



January 3, 2024

Mr. Gregory Rondeau, Chairman
Franklin Planning Board
355 East Central Street
Franklin, MA 02038

**Re: Proposed Upper Union Solar Project
Site Plan Peer Review**

Dear Mr. Rondeau:

BETA Group, Inc. is pleased to provide updated engineering peer review services for the proposed project entitled **Upper Union Solar Project** in Franklin, Massachusetts. This letter is provided to outline findings, comments, and recommendations.

BASIS OF REVIEW

The following documents were received by BETA in response to our comments from November 29, 2023 and formed the basis of the review:

- Plans (10 sheets) entitled: **Site Development Plans for Upper Union Solar Project. Franklin Massachusetts** dated June 30, 2023, revised December 13, 2023, prepared by Atlantic Design Engineers stamped by Richard J. Tabacynski, PE No. 33746 and Edwin H. Gless, PLS No. 39045
- **Stormwater Addendum #2 for Upper Union Solar Project**, dated December 13, 2023.
- Letter from Atlantic Design Engineers to the Planning Board dated December 13, 2023, **RE: Response to BETA Site Plan Peer Review Comments, August 03, 2023, Upper Union Solar Project-Franklin, MA**, signed by Richard J. Tabacynski, PE No. 33746

Review by BETA will include the above items along with the following, as applicable:

- Site Visit
- **Zoning Chapter 185 From the Code of the Town of Franklin**, current through March 01, 2016
- **Zoning Map of the Town of Franklin, Massachusetts**, amended July 13, 2016
- **Stormwater Management Chapter 153 From the Code of the Town of Franklin**, Adopted May 02, 2007
- **Wetlands Protection Chapter 181 From the Code of the Town of Franklin**, current through August 20, 1997
- **Subdivision Regulations Chapter 300 From the Code of the Town of Franklin**, current through January 01, 2016
- MassDEP Wetlands Program Policy 17-1: Photovoltaic System Solar Array Review, dated September 23, 2017

INTRODUCTION

The project site is a 6.2±-acre parcel on the east side of Upper Union Street, just north of Ribero Drive at 0 Upper Union Street, (Parcel 009 on the Town of Franklin Assessor Map 319). The property is comprised of partially cleared areas and undeveloped woodland with a 325' wide New England Power Easement

running through the center of the site. Access to the site will come from frontage along Upper Union Street along a 20' wide paved driveway. The driveway will run east approximately 550' directly behind the existing abutting residential dwellings along Ribero Street.

The proposed development is a ground mounted Photovoltaic Power System. The limit of work for this system will be approximately 3.4 acres. Except for the Easement area, the entirety of the site is wooded currently. The site is located within the Industrial Zoning District. The southerly property line of the parcel forms the Zone line between the Industrial Zone and Rural Residential 1 Zone. The land to the north of the site is within the Industrial Zone. The project is not located within a FEMA mapped flood zone (area of 1% chance flood). NRCS soil maps indicate the soils at the site are of Charlton-Hollis -Rock outcrop complex, (fine sandy loam,) and Woodbridge fine sandy loam. The Charlton-Hollis-Outcrop complex is rated in Hydrologic Soil Group (HSG) A (high Infiltration potential), while the Woodbridge is rated C (low infiltration potential).

The project proposes to develop the site with approximately 2.5 acres of ground mounted solar modules, a separate equipment area at the entrance composed of inverters, cabinets, and transformers, 7' high security fencing, and a 20' wide gravel access driveway from Upper Union Street across the easement up to the solar modules. All the modules will be mounted on the east side of the Easement.

Except for the entrance driveway, there are no impervious surfaces proposed within the limits of the proposed development except those surfaces associated with the accessory equipment. Stormwater management will deal primarily with conformance with Standard 2 for peak flow rate attenuation. Stormwater management features proposed include the construction of a stormwater detention basin along the northerly edge of the access driveway at the western edge of the easement, a second detention basin at the far easterly edge of the parcel and an infiltration trench and deep sump catch basin at the entrance. The project as currently depicted will disturb more than one acre of land and is required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and file a Notice of Intent with EPA. As currently shown, the wetlands on site are located on the southern portion of the site inside the easement which are supported by a stormwater discharge culvert from the roadway surface at Ribero Drive. The access driveway and the lower southeast portion of the array project area will be located within the limits of the buffers to these existing wetland resource areas. A Notice of Intent has been filed with the Franklin Conservation Commission.

To assist with the review, all the comments addressed in the prior submission will be discontinued. The response to the comments from the November 30, 2023 review by Atlantic Design Engineers, Inc. will be labeled **ADE2: The** The BETA Response will be labeled **BETA2: The**

FINDINGS, COMMENTS, AND RECOMMENDATIONS

GENERAL

ZONING

The Site is located within the industrial (I) Zoning District. The proposed use is a Large-Scale Ground-Mounted Solar Energy System, which is permitted within this district following Planning Board Site Plan Review.

