April 4, 2022
Ron Wolanski, AICP / Director of Planning
Town of Middletown
350 East Main Rd
Middletown, RI 02842

RE: GD Middletown West Main I, LLC
2.50 MW AC
1747 West Main Road
Middletown, RI 02842

Dear Mr. Wolanski,

On behalf of the applicant, GD Middletown West Main, LLC, Green Development, LLC has prepared this narrative in support of the Development Plan Submission to the Town of Middletown for review by the Planning Board. This narrative defines the existing conditions of the site and the proposed solar energy project.

Existing Conditions:

The property in question is listed by the Town of Middletown Tax Assessor as Plat 111, Lot 9A and is situated east of West Main Rd, with a listed street address of 1747 West Main Road. The site is bounded by West Main Road to the west, and an adjacent industry property (AP 11 Lot 8), residential property to the north and south, and a National Grid transmission line abutting the site to the east.

The approximate lot area is 12.67 acres based on the property record card information available on the Middletown, Rhode Island online GIS system and an administrative subdivision recorded as map D-348. The solar array is located substantially within the existing cleared area onsite. The cleared area is currently utilized as an open field. The site is gently rolling predominantly to the south and west toward an existing wooded swamp and 50' perimeter wetland on the site. The site lies within a Surface Water Protection Area (Town), Water Protection District 1 (Town), and Water Protection District 2 (Town).

The Rhode Island Soil Survey (2016) depicts the property as being comprised of four (4) different soil types:

SOIL NAME	HSG	DESCRIPTION
NeB*	C	NEWPORT SILT LOAM, 3 TO 8 PERCENT SLOPES
PmA*	C	PITTSTOWN SILT LOAM, 0 TO 3 PERCENT SLOPES
PmB*	C	PITTSTOWN SILT LOAM, 3 TO 8 PERCENT SLOPES
Se*	D	STISSING SILT LOAM

*PRIME AGRICULTURAL SOILS

Note that no removal of topsoil or prime agricultural soil is proposed as part of this project. Any disturbance associated with utility trenches or the access driveway will remain and be re-used onsite.

Local Land-Use Restrictions:

The site is zoned as LI (Light Industrial). The minimum lot size for development within this district is one (1) acre. The zoning district requires a front yard setback of 25 feet, a side yard setback of 25 feet and a rear yard setback of 25 feet are required of all development within this designation. The following chart has been prepared to depict the Town's setbacks for the LI zoning district. These setbacks have been incorporated in the plan set for preliminary planning purposes.

EXISTING ZONE (SECTION 603)	ZONE L1 (INDUSTRIAL DISTRICT)
MINIMUM LOT AREA:	40,000 SF
MINIMUM FRONTAGE:	150'
MINIMUM FRONT YARD:	10'
MINIMUM FRONT YARD (SOLAR):	25'
MINIMUM SIDE YARD (MAIN STRUCTURE):	35'
MINIMUM SIDE YARD (ACCESSORY STRUCTURE):	25'
MINIMUM SIDE YARD (SOLAR):	25'
MINIMUM REAR YARD (MAIN STRUCTURE):	40'
MINIMUM REAR YARD (ACCESSORY STRUCTURE):	10'
MINIMUM REAR YARD (SOLAR):	25'
MAXIMUM HEIGHT OF MAIN STRUCTURE:	40'
MAXIMUM HEIGHT OF ACCESSORY STRUCTURE:	20'
MAXIMUM HEIGHT OF SOLAR PANEL:	12'
MAXIMUM BUILDING COVERAGE:	35%

REFER TO THE TOWN OF MIDDLETOWN'S GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION ZONING REQUIREMENTS FOUND IN CHAPTER 152 SECTION 725 OF THE TOWN'S ZONING CODE.

According to the posted Zoning Ordinance for the Town of Middletown, utility-scale solar facilities are permitted by right on properties within the Industrial zoning designation. The solar abuts residential zones so a 50' setback is also required and is incorporated on the plans.

Proposed Overall Project Scope:

GD Middletown West Main, LLC, proposes to construct a 2.50 MW AC solar energy project on a partially developed lot located at 1747 West Main Road in the Town of Middletown. The project is proposed to be constructed predominantly within an existing maintained field area.

Solar Project Data

The proposed solar installation consists of approximately 5,064 ground-mounted solar panel modules. Additionally, it will include transformers, inverters, switch-gear, an underground electrical cable connecting the solar panels to the electrical equipment, and newly installed interconnection with the National Grid circuit abutting the site to the east. The dimensions of each panel are approximately 2274mm tall by 1134mm wide. The panels will be mounted on pile driven supports at a height of between 9' and 12', dependent on the existing terrain. New utility poles are required by National Grid to be installed on the property for the purpose of interconnection between the solar array and the National Grid circuit that will then transition to underground conduit within the site. At this time six poles are anticipated to be added onto the property but could vary based on National Grid's final design.

The proposed panels encompass approximately 2.92 acres of the 12.67 acres. The total area within the proposed fence is 7.74 acres and the total limit of disturbance associated with the project is approximately 8.46 acres.

A fire safety access drive and 6' chain link security fence is also proposed on the property. A lockbox will be provided as necessary for emergency access. No buildings are required for the scope of this project. In addition, water service, sewer service, and on-site wastewater treatment systems are not required.

Landscaping

BETA Group Inc. prepared the proposed landscape plans and detail for the vegetated buffer. The existing vegetate buffer is proposed to remain. A variety of evergreen tree and shrub species are proposed to be supplemented to provide an effective buffer. The buffer plantings include 190 trees and shrubs.

