GCG ASSOCIATES, INC.

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June 6, 2018

Ms. Sheila Page, Town Planner
101 Main Street
Town of Ashland
Ashland, MA 01721

RE: Ashland Solar
Lot 138 off Megunko Road and MBTA Roadway

Dear Ms. Page:

GCG Associates, Inc. has reviewed the following information for Asland Solar located at Lot 138 off Megunko Road and MBTA Roadway in Ashland, MA.

Documents: Site Plan Review Report, dated May 1, 2018; Stormwater Permit Report, dated May 1, 2018, Notice of Intend Report, dated May 1, 2018. Reports prepared by: Allen & Major Associates, Inc., Applicant: Ashland Solar LLC.

Plan References: "Site Development Plans for Ashland Solar, Lot 138 off Megunko Road & MBTA Roadway, Ashland, Massachusetts," Prepared by: Allen & Major Associates, Inc., Dated: 05/01/2018. Sheet index as follows:

	Cover Sheet
C-001	Notes and Abbreviations
C-101	Erosion Control Plan
C-102	Layout and Materials Plan
C-103-C-105	Grading & Drainage Plan
C-501-C502	Details
C-601	Zoning Diagram
S-301-S-302	Rack Section
S-501-S-502	Details
E-100-E-101	Electrical Plan

GCG has performed a site plan review as required by Ashland Zoning under Chapter 282-9.4. The proposed Development also requires a Stormwater Management Permit under Chapter 343 and Conservation Commission Notice of Intent under 310 CMR 10.00 Wetlands Protection. The application and plans are prepared and submitted by Allen & Major Associates, Inc. on behalf of Ashland Solar, LLC. The

The applicant, Ashland Solar, LLC, seeks to install a ground mounted photovoltaic array at the property located at Tax Map 13, Lot 138 off Megunko Road and MBTA Roadway in Ashland, MA. This lot is owned by Megunko Transit District, LLC. The subject property is approximately 123.3+/- AC with access through Megunko Road and MBTA Roadway.

Based upon our review of the above information, we offer the following comments with respect to compliance with Town of Ashland Zoning Bylaws Chapter 343 Stormwater Management and the Massachusetts Stormwater Management Handbook. The numerical section of the regulations is referenced at the beginning of each comment unless it is a general comment.

GENERAL COMMENTS:

1. The Notice of Intent (NOI) report reference to an Operation and Maintenance (O&M) Plan in Appendix B, which is missing in the report.

2. There is an Operation and Maintenance Plan in the Stormwater Permit Report Appendix B. The O&M plan stated that "The Operation & Maintenance (O&M) plan for the solar array is explained below. It is not intended that the protocol listed here will replace the current O&M activities for the landfill, rather include additional O&M activities and procedures to meet the needs of the solar array." And this O&M plan does not specify any drainage system operation and maintenance.

3. There is a Section 5-Stormwater Management System Maintenance in both reports stated that "Allen & Major Associates, Inc. (A&M) has prepared the following Operation and Maintenance plan for the proposed stormwater management system. This plan focuses on post construction maintenance of the on-site drainage system. Operation and Maintenance (O&M) practices discussed below are recommendations made by the Design Engineer based on available reference material on Best Management Practices (BMP's) and experience. The property owner is responsible for implementation of the plan, and is encouraged to revise / supplement this plan accordingly based on actual site conditions." Section 5 also listed Proponent as Ashland Solar, LLC. with address at 88 Black Falcon Avenue, Center Lobby Suite 342, Boston, MA. Please clarify the responsible party of the O&M system.

4. A Stormwater Management Operation and Maintenance Plan shall be included in the NOI and the Stormwater Permit Application and identify the name of the Stormwater Management System Owner, the party responsible for operation and maintenance of the system. An Owner and/or Operator signature block and an estimated operation and maintenance budget should be included in the O&M plan. A sample operation and maintenance Log Form should be included in the package to meet the Standard 9 of the Stormwater Management requirements.