SCHEDULE OF LOT, AREA, FRONTAGE, YARD, AND HEIGHT REQUIREMENTS (§185 ATTACHMENT 9)

As shown on the schedule on the Zoning table on Sheet 5 of 9, the Site meets the requirements for lot area, depth, frontage, building height, and impervious area coverage. The lot width does not conform, however as noted in the bylaws, any lot created prior to May 20, 1998, is exempt from the current

definition. The design engineer has indicated that the lot was created in 1995 prior to the bylaw and is therefore grandfathered.

PARKING, LOADING AND DRIVEWAY REQUIREMENTS (§185-21)

The project proposes to construct a 20' wide access driveway from Upper Union Street to the gate at the entrance to the array area. A hammerhead turn around will be provided in front of the gate. The driveway will have a 50' long paved apron at the entrance and be gravel the remainder of the way to the gate which will measure approximately 900'. The driveway will be located directly behind the existing residential lots on Ribero Drive and proceed east for approximately 600' until it turns northeast across the easement to the array. The driveway will follow an existing 20' wide right of way easement that extends from Upper Union Street to an existing gravel roadway in the easement.

The project does not propose a residential or nonresidential building; therefore, no parking is required. BETA anticipates that there is adequate space along at turnaround areas for maintenance vehicles to temporarily park without disrupting access.

- P2. Around the perimeter of the array, the grade will range from 12-20%. BETA recommends that the applicant coordinate with the Fire Department to confirm that the perimeter access is acceptable.

ADE: The Deputy Fire Chief has indicated that he only requires access up to the break in panels in the middle of the array.

BETA: BETA will defer this to the Fire Chief. No Further comments.

INDUSTRIAL DISTRICT PERFORMANCE CONTROLS (§185-22)

The project is located within an Industrial District and therefore must conform to these requirements. Given the nature of the project, BETA does not anticipate vibration, odor, or flashing related impacts.

EARTH REMOVAL REGULATIONS (§185-23)

The project includes significant disturbance which may result in earth removal greater than 15 cubic yards.

- E1. Indicate approximate earth removal volume to determine compliance with this section.

ADE: The limited amount of excavation required for the project will allow the excavated material to remain and be re-used as fill on the site. No earth removal is anticipated.

BETA: BETA recommends that Construction Note 20 on Sheet 8 of 10 be expanded to note that no earth will be removed from the site.

ADE2: Construction note 29 has been revised according to BETA Groups comment. See revised Site Plans dated 12/13/2023.

BETA2: Comment addressed. No further comments

SIDEWALKS (§185-28) AND CURBING (§185-29)

No sidewalks are proposed under this project. As a solar facility, pedestrian access to the Site is not required. The project proposes to provide a 50' long paved apron in the proposed driveway entrance. A cape cod berm is proposed on the northerly edge of the driveway. BETA will defer to the Planning Board whether vertical granite or precast concrete curbing should be provided at the entrance.

ADE: A Cape Cod berm at the short, paved apron at the entrance is sufficient to convey any stormwater from the paved area into the proposed catch basin and infiltration chamber

Curbing is not required.

BETA: BETA will defer to the Planning Board on this matter.

SITE PLAN AND DESIGN REVIEW (§185-31)

The project has been submitted for Site Plan Review and is required to conform to the requirements of this section. The submitted plan set appears to be in compliance with all drawing requirements and review criteria, pending further review by the Fire Department to determine access requirements.

STORMWATER MANAGEMENT

The stormwater management design proposes two detention basins to capture stormwater runoff from the arrays and the gravel roadway. A catch basin is proposed at the entrance which will discharge to a subsurface infiltration trench beneath the driveway. Outfalls from this basin are proposed to convey captured stormwater runoff to the east. The remainder of the Site will generally follow pre-development flow patterns with no stormwater BMPs proposed.

- G1. The grading for the embankment that forms the detention basin at the northwest corner of the parcel is incorrect. The top width is shown incorrectly. Since the crest elevation is 405.5 with 3h:1v side slopes, the distance between the elevation 405 contours should be 9'. It is depicted on the plans as 4'.

ADE: *The basin berm has been regraded on the revised site plans and the basin detail has been revised to clarify the crest elevation.*

BETA: *The grading for the crest width has been corrected, however, the slope of the embankment at the down gradient edge of the basin has been increased to 2.5h:1v. Where this basin has been converted to an infiltration basin, BETA recommends that the slope be reduced to 3h:1v in accordance with Volume 2, Chapter 2 of the handbook.*

ADE2: *The basin berm has been regraded on the revised site plans and the basin detail has been revised to clarify the crest elevation.*

BETA2: *The basin detail and grading has been corrected. BETA recommends that a piece of granite or precast concrete be added to form the crest of the emergency spillway to prevent flow through the rip rap.*

- SW1. The discharge point from the northeast detention basin will change the nature of the flow onto the abutting parcel. Specifically, because of the proximity to the property line, the flow will not have the opportunity to replicate natural flow patterns. BETA recommends that the outfall be setback a sufficient distance for a natural flow pattern to develop or obtain an easement.

