

Date September 23, 2021
To Wrentham Board of Health
From Mark S. Bartlett, PE
Thomas C. Houston, PE, AICP
Project NextGrid Inc. Solar Array – 6.5 Megawatt DC Ground-Mounted Solar
Photovoltaic Array, 80 Washington St., Norfolk County, Wrentham, MA
Subject Stormwater Review of Site Plans & Stormwater Management Report

Professional Services Corporation, PC (PSC) has reviewed the Site Plans and Stormwater Management Report for the above noted project on behalf of the Wrentham Board of Health, Planning Board, and Conservation Commission.

NextGrid Inc. (Applicant) proposes to develop a 28.13-acre parcel as a 6.5 Megawatt DC Ground-Mounted Solar Photovoltaic Array, with access through property frontage at 80 Washington Street, Wrentham, MA (the Site). The Assessor Parcel involved is Map P-10, Block 1, Parcel 1, and it is owned by GM Vachon Realty LLC. The Site is an undeveloped wooded lot that is bounded by Washington Street to the south and undeveloped land to the east, north and west; and it is located in the Town's Commercial Route 1 North (C-1N) zoning district. The Site is located within the Aquifer Protection District (Article 5.5.c) and Watershed Protection District (Article 5.3). Wetlands are located west and east of the Site. A FEMA 100-year flood zone is located further west of (but not on) the Site and the flood zone is associated with wetlands surrounding Crocker Pond to the south and streams that are tributary to Crocker Pond. The Site ultimately drains toward Crocker Pond. The site plans and stormwater report were filed with the Board of Health for review under the Wrentham Stormwater Regulations.

The Project will involve the construction of a ground mounted photovoltaic solar array and Site infrastructure that will include a gravel access road, utility poles, ground mounted equipment, concrete pads, chain link fencing, and stormwater management features. The array will be accessed by a gravel driveway from Washington Street, and this gravel drive will extend to the northerly extent of the Site. The total length of the gravel access drive is about 2,150-feet. The first 285± feet of access drive from Washington Street will be 20-feet wide, and the remaining length will be 12-feet wide. Electric power generated by the solar array will connect to the



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National Grid network via an existing utility pole on Washington Street. The Site electrical connection to the Washington Street line will require six private utility poles along the gravel driveway into the Site. It appears that no other utility services will be brought to the Site.

The plans indicate that 22.26± acres (about 79.1%) of the 28.13-acre Site will be altered for the solar field development. The area to be developed is wooded or wetland area and it has no impervious area. The proposed watershed data indicate that the project will result in a minor increase in disconnected impervious area¹ of 1,914-square feet (0.044-acres) which is about 0.2% of the area being developed. Effectively, from a stormwater management perspective, there will be no relevant impervious area. All Site development will occur outside of the 50-foot buffer zone to wetlands. All solar arrays and associated equipment will be located outside of the 100-foot wetland buffer zone, however some re-grading and some portions of the 3 stormwater detention basins will be within the 100-foot buffer zone.

Stormwater from the re-graded solar panel fields, and gravel road will be collected and managed through a three drainage channels that lead to three detention basins: Drainage Channel 10PA will drain to Detention Basin 10PA, Drainage Channel 20PA will drain to Detention Basin 20PA, and Drainage Channel 10PB will drain to Detention Basin 10PB. In addition, the hillside area, with 25% slope, east of Detention Basin 10PB, is proposed to flow across the proposed gravel road and directly into the basin (see later comment on this); and Detention Basin 20PA will receive some minor direct flow from a hillside with modest 4% slope on the southeast side. Infiltration systems are not proposed. The basins are designed as detention basins and there are no credits for infiltration within these basins.

As part of obtaining a Certificate of Approval from the Board of Health under the Board's "Regulation for Storm Water and Runoff Management (April 1991, amended March 2009)" (RSRM), the project must comply with the latest version of the Massachusetts Stormwater Handbook (SWH)², and as a solar project, it must comply with requirements stated in the Massachusetts DEP Wetlands Program Policy 17-1: Photovoltaic System Solar Array Review. The project will also require Site Plan Approval from the Planning Board, and an Order of Conditions from the Conservation Commission per the Town of Wrentham Wetland Protection Bylaw (Art.7.31 of Wrentham General Bylaws), and a Massachusetts DEP Order of Conditions (MGL c. 30, §§ 61 through 62H). Therefore, this review of Project stormwater management is for consideration by the Board of Health, Planning Board, and Conservation Commission.

¹ New impervious areas will be minor and disconnected, as associated with the concrete pads that will support electrical system equipment and cabinets for inverters, meters, transformers, switches and battery systems.

² Included by reference in sections 3.a and 3.h of the Regulations for Stormwater and Runoff Management



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The Site Plans and Stormwater Management Report were prepared by Fuss & O'Neil of Quincy, MA, and the Site was surveyed by Peter Nolan & Associates of Newton, MA.