5. The Solar Array 1 is proposed on top of the capped Nyanza Superfund site, Section 2.1-Site Location and Description of the reports stated that "The site drains in all directions and is intercepted by drainage swales, sediment ponds and/or existing wetlands that isolated the cap stormwater from surrounding areas." Assuming the current property owner "Megunko Transit District, LLC." is the operator of the existing Stormwater Management Operation and Maintenance (O&M) plan. If the report is intended to have the property owner responsible for the O&M of the entire site including the proposed

solar array drainage system, the O&M plan should be updated to include the new system.

6. Section 6- Long-Term Pollution Prevention, this section seems more appropriate for during construction period. Hazardous materials and waste shall not be allowed for long term storage on site without a proper permit.

7. Illicit Discharge Statement shall be signed by the Owner of the property.

8. The proposed project requires a NPDES permit and SWPPP plan prior to construction.

Section 343 Stormwater Management

Plan Set

Note: Stormwater Management related comments only.

343-7.6.10.11 Plan Sheet C-101 - Portion of the Solar Array 1 drains north and northwestward to the existing Stormwater Management Basin, additional erosion control should be installed at the northerly gravel drive near the two swales drains to the basin.

Plan Sheet S-502 – The Ballast Construction Schedule is not showing the sizes of the concrete ballast, the dimensions and weight of the ballast should be provided for analysis for excessive pressure on top of the cap and the equipment required to install the ballasts. Erosion control should be installed accordingly. Use construction mats to evenly distribute the load and protecting the cap as necessary.

General Comment: Plan C-104 – Plan shows proposed on-grade cable trays along the east side of the solar array 1. On-Grade Cable Trays details should be included in the plan set to assure no restriction to the surface drainage runoff.

General Comment: Plan C-105 – The plan calls for installation of a plunge pool, based on the soil testing and boring logs near the location, the soils found are sand and gravel with high exfiltration rate. Plunge Pool details should be provided. Pool bottom material should be specified to keep the pooling function. An emergency overflow should be included to direct overflow to the infiltration basin with erosion protection.

The plan calls for approximately three feet of cut for the proposed basin bottom. Additional soil test pits should be performed in the infiltration basin location to verify the separation to the bedrock and/or seasonal high groundwater table.

The pipe slope from the plunge pool to the infiltration basin should be 0.57%; the pipe slope from the swale to the infiltration basin should be 0.89% based on the proposed inverts' elevation and pipe lengths.

The drainage swale should be sized with the intended storm event, overflow should be directed to the infiltration basin. Earth berm along the east side of the drainage swale should be widened to prevent washout.

Permanent stone check dam at the swale details should be provided.

General Comment: Plan C-501 – Detail #4 shows Proposed Pavement Section details, please identify the proposed pavement location on the plan set and adjust the drainage calculations accordingly.

General Comment: Plan C-502 – Detail #4 Typical Infiltration Basin Cross Section, the basin should be seeded.

On-Grade cable trays details should be included.

Permanent stone check dam details should be included.

Plunge Pool details should be included.

General Comment: Plan S-502 – the Ballast Construction Schedule is not completed. The information should be provided to estimate and limit the net area of concrete ballast and weights on top of the cap. GCG assumes the concrete ballasts are similar to the sizes shown on the report's pictures from other sites. Considering the concrete ballast is set on top of crushed stone pad as shown on the plan sheet S-302, which should not cause any major concerns with the amount of impervious ballast surface installed on site.

The proposed infiltration basin is located at the south side of the Nyanza Superfund Site.

Massachusetts Stormwater Handbook (MSH)

MSH Vol.1 Chapter 1 Quote "MassDEP also recognizes that on some sites, there is a risk that infiltrating the required recharge volume may cause or contribute to groundwater contamination. Consequently, MassDEP requires infiltration only to the maximum extent practicable on the following sites: sites where recharge is proposed at or adjacent to an area classified as contaminated, sites where contamination has been capped in place; sites that have an Activity and Use Limitation (AUL) that precludes inducing runoff to the groundwater, pursuant to MGL Chapter 21E and the Massachusetts Contingency Plan 310 CMR 40.0000; sites that are the location of a solid waste landfill as defined in 310 CMR 19.000; and sites where groundwater from the recharge location flows directly toward a solid waste landfill or 21E site." MassDEP requires soil test pits be performed at the infiltration basin location, the area should be evaluated during the soil testings to assure suitable for infiltration facility.