ADE: *The basin has been converted to an infiltration basin, based upon the favorable soil and groundwater conditions found in the test pits. The outlet pipe has been eliminated from the design. Therefore, any flow off the site will occur only under emergency overflow conditions. The toe of the basin has been shifted 20-feet away from the property line. A 50-foot long level spreader is provided at the base of the emergency spillway to replicate natural flow patterns in the unlikely event of an emergency overflow.*

BETA: *As noted, the basin will not discharge on to the abutting parcel except during a rainfall event greater than a 100-year frequency rainfall. Therefore, the issues with the discharge onto the abutting parcel are no longer an issue. However, because the basin serves both purposes of recharge and peak flow rate attenuation, a mounding analysis is required (Chapter 3, Volume 1)*

ADE2: *Atlantic has completed a mounding analysis. Please refer to Stormwater Addendum #2 dated 12/13/2023. Per an email from Gary James of BETA Group Inc. on 12/07/2023 (see attached), a groundwater mounding analysis is not required for the Cul-tec subsurface infiltration system.*

BETA2: *Mounding analysis provided. Results indicate no rise above floor of basin. No further comments.*

STORMWATER MANAGEMENT REGULATIONS (CHAPTER 153)

The project proposes to disturb land in excess of one acre within the Town of Franklin. It is therefore subject to the Stormwater Management Regulations. The project is also required to comply with the Town of Franklin Best Development Practices Guidebook (BDPG). Compliance with these regulations is outlined below and throughout the following sections.

SUBDIVISION REGULATIONS - STORMWATER MANAGEMENT REGULATIONS (§300-11)

Additional requirements for stormwater management are outlined in §300-11 of the Town of Franklin Subdivision Regulations.

MASSDEP STORMWATER STANDARDS

The project is subject to the Massachusetts Stormwater Standards as outlined by MassDEP. Compliance with these standards is outlined below:

NO UNTREATED STORMWATER (STANDARD NUMBER 1): *No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth. The project proposes two infiltration basins and a Cul-tec 100 HD Chamber system at the entrance.*

SW4. The paved driveway section which flows toward Upper Union Street must be treated in accordance with the standards. Provide calculations that document compliance with the standards.

ADE: *Refer to the Water Quality, Recharge and TSS removal calculations for the 1,137 SF asphalt area in the Miscellaneous Calculations section of the Drainage Addendum.*

BETA: *Since the infiltration rate qualifies as a higher rate, pretreatment must be 44% and should be documented.*

ADE2: *Atlantic has added a deep sump manhole along with the previously proposed deep sump catch basin, which achieves the pretreatment requirement. Please refer to revised Site Plans dated 12/13/2023 and Stormwater Addendum #2 dated 12/13/2023.*

BETA2: *In accordance with the stormwater standards, a deep sump manhole is not considered a treatment methodology. BETA recommends that the applicant consider implementing an Isolator row filter fabric wrap around the inlet row. Comment remains.*

- SW5. Construction details for the proposed infiltration trench at the entrance should also be included on the plans including design elevations and layout dimensions.

BETA: *There are no design elevations provided for the proposed Cul-tec system at the entrance. In addition, it appears that the system will be less than 4' above ESHGW and a mounding analysis will be required.*

ADE2: *Design elevations for the rims, pipe inverts, and stone inverts have been provided (Sheet 6 of the revised Site Plans). Per an email from Gary James of BETA Group Inc. on 12/07/2023 (see attached), a groundwater mounding analysis is not required for the Cul-tec subsurface infiltration system.*

BETA2: *Details for the trench have been provided. No further comments. (See SW4 above)*

- SW6. The runoff from the proposed equipment pad should be treated in accordance with the standards. Provide calculations which document that the treatment and pretreatment requirements for this impervious surface is being met.

ADE: *Refer to the Water Quality and Recharge calculations for the 640 SF of equipment pad in the Miscellaneous Calculations section of the Stormwater Addendum. The equipment pad is subject to foot traffic only so TSS removal is not required.*

BETA: *In accordance with Volume 1, Chapter 1 of the handbook, the equipment pad is subject to the Maximum Extent Possible. The infiltration basin at the northwest corner of the site will certainly provide the treatment and recharge required for this small area. Document TSS Removal based upon all the measures provided.*

ADE2: *Please refer to the Stormwater Addendum #2 for the completed TSS calculation for the equipment pad.*

BETA2: *TSS Calculation sheet provided. No further comments.*

POST-DEVELOPMENT PEAK DISCHARGE RATES (STANDARD NUMBER 2): *Stormwater management systems must be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. The project proposes changes to site hydrology and ground cover which will impact stormwater flow to the analyzed design points. Stormwater runoff will be mitigated via the 2 proposed detention basins. Calculations indicate a decrease in peak discharge rates.*

- SW8. In watershed 1S, the Tc for the proposed conditions is incorrectly reported greater than existing conditions. The slope on the final leg of the calculation for the existing conditions analysis is incorrect.

ADE: *The Tc calculations for watershed 1S have been revised in the Stormwater Addendum.*

BETA: *BETA recommends that the designer review the Tc calculations since the Tc for proposed is greater than existing. In addition, the hydrograph should be routed through the cul-tec trench.*

ADE2: *Pre-development Time of Concentration (Tc) for Subcatchment 1S was increased to 12.2 minutes to match Post-development conditions per an email from Gary James of BETA Group Inc. on 12/07/2023 (see attached). Please refer to Stormwater Addendum #2 dated 12/13/2023.*

BETA2: *Calculations corrected. No further comments.*

RECHARGE TO GROUNDWATER (STANDARD NUMBER 3): *Loss of annual recharge to groundwater should be minimized through the use of infiltration measures to maximum extent practicable.* NRCS soil maps indicate the soils at the site are of Charlton-Hollis -Rock outcrop complex, (fine sandy loam,) and Woodbridge fine sandy loam. The Charlton-Hollis-Outcrop complex is rated in Hydrologic Soil Group (HSG) A (high Infiltration potential), while the Woodbridge is rated HSG-C (low infiltration potential).