We offer the following comments for consideration.

SUBMITTAL

- A. "Site Plan Application Report, Washington Street Solar Array", prepared by Fuss & O'Neil for NextGrid Inc., dated August 23, 2021. This report included 10 appendices.
- B. "Permitting Plans, Washington Street Solar Array, 80 Washington St., Wrentham, MA," prepared by Fuss & O'Neil for NextGrid Inc., dated August 23, 2021, consisting of seventeen 24" x 36" drawings.
- C. Stormwater Management Report for Washington Street Solar Array, prepared by Fuss & O'Neil for NextGrid Inc., dated August 23, 2021, consisting of fourteen pages, four figures, and nine appendices.

REFERENCE

- A. "Regulation for Storm Water and Runoff Management (April 1991)" (RSRM) voted March 15, 1991, amended March 23, 2009, Wrentham Board of Health.
- B. "Stormwater Handbook" (SWH) Massachusetts Department of Environmental Protection.
- C. Massachusetts DEP Wetlands Program Policy 17-1: Photovoltaic System Solar Array Review

REGULATIONS FOR STORM WATER AND RUNOFF MANAGEMENT

Compliance of the project submittals with the Wrentham Board of Health's "Regulation for Stormwater and Runoff Management" (RSRM) is summarized hereinafter.

Executive Summary

The RSRM states six general goals for submitted stormwater management designs. As a form of executive summary, each of these goals is restated below along with our general comments on the degree to which the Project complies with the goals.

- A. ***Reproduce, as nearly as possible, the hydrological conditions in the ground and surface waters prior to development.*** Although ground cover will change for the proposed solar field development, the Applicant has met this standard because post-development



hydrologic conditions will closely approximate pre-development conditions through maintenance of vegetative cover and through proposed detention basins that will result in post-development peak flows being less than or equal to existing condition peak flows. Although the three detention basins are not designed as infiltration facilities, we believe that there will be some unaccounted for infiltration within these basins, and as noted, the maintenance of natural ground cover on re-graded areas including under the solar panels will provide suitable hydrologic equivalency to pre-existing conditions.

- B. Reduce storm water pollution to the "Maximum Extent Possible" (MEP) using Best Management Practices (BMPs).** The Applicant's erosion control submittals will meet this goal with the proposed controls adhered to during and after construction. However, we recommend an evaluation of employing additional drainage channels to help prevent erosion in three of the proposed basin areas, and we offer other recommendations related to erosion control.
- C. Have an acceptable future maintenance burden.** The Applicant's submittals, including the operation and maintenance plan, demonstrate that the development will meet this goal.
- D. Have a neutral effect on the natural and human environment.** The Applicant's submittals demonstrate that the development will meet this goal.
- E. Be appropriate for the site, given physical restraints.** The development meets this goal.
- F. Provide a sufficient level of health and environmental protection during the construction phase.** The Applicant's submittals currently appear to meet this goal subject to some recommended improvements noted below.

In short, to close to this executive summary, the proposed project will meet the RSRM goals with the concerns raised in this review properly addressed. Specific numbered comments follow.

Comments on Acceptable Stormwater Management Plan requirements^{3,4}

The Applicant's Stormwater Management Report, Section 7, provides a summary of how the Project conforms to the town's *Regulations for Stormwater and Runoff Management* (RSRM). We concur with their summary, however we find that the following aspects of stormwater

³ See page 2 of the Regulations for Stormwater and Runoff Management

⁴ See pages 5 through 8 in Section II of the Regulations for Stormwater and Runoff Management



management need to be addressed in order to fully meet the relevant requirements of the RSMR checklist:

An RSRM checklist item General Basin Design Requirements requires that water depth in detention basins should not exceed 3-feet.

1. The Applicant should address the following Detention Basins' non-compliance with this checklist item and either modify the design, or request a waiver of the rule and provide justification for the waiver:
 - a. The depth of Detention Basin 10PA exceeds the 3-ft limit for all evaluated storm events: 2-yr (3.14'), 10-yr (4.35'), 50-yr (5.24') and 100-year (5.87').
 - b. The depth of Detention Basin 10PB exceeds the 3-ft limit for the 50-yr (3.54') and 100-yr (3.8').