Impact Statement:

Traffic and Parking

There will be construction traffic for the various construction activities including tree removal and processing, construction vehicles, construction materials brought onto the site (concrete, sand, etc.), and solar/electrical components when installation takes place, trash removal, etc. The final facility once construction is complete will generate very low traffic volume with only periodic site visits by technicians to check or troubleshoot equipment and/or grounds maintenance crews to maintain vegetation, etc.

Glare

"A common misconception about solar photovoltaic (PV) panels is that they inherently cause or create "too much" glare, posing a nuisance to neighbors and a safety risk for pilots. While solar PV systems can produce glare, light absorption - rather than reflection - is central to the function of solar PV panels. This fact sheet describes the basic issues surrounding glare from solar PV panels, the new Federal Aviation Administration guidance, and the implications for local governments."

Reference : *https://www.energy.gov/eere/solar/downloads/solar-pv-and-glare-factsheet*

"While in certain situations the glass surfaces of solar PV systems can produce glint (a momentary flash of bright light) and glare (a reflection of bright light for a longer duration), light absorption, rather than reflection, is central to the function of a solar PV panel - to absorb solar radiation and convert it to electricity. Solar PV panels are constructed of dark-colored (usually blue or black) materials and are covered with anti-reflective coatings. Modern PV panels reflect as little as two percent of incoming sunlight, about the same as water and less than soil or even wood shingles (SEIA/Sandia 2013). Some of the concern and misconception is likely due to the confusion between solar PV systems and concentrated solar power (CSP) systems. CSP systems typically use an array of mirrors to reflect sunlight to heat water or other fluids to create steam that turns an electric generator. These typically involve large ground-mounted reflectors, usually in remote desert locations, and are not installed in residential or commercial areas or near airports."

Reference: http://solaroutreach.org/wp-content/uploads/2014/06/Solar-PV-and-Glare-Final.pdf

Given the site location and extensive natural wooded buffers between the site and homes in the surrounding area glare impacts are not anticipated.

Thermal

Thermal impacts resulting from the construction and operation of the solar array are not proposed. A study in the UK concluded that large solar parks cause up to 5.2 degrees C cooling under the panels during the summer and up to 1.7 degrees C warming during the winter.

Reference: *IOP Publishing Environmental Research Letters "Solar park microclimate and vegetation management effects on grassland carbon cycling" by Alona Armstrong, Nicholas J Ostle, and Jeanette Whitaker published July 13, 2016.*

Likewise, the state of Massachusetts concluded that "there is no solar 'heat island' effect cause by the functioning of solar arrays".

Reference: *June 2015 Massachusetts Department of Energy Resources "Clean Energy Results Question & Answers Ground-Mounted Solar Photovoltaic Systems"*

Fiscal

The State of RI passed legislation that stipulates that cities and town can collect $5,000 per MW (AC) per year. The land will continue to be taxed by the assessor as well. The result is a positive impact to the Town because school, trash, plowing, etc. are not required and services for police and/or fire will be rare with a solar project such as this.

Municipal Utilities and Services

Water Supply

The proposed solar development does not require public water or private wells for the construction or operation of the facility.

Sewage Disposal

The proposed solar development does not require sewage waste disposal. Temporary facilities will be utilized and regularly maintained during the construction phase while work is ongoing.

Police, Fire Protection, Emergency Services

Schools

Unlike a residential development project, the proposed GD Middletown West Main I solar project will not result in an increase in population or school age children. The project will not require an office or manned building and will be monitored remotely with periodic visits by technicians to troubleshoot and/or perform routine equipment checks. Police and fire responses are expected to be low for this installation given it is a secure facility with locked gates and fencing. A lock box is commonly provided on these projects in the event emergency access is needed.

Environmental Conditions

Wetlands/ Floodplains

The wetlands and all wetland edges are approximate and based on delineations completed by Mason & Associates in 2018. The wetlands consist of forested wetland, wooded swamps with 50' perimeter wetlands, and streams with 100' or 200' riverbank wetlands as applicable. A RIDEM Insignificant Alteration permit was issued under Application No. 18-0326.

Vegetation/ Wildlife Habitat

A pollinator/ wildflower over is proposed within the solar array to provide additional habitat value versus turf grass perimeter vegetated buffers as well as wetland areas will continue to provide additional habitat value.

Community Characteristics

Lighting

The solar facility does not require artificial lighting as part of the project, so no lighting impacts are proposed.

Recreation

The site is currently private property and does not abut public recreational areas. No impact on recreational areas is proposed placement the site is currently zoned industrial and more intensive uses than the solar could be possible.

Stormwater/Soil Erosion

The redevelopment of the site will not have a significant impact on stormwater runoff conditions. The conversion of the field to solar will require interim soil erosion and sediment controls including perimeter controls (silt fence/straw wattles/etc.) and sediment traps until the solar project site is stabilized. Once the site is fully stabilized the temporary sediment traps will be removed and restored as pollinator/ wildflower meadow. The project is proposed as one phase with the disturbance areas segregated to one of two sediment traps such that the contributing area to each trap is less than 5 acres. The following reports provide detail on the measures proposed and overall design:

- Stormwater Management Report
- Soil Erosion and Sediment Control Plan

Operation and Maintenance

There are two elements to the operation and maintenance for the Site. We included an operation and maintenance narrative specific to the solar operation that outlines the aspects of asset management, monitoring, preventative maintenance, and general site /landscape maintenance. We also included an operation and maintenance program for the stormwater/soil erosion plan as a separate document. This is specific to meet RIDEM requirements and outlines responsible parties, maintenance tasks, public safety considerations (fencing, locked gate, lock box, warning signage), and checklists.

If you have any further questions on this matter, please feel free to contact me at your earliest convenience.

Sincerely,

Kevin C. Morin, PE
Director of Engineering & Development
Green Development, LLC