The project proposes new impervious surfaces on the site which must be treated in accordance with the requirements of the standards and the bylaw.

TOTAL SUSPENDED SOLIDS (STANDARD NUMBER 4): *For new development, stormwater management systems must be designed to remove 80% (90% per Town Bylaw) of the annual load of Total Suspended Solids (TSS).* The project is required to treat the 1.0-inch water quality volume per Town Bylaws.

SW16. For a new development Site, meet one of the following criteria (§153-16.B(1))

- a. Retain the volume of runoff equivalent to, or greater than, 1.0 inch multiplied by the total post-construction impervious surface area on the Site; and/or
- b. Remove 90% of the average annual post-construction load of TSS and 60% of the average annual load of total phosphorus.

ADE: *Calculations are provided in the Miscellaneous Calculations section of the Stormwater Addendum that show that greater than 1" times the impervious areas on the site is being retained/infiltrated on the site.*

BETA: *Calculated water quality volumes do not include runoff from the roof areas on the adjacent residential lots which are tributary to the infiltration measures which should be included unless they qualify for LID Credits. It should also be noted that because of the higher infiltration rate, the required pretreatment for all the impervious surface runoff should be 44% and documented accordingly.*

ADE2: *Atlantic has incorporated the roof runoff from the adjacent residential lots in the water quality calculation for Subcatchment 1S. Additionally, Atlantic has added a deep sump manhole along with the previously proposed deep sump catch basin, which achieves the pretreatment requirement. Please refer to revised Site Plans dated 12/13/2023 and Stormwater Addendum #2 dated 12/13/2023.*

BETA2: *Calculations provided. No further comments. (See SW4 above)*

HIGHER POTENTIAL POLLUTANT LOADS (STANDARD NUMBER 5): *Stormwater discharges from Land Uses with Higher Potential Pollutant Loads (LUHPPLs) require the use of specific stormwater management BMPs.* The project is not considered a LUHPPL – **not applicable.**

CRITICAL AREAS (STANDARD NUMBER 6): *Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas.* The project is not in a critical area as defined by the standards– **not applicable.**

REDEVELOPMENT (STANDARD NUMBER 7): *Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable.* The project is not considered a redevelopment– **not applicable.**

Mr. Gregory Rondeau, Chairman

January 3, 2024

Page 8 of 8

EROSION AND SEDIMENT CONTROLS (STANDARD NUMBER 8): *Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities. As the project proposes to disturb greater than one acre of land, it will be required to file a Notice of Intent with EPA and develop a Stormwater Pollution Prevention Plan (SWPPP). Erosion control measures are depicted on the plans include compost sock, silt fence, hay bales, inlet protection, stabilized construction entrance, dust control, erosion control blankets, filter bags for dewatering, and stockpile controls. A construction sequencing plan is included on Sheet C-608.*

SW23. The applicant is reminded that a Stormwater permit from the Franklin DPW is required based upon the size of the disturbance.

ADE: *The Stormwater Permit request was included in the original Planning Board submittal.*

OPERATIONS/MAINTENANCE PLAN (STANDARD NUMBER 9): *A Long-Term Operation and Maintenance Plan shall be developed and implemented to ensure that stormwater management systems function as designed. A Stormwater Operation and Maintenance Manual was provided with the Stormwater Management Report.*

ILLICIT DISCHARGES (STANDARD NUMBER 10): *All illicit discharges to the stormwater management system are prohibited. An Illicit Discharge Compliance Statement was provided with the submission.*

WETLANDS PROTECTION

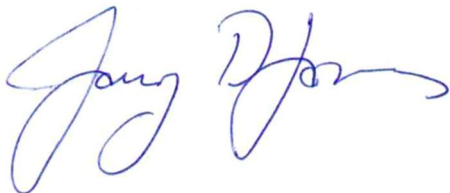
The Project proposes work within Areas Subject to Protection and Jurisdiction of the Franklin Conservation Commission, including the 100-foot Buffer Zones to a vegetated wetland. Work within these areas includes portions of the solar array, fencing, gravel access drives, grading, tree clearing, and equipment pad. Therefore, the Applicant is required to submit an NOI to the Town of Franklin Conservation Commission and must obtain an Order of Conditions to complete the proposed work.

ADE2: Acknowledged. A Notice of Intent was filed concurrently with the Conservation Commission. Public hearings are underway.

If we can be of any further assistance regarding this matter, please contact us at our office.

Very truly yours,

BETA Group, Inc.



