible from the roadway.

3. *Standard 3 requires that the annual recharge from post-development shall approximate annual recharge from pre-development conditions.*

a. The Applicant has proposed two infiltration swales and one infiltration basin. The Applicant has noted that a conservative infiltration rate of 7.0 inches per hour (iph) has been used based on the Natural Resources Conservation Service (NRCS) soil map available online. The Applicant has not conducted any test pits within the area of the infiltration practices. HW agrees that based on the NRCS soil map the soils in the area are considered hydrologic soil group (HSG) A. However, we do not agree that an infiltration rate of 7.0 iph is appropriate. In accordance with Volume 3, Chapter 1, page 10 of the MSH an in-situ permeability test is not required but the Rawls 1982 rates found on page 22 shall be used. To be conservative HW recommends that the Applicant use an infiltration rate of 2.41 iph. HW further recommends that the Applicant conduct soil test pits within the footprints of the infiltration practices to confirm the soil texture and the elevation of the Estimated Seasonal High Ground Water (ESHGW).

June 28, 2022: The Applicant has adjusted the exfiltration rate from 7 iph to 2.41 iph in the HydroCAD model and adjusted the Water Quality Depth to 1 inch runoff per Andover regulations. The Applicant has agreed to conduct soil test pits within the footprints of the infiltration practices to confirm the soil texture and the elevation of the Estimated Seasonal High Ground Water (ESHGW). The Planning Board may choose to include soil test pits as a condition of approval or require the Applicant to conduct the soil testing prior to a final decision. HW notes that the bottom of the proposed basin is designed to be set at elevation 78. The existing surface grade is approximately elevation 79 and the wetland resource area located more than 100 feet away is at approximately elevation 72. HW further notes that if the Planning Board agrees to condition that soil testing be conducted prior to construction it may choose to require that the test results be provided to the Planning Board and confirmation from a Professional Engineer be also provided stating that the design has adequate separation to groundwater and that the exfiltration rate (2.41 iph) used in the design is appropriate.

b. Volume 3, Chapter 1, page 28 of the MSH describes the need to provide a Mounding Analysis when the vertical separation from the bottom of an exfiltration system to ESHGW is less than four (4) feet *and* the recharge system is proposed to attenuate the peak discharge from a 10-year or higher 24-hour storm. HW recommends that the Applicant determine if a mounding analysis is required for the proposed development and provide one in accordance with the MSH.

June 28, 2022: The Applicant is amenable to including submission of the mounding analysis, if determined necessary after the soil testing is conducted, as a condition of approval.

c. The Applicant describes the provided recharge volume as the volume in the stone surrounding the concrete pads. HW recommends that the Applicant explain how the stormwater flows from the crushed stone into the infiltration basin. It does not appear that the available storage in the crushed stone has been modeled in HydroCAD.

June 28, 2022: HW agrees that the Applicant has provided adequate recharge volume via the infiltration basin. HW has no further comment.

d. Section IX.F of the Andover Stormwater Regulations requires applicants to illustrate that they are providing channel protection by detaining the 1-year 24-hour storm event. The Applicant has not provided the calculations. However, the HydroCAD model indicates that the Applicant is detaining the 2-year storm event. No further action required.

June 28, 2022: HW has no further comment.

4. *Standard 4 requires that the stormwater system be designed to remove 80% Total Suspended Solids (TSS) and to treat 1.0-inch of volume from the impervious area for water quality.*

a. Per Section IX.G. of the Andover Stormwater Regulations an Applicant is required to retain 1 inch of stormwater over the impervious area for pollutant removal. It appears that the Applicant has met this requirement.

June 28, 2022: HW has no further comment.

b. HW recommends that the Applicant describe how the future development will minimize sediment from entering the infiltration practices which could become clogged over the years.

June 28, 2022: The Applicant has provided an adequate description of how sediment will be minimized. HW has no further comment.

c. HW recommends that the Applicant clarify the type of equipment used at the facility and the potential for any spills to occur that could impact the groundwater.

June 28, 2022: The Applicant has clarified the type of equipment to be used at the facility and explained spill prevention practices, providing supporting details in the site plans. HW has no further comment.

5. *Standard 5 is related to projects with a Land Use of Higher Potential Pollutant Loads (LUHPPL).*

a. The site is not considered a LUHPPL, therefore Standard 5 is not applicable.

June 28, 2022: HW has no further comment.

6. *Standard 6 is related to projects with stormwater discharging into a critical area, a Zone II or an Interim Wellhead Protection Area of a public water supply.*

a. The site is not within a critical area, therefore Standard 6 is not applicable.

June 28, 2022: HW has no further comment.

7. *Standard 7 is related to projects considered Redevelopment. A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

a. The proposed project is considered a new development. Therefore, Standard 7 does not apply.

June 28, 2022: HW has no further comment.

8. *Standard 8 requires a plan to control construction related impacts including erosion, sedimentation or other pollutant sources.*

a. The Applicant has included an Erosion and Sediment Control Plan, Sheet C-4.0. It appears that a Mulch Tube has been proposed around the northern side of the infiltration basin. Details for the Mulch Tube and Silt Fence have been included on Sheet C-5.0. HW recommends that the Applicant revise the line type for the erosion control practice as it is difficult to locate and clarify which practice is proposed. HW recommends that the mulch tube and the silt fence are installed on the northern limit of work. HW further recommends that the Applicant extend the erosion control line along the west side of the limit of work to the 83 foot contour.