MSH Vol.3 Chapter 1 Mounding analysis shall be provided when recharge is proposed at or adjacent to a site classified as contaminated, was capped in place, or

has an Activity and Use Limitation (AUL) that precludes inducing runoff to the groundwater, pursuant to MGL Chapter 21E and the Massachusetts Contingency Plan 310 CMR 40.0000; or is a solid waste landfill pursuant to 310 CMR 19.000; or groundwater from the recharge location flows directly toward a solid waste landfill or 21E site. In this case, the mounding analysis must determine whether infiltration of the Required Recharge Volume will cause or contribute to groundwater contamination.

Drainage Calculations

General Comment:

1. The HydroCAD calculations should consider increased the time span to evaluate the full effect of the infiltration system.

2. Sub-catchment 3aS flow length should be verified, the 148 feet length appears to be short for the sub-catchment area of 2.305 acres.

3. Please verify the "Fair" Grass cover used on sub-catchments 3cS and 3dS. If the surface cover underneath solar array #1 is considered "Good" Grass cover (sub-catchments 1S and 2S). We would expect that both arrays' surface cover be treated the same with similar conditions. These changes may address the increased peak runoff during the post-development 100-year storm event.

4. Pond 3P should considering using the pond bottom surface area for exfiltration only, as MSH recommends to use the pond bottom area only to calculate draw down time.

5. Plunge pool outlet pipe entrance and pipe capacity analysis should be provided to show plunge pool peak elevation to assure no overtopping.

6. Drainage swale flow capacity, and the 15-inch diameter outlet pipe entrance and pipe capacity should be analysis to assure enough capacity to handle the design flow. Freeboard for the drainage swale should be provided.

343-8.1.4 Section 3.3 – proposed Stormwater Patterns, table 3.3.1 shows peak flow increase of 0.56 cfs during the 100-year storm event. See comment #3 above, the adjustment may address the peak increase situations. If the peak flow increase remains during the 100-year storm event with using "Good" Grass cover in sub-catchments 3cS and 3dS, an analysis for the wetland downstream 24-inch diameter culvert and the two 32"x22" culverts should be provided to demonstrate no increased flooding impacts off-site during the extreme storm events.

282-9.4.9 Section 3.3 – proposed Stormwater Patterns, table 3.3.2 shows slight increase of 0.010 ac-ft runoff volume during the 10-year storm event. The

comments stated in comment #2 above may resolve the increased volume issues. However, the increased volume is relative small in comparison with the overall site area and should have no adverse impact to the site.

A Stormwater Management Operation and Maintenance (O&M) Plan is required per SMH Standard 8.

The Stormwater Management O&M plan should include all the items covered in Section 5.0- Stormwater Management System Maintenance of the reports.

GCG recommends adding to section 2 of the O&M Plan the following items:

Section 2.2 - Grass swales should be mowed as necessary and grass height should not exceed 6 inches and remove accumulated sediments and debris at least once a year;
Section 2.3 - Stone check dams sediment and debris should be removed at least once a year;
Section 2.4 – Infiltration basin shall be inspected after every major storm during first 3 months of operation;
Special attention should be called out on the plan that the cap area should be mowed and maintained according to the existing superfund site operation and maintenance plan, any woody vegetation shall be removed to avoid damage to the cap;
O&M plan should incorporate with the existing Stormwater Management O& M Plan for the entire site.
Owner/Operator signature block be included in the O&M plan;
O&M cost estimate should be provided;
Inspection Log sample should be included in the plan.

If you have any questions regarding this matter, please contact our office.

Respectfully Submitted,
GCG Associates

Michael J. Carter

Michael J. Carter, P.E.
Project Manager