Gary D. James, P.E.
Senior Project Engineer

cc: Amy Love, Town Planner



Town of Franklin

355 East Central Street
Franklin, Massachusetts 02038-1352



Phone: (508) 520-4907
www.franklinma.gov

DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT

DATE: January 4, 2024
TO: Franklin Planning Board
FROM: Department of Planning and Community Development
RE: Upper Union St Solar
Site Plan

The DPCD has reviewed the above referenced Site Plan Modification application for the Monday, January 8, 2024 Planning Board meeting and offers the following commentary:

General:

1. The site is on Upper Union Street, and located in the Industrial Zoning District.
2. The proposed project includes the construction solar panels, along with drainage.
3. The Applicant has filed a NOI with the Conservation Commission.
4. Review letters will be provided from BETA, DPW and Fire.

Suggested Special Conditions:

1. The Applicant will provide a decommissioning surety bond, in an amount agreed by the Planning Board and shall be issued by a surety company acceptable to the Town of Franklin prior to the pre-construction meeting.
2. Applicant shall enter into a tax agreement re: personnel property taxes with the Town of Franklin prior to start of construction.



December 13, 2023

Mr. Gregory Rondeau, Chairman
Franklin Planning Board
355 East Central Street
Franklin, MA 02038

***RE: Response to Planning Board's Site Plan Additional Comments, November 29, 2023
Upper Union Solar Project – Franklin, MA
ADE Job #3328.00***

Dear Mr. Rondeau:

This response letter addresses the comments made in the Planning Board's Site Plan Memo dated November 29, 2023, for above-referenced project. Please note the Planning Board's comments are italicized, and our responses follow in bold text:

- 1. Per section §185-31.C(3)(i) – provide outdoor lighting, open space areas, snow storage and parking areas.*

No lighting is proposed. A waiver is requested. Additionally, a note indicating there is no lighting proposed as part of this project has been added to Sheet 5.

- 2. Per section §185-31.C(3)(j) – provide location, size and sketch of all proposed signs.*

The only proposed sign is an emergency contact sign located on the solar array access gate. The revised site plans shows the location and detail of the proposed sign on Sheet 7 and Sheet 8, respectively.

- 3. Per section §185-31.C(3)(k) – provide a complete landscaping plans, including existing vegetation and proposed plantings.*

No landscaping is proposed. A waiver is requested. Mitigation and wetland replication planting plans by Goddard Associates have been provided separately to the Conservation Commission and are enclosed.

- 4. Per section §185-31.C(3)(l) – provide a photometric plan.*

No lighting is proposed. A waiver is requested. Additionally, a note indicating there is no lighting proposed as part of this project has been added to Sheet 5.



Mr. Gregory Rondeau, Chairman
Franklin Planning Board

Response to Town Engineer's Site Plan Additional Comments, November 29, 2023
Upper Union Solar Project – Franklin, MA (ADE Project #3328.00)
December 13, 2023, 2023 – Page 2

5. *Applicant is proposing cape cod berm along the roadway.*

A Cape Cod berm along the northern edge of the paved apron at the entrance is sufficient to convey any stormwater from the paved area into the proposed catch basin and infiltration chamber. In addition, the plans have been clarified this is a private driveway only, not a “roadway”. The topic was discussed at the 12/4/23 Planning Board meeting. The Board agreed a Cape Cod berm was sufficient and curbing was not required.

Comments from August 7, 2023:

1. *Provide screening around the transformer to block noise.*

Screening was discussed at the 12/4/23 Planning Board meeting. The Board agreed screening was not necessary based on the results of the Noise Attenuation Analysis completed by Atlantic Design Engineers on 11/10/23.

2. *Provide additional plantings throughout the site, along with a landscaping plan.*

The only proposed plantings are associated with the wetland mitigation and replication areas. Planting plans completed by Goddard Associates are enclosed.

3. *Provide a decommissioning bond and replanting schedule.*

A Decommissioning Plan and Estimate dated 12/11/23 is enclosed.

Please call us at (508) 888-9282 if you should have any questions.

Sincerely,

ATLANTIC DESIGN ENGINEERS, INC.

Richard J. Tabaczynski, P.E.
Vice President

CC: VS Union Solar Smart, LLC

EMAIL FROM GARY JAMES 12/7/2023

From: [Gary James](#)
To: [Brendon Reali](#)
Cc: alove@franklinma.gov; [Asa Smith](#); [Rich Tabaczynski](#)
Subject: Re: Upper Union Solar Project Franklin - Response to Comment Electronic Submittal
Date: Friday, December 8, 2023 8:26:20 AM
Attachments: [image002.png](#)
[image003.png](#)

see below

Gary D. James, PE

Senior Project Manager

BETA Group, Inc. | 781.255.1982

Build your future at BETA. [Apply now!](#)

From: Brendon Reali <breali@atlanticcompanies.com>
Sent: Thursday, December 7, 2023 5:22 PM
To: Gary James <GJames@BETA-Inc.com>
Cc: alove@franklinma.gov <alove@franklinma.gov>; [Asa Smith](mailto:asmith@atlanticcompanies.com) <asmith@atlanticcompanies.com>; [Rich Tabaczynski](mailto:rtaab@atlanticcompanies.com) <rtaab@atlanticcompanies.com>
Subject: RE: Upper Union Solar Project Franklin - Response to Comment Electronic Submittal

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. Hover over any links before clicking them and forward questionable emails to IT if you are unsure. Forward spam to spam@appriver.com

Hello Gary,

I am working on addressing comments provided within your November 29, 2023, letter for the Upper Union Solar Project located in Franklin, MA (see attached).