June 28, 2022: The Applicant has updated the erosion control plan to indicate the placement of mulch tubing around the site. The Applicant has also called out a temporary high visibility construction safety fence. It is not obvious that this fence is intended as an erosion control. HW recommends that the Applicant confirm that the Construction Safety Fence will include sedimentation control.

b. HW recommends that the Applicant add fencing around the infiltration basin and infiltration swales to prevent heavy vehicles from compacting the soil in these stormwater practices.

June 28, 2022: The Applicant has proposed temporary high visibility construction safety fencing around a portion of the infiltration basin. HW recommends that the Applicant add fencing along the southeast portion of the basin or to list in the construction sequencing that the sound barrier wall and chain link fence will be installed prior to construction of the basin.

c. HW recommends that the Applicant provide a location for soil stockpiles and provide a detail with appropriate erosion controls.

June 28, 2022: The Applicant has provided a soil stockpile area in the erosion control plan and a detail for the associated erosion controls. HW has no further comment.

d. According to the Tree Clearing Plan, the Applicant is removing 1.5 acres of trees. HW recommends that the Applicant provide a tree protection detail as well as provide construction fencing around the entire Limit of Work.

June 28, 2022: The Applicant has provided a tree protection fencing detail and added a high visibility safety fence along the entire Limit of Work. HW has no further comment.

e. The proposed project requires land disturbance of greater than 1 acre. Therefore, a Stormwater Pollution Prevention Plan (SWPPP) per the EPA NPDES Construction General Permit will be required. HW recommends that the Applicant provide a copy of the SWPPP to the Town a minimum of 14 days prior to land disturbance.

June 28, 2022: The Applicant is amenable to including submission of the SWPPP to the Town as a condition of approval.

9. *Standard 9 requires a Long-Term Operation and Maintenance (O & M) Plan be provided.*

a. The Applicant has provided a Long-Term Pollution Prevention Plan in the Stormwater Report as required. HW recommends that the document become a standalone document to be signed by the property owner prior to land disturbance.

June 28, 2022: The Applicant has provided the O&M Plan as a standalone document to be signed by the final system owner prior to land disturbance. HW has no further comment.

b. The Applicant has noted in the O&M Plan that the stormwater management system owners, parties responsible for operation & maintenance, and an estimated operations & maintenance budget are to be determined (TBD). HW recommends that the Applicant provide a final O&M Plan with these items included prior to land disturbance.

June 28, 2022: The Applicant is amenable to including submission of the final signed O&M Plan to the Town as a condition of approval.

c. The Applicant has provided maintenance tasks for the Infiltration Basin. HW recommends that the Applicant add that inspection is required "after every major storm during the first 3 months of operation" per Volume 2, Chapter 2, Page 87 of the MSH.

June 28, 2022: The Applicant has provided maintenance tasks for the Infiltration Basin and included inspection requirements per the MSH. HW has no further comment.

d. HW recommends that the Applicant include the maintenance of check dams and infiltration trenches in the stormwater management maintenance section of the O&M Plan.

June 28, 2022: The Applicant has included the maintenance of check dams and infiltration trenches in the O&M Plan. HW has no further comment.

e. HW recommends that the Applicant provide a simple plan that is drawn to scale and shows the location of all stormwater practices requiring inspections and long-term maintenance.

June 28, 2022: The Applicant has provided a simple plan highlighting the stormwater practices. HW has no further comment.

f. The Applicant includes culverts under the stormwater management maintenance section of the O&M. HW recommends that the Applicant indicate where this practice is being used at this site.

June 28, 2022: The Applicant does not propose culverts onsite and has removed any mention of culverts from the O&M. HW has no further comment.

10. Standard 10 requires an Illicit Discharge Compliance Statement to be provided.

a. HW recommends that a signed Illicit Discharge Compliance Statement be provided to the Town of Andover prior to the discharge of any stormwater to post-construction best management practices (BMPs).

June 28, 2022: The Applicant is amenable to including submission of a signed Illicit Discharge Compliance Statement to the Town as a condition of approval.

11. Compensatory Flood Storage.

a. It appears that the Applicant is filling a small area of the 100-year flood plain along the west corner of the infiltration basin. HW recommends that the Applicant demonstrate that it has provided adequate compensatory storage to mitigate for the volume filled or consider relocating the basin to avoid this filling.

June 28, 2022: The Applicant has shifted the infiltration basin to avoid filling in the 100-year flood plain. HW has no further comment.

Conclusions

HW recommends that the Planning Board determine if the soil testing may be a condition of approval and require the Applicant to provide a written response to address the few outstanding comments as part of the permitting review process. The Applicant is advised that provision of these comments does not relieve him/her of the responsibility to comply with all Town of Andover Codes and By-Laws, Commonwealth of Massachusetts laws, and federal regulations as applicable to this project. Please contact Janet Bernardo at 857-263-8193 or at jbernardo@horsleywitten.com if you have any questions regarding these comments.

Sincerely,

HORSLEY WITTEN GROUP, INC.

Janet Carter Bernardo, P.E.
Associate Principal

Veronica Seward-Aponte, E.I.T.
Environmental Engineer

CC: Andover Conservation Commission