An RSRM checklist item states: *The stormwater management system shall have an operation and maintenance plan satisfactory to the Board of Health in accordance with Mass DEP guidelines and good engineering practice to ensure that systems function as designed. For stormwater facilities that are not publicly owned or maintained, the Board of Health shall require that an agreement shall be executed, subject to the approval of the Board of Health, for perpetual maintenance and operation of the stormwater system in order to guarantee the regular maintenance, repair, and replacement of any or all components as necessary.*

Subject to revision per recommendations in Comments 14 through 20 below, the Applicant's submitted Operation & Maintenance Plan will prove to be satisfactory for the proposed stormwater BMPs; please note below:

2. An operations & maintenance agreement between the Board of Health and the Site Owner will need to be executed.

MASSACHUSETTS STORMWATER MANAGEMENT STANDARDS

The Applicant's Stormwater Management Report includes an evaluation of compliance with the Stormwater Management Standards as presented in the Massachusetts Stormwater Handbook (SWH). The Project's compliance with Stormwater Management Standards are addressed for each standard below:

Standard 1: No New Untreated Discharges or Erosion to Wetlands. Compliance with this standard has been demonstrated by the proposed design. However, we have concerns regarding



possible erosion of the access road due to crossing stormflow from the large, relatively steep upgradient hills:

3. Consider additional drainage channel(s) on the upgradient side of the gravel access road to intercept drainage flow from the adjacent hills that could cause erosive breaks in the road. Provide culvert outlets from such drainage channel, below the road, to release stormflows into the adjacent detention basin(s). There are 3 locations of concern:
 - a. At the north end of the Site [Sheet CS-103], where the access road terminates and slopes are about 10% - hills north and east of the access road will direct stormflow across and along the 10% grade access road into Detention Basin 10PB. We recommend that this area should be managed with armored channel(s);
 - b. At the substantial hill with 25% slopes that is east of the access road along Detention Basins 10PB and 10PA [Sheets CS-103 and CS-102], we recommend that runoff from this hill should be intercepted by armored upgradient channel(s) to prevent erosion as stormwater meets and runs across the road; and,
 - c. Where the access road turns north after heading west [Sheets CS-101 and CS-102], there are steep 10% road grades and substantial hill with 25% slopes east of the access road leading to Detention Basin 10PA. We recommend that the armored drainage channel that is proposed downgradient of the access road be relocated to the upgradient side of the access road to intercept stormflow from the hill and prevent erosion as stormwater meets and runs across the road. Also, as part of this, we recommend that this portion of access road be superelevated toward the east so that road runoff flows into upgradient drainage channel, thus protecting the slope west of the access road from receiving any flow from the top.

Standard 2: Peak Rate Attenuation. Compliance with this standard has been demonstrated. The Site plans and stormwater report adequately describe proposed detention basin performance.

4. However, we recommend that the Applicant submit calculations to prove adequate drawdown time for each of the three detention basins, to ensure that capacity will be available for back to back storm events.

Standard 3: Stormwater Recharge. The intent of Standard 3 is to ensure that the infiltration volume of precipitation into the ground under post-development conditions is at least as much as the infiltration volume under pre-development conditions. We concur with the Applicant - the project submittals, result in compliance with this standard.



Standard 4: Water Quality. We concur with the Applicant's position that impervious surfaces requiring water quality treatment are not proposed.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs). This standard is not applicable for the Project Site.

Standard 6: Critical Areas. Although the Site is located in the vicinity of a Class A Surface Water⁵ we concur with the Applicant's position that impervious surfaces requiring water quality treatment are not proposed.

Standard 7: Redevelopment Project. This standard is not applicable for the Project Site.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls: The Applicant has provided plans and instructions for controlling erosion and sedimentation that generally comply with this standard. However, because the Site Plans (Sheets CP-101, CP-102 and CP-103) call for use of the 3 detention basins as "temporary siltation traps" during Site construction, we recommend that the Applicant add a note to the Site Plans to protect the detention basin areas:

5. The Applicant should add a note to the Site Preparation Plans (Sheets CP-101, CP-102 and CP-103) to specify procedures to be followed during construction of detention basin areas that may be used for temporary drainage management and sediment traps. For example, one approach is to delay excavation to finished grade until after most site construction is completed. Then, excavation to final basin grades will also remove siltation that may have accumulated during construction.

There are a few other revisions that we recommend for Erosion & Sedimentation Control:

6. Add notes for installing erosion control blankets to stabilize newly exposed slopes along the access road, at the three detention basins, and at the drainage channels as soon as the grading is completed. In areas to be seeded, it will be preferable for the erosion control matting to include grass seed and fertilizer.
7. Add notes to discuss the procedures to check and clean the Temporary Sediment Traps, stone check dams, and inlet protections that are noted on Sheets CP-1013, CP-102 and CP-103.
8. Because the project will disturb one or more acres, an eNOI must be filed with the USEPA and a Stormwater Pollution Prevention Plan (SWPPP) must be prepared by the Applicant.

⁵ See definition in 314 CMR 4.00



9. Add an Erosion Control Blanket Installation detail to one of the detail sheets.
10. Provide a detail for areas where drainage channels transition from grass to stone lined channel (e.g., end of Drainage Channels 10PB and 20PA, and sides of stone channels).