Regarding comment SW8:

Within the Post-Development Tc calculation for Subcatchment 1S, I have changed the 123 feet of shallow concentrated flow from woodland (Kv=5.0 fps) to short grass pasture (Kv=7.0 fps). This has reduced the Tc to 11.4 minutes, which matches Pre-Development.

In our opinion, routing the hydrograph through the cul-tec trench would complicate the analysis without changing the results. Post-development runoff rates and volumes for Subcatchment 1S meet or are below pre-development without the use of the cul-tec subsurface infiltration system. Accordingly, the cul-tec is only designed/required to hold water quality and recharge volumes. Any storm greater than 1-inch would bypass the system.

BETA: The 12.2 min Tc should be used for both conditions not the 11.4 since it is the longest time. Volumes will not change, and it looks like there will still be a reduction in peak flows regardless. In addition, after looking very closely at the grades in the front it appears that the actual watershed tributary to the CB will only be about 900 sq. ft. Based on that area the units

will store over 2" so ok.

Most of the runoff will bypass the entrance pad and flow to Upper Union on either side of the driveway. Just add a note along the edge of the driveway and show it to grade to drain along the outside edge rather than flow across the driveway.

Don't bother with the routing through the CB since most of the watershed will bypass anyway. Just get the pretreatment and you won't need a mounding analysis since it is only single purpose.

Thanks,

Brendon Reali
Project Engineer
Renewables & Environmental Science
 **Atlantic Design Engineers, Inc.**

1 (508) 888-9282 ext. 28

<https://link.edgepilot.com/s/8c9bd139/FBdX7tSh7k2MImpOtdZfZA?>

[u=http://www.atlanticcompanies.com/](http://www.atlanticcompanies.com/)

[Facebook](#) | [LinkedIn](#) | [Google Plus](#)

For sending larger files to Atlantic use:

[Atlantic's Upload Utility via Hightail](#)

From: Brendon Reali
Sent: Tuesday, November 28, 2023 11:01 AM
To: GJames@BETA-Inc.com
Cc: alove@franklinma.gov; Asa Smith <asmith@atlanticcompanies.com>; Rich Tabaczynski <rtab@atlanticcompanies.com>
Subject: RE: Upper Union Solar Project Franklin - Response to Comment Electronic Submittal

Hello Gary,

I am contacting you regarding the Upper Union Solar Project located in Franklin, MA.

I understand with the holiday you probably have not had enough time to complete an in depth review of our response to comments and revised site plans dated 11/10/23. However, since the Conservation Commission meeting is this Thursday (11/30) I wanted to check if there were any initial comments or questions.

If you could give me a call or provide a good number to reach you, I think it would be easiest to discuss over the phone.

Thanks,

Brendon Reali
Project Engineer
Renewables & Environmental Science

 [Atlantic Design Engineers, Inc.](#)

1 (508) 888-9282 ext. 28

<https://link.edgepilot.com/s/8c9bd139/FBdX7tSh7k2MImpOtdZfZA?>

[u=http://www.atlanticcompanies.com/](http://www.atlanticcompanies.com/)

[Facebook](#) | [LinkedIn](#) | [Google Plus](#)

For sending larger files to Atlantic use:

[Atlantic's Upload Utility via Hightail](#)

From: Gary James <>

Sent: Tuesday, November 21, 2023 1:25 PM

To: Asa Smith <asmith@atlanticcompanies.com>

Cc: Amy Love <>; colleen@valtaenergy.com; Rich Tabaczynski <rtaab@atlanticcompanies.com>

Subject: Re: Upper Union Solar Project Franklin - Response to Comment Electronic Submittal

ASA

Thank you for the files . I will review after the holiday.

Happy thanksgiving

Gary D. James, PE

Senior Project Manager

BETA Group, Inc. | 781.255.1982

Build your future at BETA. [Apply now!](#)

From: Asa Smith <asmith@atlanticcompanies.com>

Sent: Tuesday, November 21, 2023 10:31 AM

To: Gary James <GJames@BETA-Inc.com>

Cc: Amy Love <alove@franklinma.gov>; colleen@valtaenergy.com <colleen@valtaenergy.com>; Rich Tabaczynski <rtaab@atlanticcompanies.com>

Subject: Upper Union Solar Project Franklin - Response to Comment Electronic Submittal

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. Hover over any links before clicking them and forward questionable emails to IT if you are unsure. Forward spam to spam@appriver.com

Hello Gary,

In addition to the hard copy dropped off at your office on Friday (11/17), [Please use this link](#) to find the submittal package for the revised plans and response to comments for the Upper Union Street Solar project in Franklin.

Please let us know if you have any questions.

Thanks,

Asa Smith
Renewables & Environmental Science

 **Atlantic Design Engineers, Inc.**

1 (508) 888-9282 X 25

[https://link.edgepilot.com/s/7a00fb53/SHTwHSFRoEGFyuA0AhoejQ?
u=http://www.atlanticcompanies.com/](https://link.edgepilot.com/s/7a00fb53/SHTwHSFRoEGFyuA0AhoejQ?u=http://www.atlanticcompanies.com/)

Links contained in this email have been replaced. If you click on a link in the email above, the link will be analyzed for known threats. If a known threat is found, you will not be able to proceed to the destination. If suspicious content is detected, you will see a warning.

Confidentiality Notice:

This email message (and any attachments) contains information from BETA Group, Inc. that is confidential. If you are not the intended recipient(s), you may not disclose, copy, distribute, rely upon, or use its contents. Please reply to the sender immediately and delete this message. Thank you for your cooperation.

Confidentiality Notice:

This email message (and any attachments) contains information from BETA Group, Inc. that is confidential. If you are not the intended recipient(s), you may not disclose, copy, distribute, rely upon, or use its contents. Please reply to the sender immediately and delete this message. Thank you for your cooperation.

GODDARD CONSULTING PLANTING REPORTS

Buffer Zone Mitigation Plan
for
1056 Upper Union Street
Franklin MA, 02038
Map 319, Lot 9

ADDRESSED TO:

Franklin Conservation Commission
Franklin Municipal Building
355 E Central Street
Franklin, MA 02038

PREPARED FOR:

Atlantic Design Engineers, Inc.
39 Pleasant Street
Sagamore, MA 02561

PREPARED BY:

Goddard Consulting, LLC
291 Main Street, Suite 8
Northborough, MA 01532

Table of Contents:

- A. Existing Conditions**
- B. Proposed Conditions**
- C. General Installation Procedure**
- D. Planting Plan**
- E. Conclusion**

A. EXISTING CONDITIONS:

The subject parcel is a primarily forested site located at 1056 Upper Union Street Franklin MA (Map 319, Lot 9). The lot comprises approximately 6.21 acres and consists of natural wooded area with a maintained power line easement running through its center. A bordering vegetated wetland (BVW) system with an internal intermittent stream is present in the southeastern corner of the parcel. There are two locally jurisdictional isolated vegetated wetlands (IVW) located in the southwestern and central portions of the lot.

B. PROPOSED CONDITIONS:

The proposed project consists of the installation of a solar farm in the northeastern portion of the parcel, and associated access road and utilities. Due to site constraints regarding access, the access road is proposed in the small gap between the BVW and IVW onsite. Originally, this resulted in the disturbance of approximately 308 square feet of the 25' No Disturb Zone associated with these two wetland resources. As mitigation for this disturbance, 617 square feet of mitigation (2:1 ratio) was proposed by selecting an unvegetated cart path area to revegate and restore. This mitigation area will be located in the area of a footpath that is devoid of vegetation. This area was selected because it is the only area within the buffer zone that is not already vegetated with native species, as the lot is primarily forested and undeveloped. Plant quantities were determined based on MassDEP plant spacing guidelines.

As of November of 2023, the site's delineation has been modified to include all changes outlined during the peer review process. A greater area of the pinch point falls within the 25-Foot No Disturb Zone as the delineation was expanded. With the updated delineation, the site's required access now will impact 773 SF of the 25-Foot No Disturb Zone. As the lot is forested and undeveloped, the only area viable for restoration is the unvegetated cart path. This area remains proposed as restoration, however no additional areas can be selected to meet mitigation requirements as the lot is forested and undisturbed. The only remaining disturbed areas consist of the site's power line easement that is not able to be worked in. As such, a waiver request has been submitted as relief from the mitigation requirements that are unable to be met due to lot constraints.



Photo 1: View of footpath to be restored as mitigation.

C. GENERAL INSTALLATION PROCEDURES:

Supervision: All work within the mitigation area shall be supervised by a qualified wetland scientist with a minimum of five years' experience. Wetland scientist shall submit qualification for approval by the Conservation Commission prior to the commencement of work that requires supervision. The supervisor shall submit monitoring reports to the Conservation Commission as described below. Reports shall contain details of all work performed and photographs of completed conditions.

Timing: The installation of the plantings should be accomplished during the spring or fall growing seasons (between April 16 and May 31 or between September 16 and October 30).

Step 1: Identify Shrubs, Woody Debris, and Boulders to be re-used in Enhancement Area

The wetland scientist shall identify and flag any native wetland shrubs within the enhancement area that are to remain in place in the enhancement area. Trees that lie or stand along the edge of the enhancement area may be preserved at the discretion of the wetland scientist. Woody debris and boulders to be removed from the work area will be moved to the mitigation area to provide additional habitat features.

Step 2: Loosening of Compacted Soils

As the area to be planted is a historic cart path, soils within the planting area may be compacted. The wetland scientist shall inspect the soils in the field prior to the installation of the proposed plantings. If existing soils are not considered to be compacted and are considered suitable for planting, the area will be hand raked to loosen the soil, and 12" of clean loam will be spread over the area before planting. If soils are found to be too compacted for planting, soils will be excavated down beyond the compacted areas (approximately 1-2 feet is anticipated, more if needed) and the matching depth of clean loam will be spread over the area to provide a

viable planting surface that blends the area into the surrounding grade. Project wetland scientist will oversee the soil excavation to ensure proper planting substrates are created.