The Stormwater Management Report includes hydraulic calculations to demonstrate adequate capacity of the proposed drainage channels, however additional information to clarify meaning, and an analysis of erosion control protection of these channels is missing:

11. Provide a legend of the measurement units that apply to the parameters listed in the three drainage channel hydraulic analyses reports.
12. Provide calculations to demonstrate that proposed riprap lining of the channels will be adequate for preventing erosion from the flow rates and velocities that are reported in the above noted hydraulic calculations.
13. The Drainage Channel detail (Sheet CD-503) states that “Riprap Gradation is Specified on Plans”, but riprap gradation for the channels is not provided. Please provide the riprap / stone sizes that are required for each drainage channel by a revision to the Site plans.

Standard 9: Operation and Maintenance Plan. An *Operation and Maintenance Plan* has been submitted as part of the Site Plan Application Report, and a *Long Term Operation and Maintenance Plan* has been submitted as part of the Stormwater Management Report. These two plans should be amended as follows:

14. The O&M Plan Section 7.0 – Stormwater and Erosion Control Facilities should be revised to remove sub-paragraphs (b) and (c) as they do not apply to the proposed project. Also remove the last sentence of subparagraph (e) which does not apply to the project.
15. The O&M Plan Section 7.0 – Stormwater and Erosion Control Facilities should include a sub-paragraph that reads “Inspect all drainage channels, both riprap and grass lined, after every major storm event for the first few months after construction to ensure proper stabilization, and then quarterly thereafter.”
16. The O&M Plan Section 7.0 – Stormwater and Erosion Control Facilities should include a sub-paragraph that reads “Inspect all areas of the gravel access driveway, particularly the steeper sections, and all 25% field slope areas after every major storm event for the first few months after completion of Site construction to ensure proper stabilization, and then quarterly thereafter. Look for wash-outs, settlement, or formation of eroded channels. Refill, repair, and recompact any areas that are eroded or not stabilized.”



17. The *Long Term Operation and Maintenance Plan* should include a section on maintenance of the gravel access driveway, similar to that provided for the drainage channels, because the access drive plays an important part in grading of the stormwater conveyance system, and because it is a Site element that could be subject to erosion over time.
18. The *Master Checklist* (schedule) within the *Long Term Operation and Maintenance Plan* should include maintenance and inspection for the access road and for 25% slope fields.
19. The *Long Term Operation and Maintenance Plan*, Appendix A, should include revised inspection forms that are project specific for each of the three detention basins (e.g., the existing forms for infiltration basins appear to be carried over from another project), and provide forms for each of the drainage channels, for the gravel access driveway, and for the outlet control structures at each of the detention facilities.
20. The *Long Term Operation and Maintenance Plan* refers to a “snow management plan” as having been developed. This is missing, and should be provided, and include a plan or figure that indicates the proposed area(s) for snow storage, and provide supporting calculations on snow accumulation volume and adequacy of the proposed storage areas. Detention basins and drainage channels should not be used or blocked.

Standard 10: Prohibition of Illicit Discharges. An Illicit Discharge Compliance Statement has not been submitted; however, this standard will be met upon submission.

21. The Applicant should submit a signed Illicit Discharge Compliance Statement as discussed in the Massachusetts SWH.

OTHER COMMENTS ON APPLICANT SUBMITTALS

The Community and Environmental Assessment Letter, and the completed Application for Special Permit/Site Plan Approval, indicate that soils will not be removed from the Site. However, the Cut & Fill Analysis Plan (Sheet CS-200) indicates there will be 2,980 cubic yards of net cut soils.

22. How will this excess (cut) soil be managed? It appears that an Earth Removal Permit may be required in accordance with the EARTH REMOVAL BYLAWS - Wrentham General Bylaw Art. 7.11 & Wrentham Zoning Bylaw Art. 14.
23. Explain design provisions within the proposed solar panels that will assure that runoff occurs from individual panels and not from the entire length of a solar array.
24. The maximum access road grade shown on the Site Plans appears to be 10-percent, however the Gravel Access Road detail on Sheet CD-503 indicates “Maximum Road Grade Shall be 8%”. This difference should be explained and reconciled.



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25. Explain the source of water that will be used for dust control during construction, for the proposed washing of solar panels (as discussed in the Equipment Maintenance section of the Operations & Maintenance Plan), and for the fire suppression system that is noted in Appendix D of the Site Plan Application Report.
26. Please confirm if the proposed Construction Sequence listed on Sheet GI-102 will apply to work being performed for Site improvements construction in one large 22-acre phase. Site erosion control will be particularly challenging for an open site of this size if this is the case. However, if the intent is for Site development work to be performed in phases (e.g., one solar array phase for each detention basin tributary area), then please provide a plan indicating the areas, and sizes of areas that will be disturbed for each phase, and explain the sequence of phased construction (including steps for securing a completed phase before moving on to the next) in addition to the aforementioned Construction Sequence.