Step 3: Loaming and Planting

Loam will be spread over the enhancement area. Soils will be spread by hand raking only. Plantings will be installed according to the plan and immediately seeded with New England Wetland Plants Conservation Mix to stabilize the soils. Precise siting of plants may be determined by the wetland scientist in the field prior to installation. All plantings (reference the planting list from section C) shall be distributed randomly throughout the area; shrubs spaced at 8’ on center. All plantings will be removed from burlap sacks, wire cages and plastic containers prior to planting. Each plant will have its roots loosened prior to planting to encourage root growth away from the planting bulb. Leaf litter shall be spread throughout area if available. Conservation seed mix shall be scattered evenly by hand throughout the enhancement area.

Step 3: Monitoring

a. **Seasonal monitoring reports** shall be prepared for the enhancement area by a qualified wetland scientist for a period of 2 additional years after installation or every year until a COC is issued by the Franklin Conservation Commission. This monitoring program will consist of early summer and early fall inspections and will include photographs and details about the vitality of the enhancement area. Monitoring reports shall be submitted to the Commission by November 15th of each year. Monitoring reports shall describe, using narratives, plans, and color photographs, the physical characteristics of the enhancement area with respect to stability, survival of vegetation and plant mortality, aerial extent and distribution, species diversity and vertical stratification (i.e. herb, shrub and tree layers).

b. **At least 75% of the surface area** of the enhancement area shall be re-established with indigenous plant species within two growing seasons. If the enhancement area does not meet the 75% re-vegetation requirement by the end of the second growing season after installation, the Applicant shall submit a remediation plan to the Commission for approval that will achieve enhancement goals, under the supervision of a Wetland Specialist. This plan must include an analysis of why the areas have not successfully re-vegetated and how the Applicant intends to resolve the problem.

D. PLANTING LIST:

Proposed Plantings for Buffer Zone Mitigation Area (617 s.f.)

Common Name	Scientific Name	Indicator Status	Number	Size
Shrubs/Trees (n=11)*				
Red Maple	<i>Acer rubrum</i>	FAC	3	2-3’
Witch Hazel	<i>Hammamelis virginiana</i>	FACU	4	1-2 gal. pot
Black Chokeberry	<i>Aronia melanocarpa</i>	FAC	4	1-2 gal. pot
Seed Mix				
New England Wetland Plants Conservation/Wildlife Seed Mix or equivalent	Various	FACW, FAC, FACU, UPL	1	0.5 pounds

*Planting species and seed mixes may be substituted with Conservation Commission approval with similar native species with the same wetland indicator status if certain species are unavailable.

E. CONCLUSIONS

The proposed mitigation area will revegetate the only unvegetated area on-site outside of the existing easement. The mitigation plantings will provide wildlife value in the form of added habitat as well as providing a food source in an area previously not providing benefits to wildlife. All state and federal statutory interests and performance standards have been protected and will be met by the project, as described above. A waiver request is being submitted for relief from the additional mitigation requirements, as the natural state of the lot does not contain additional areas able to be used for mitigation.

Sincerely,

Goddard Consulting, LLC



Chris Frattaroli

Wetland Scientist

Andrew Thibault

Andrew Thibault, WPIT, WSA
Environmental Scientist

November 14, 2023

WETLAND REPLICATION PLAN
0 Upper Union Street Solar

0 Upper Union Street
Franklin, MA
Map 319, Lot 9

PURPOSE:
CONSTRUCTION DOCUMENT

PREPARED FOR:
VS Union Solar Smart, LLC
24941 Dana Point Harbor
Dana Point, CA 92629

All construction work discussed in this document shall be supervised by a qualified wetland scientist with a minimum of five years' experience.

Table of Contents:

- I. Existing Isolated Vegetated Wetland**
- II. Wetland Replication Area**
 - A. Location**
 - B. General Installation Procedure**
 - C. Planting Plan**
 - D. Conclusions**

I. EXISTING ISOLATED VEGETATED WETLAND

The subject parcel is a primarily forested site located at 1056 Upper Union Street Franklin MA (Map 319, Lot 9). The lot comprises approximately 6.21 acres and consists of natural wooded area with a maintained power line easement running through its center. A bordering vegetated wetland (BVW) system with an internal intermittent stream is present in the southeastern corner of the parcel. There are two locally jurisdictional isolated vegetated wetlands (IVW) located in the southwestern and central portions of the lot.

The northernmost Isolated Vegetated Wetland was discovered during the peer review process in the fall of 2023, and subsequently added to all site documents. The area measures approximately 1647 square feet and lies within the proposed solar field. The location of the IVW is such that the project is not viable to be redesigned due to the loss of required panels, and so the area is proposed to be filled and replicated at a 2:1 ratio. To ensure in-kind replication, the native tree and shrub species found within the IVW are to be proposed within the replication area.

II. WETLAND REPLICATION AREA

References: See Site Plans approved

A. LOCATION:

The proposed replication area measures 3294 SF and is located adjacent to wetland flags A14 to A21. The proposed roadway will allow machinery to reach the existing walking trails, allowing for streamlined access to the wetland replication area without disturbing areas outside of the approved limit of work. The project involves 1647 SF of fill of a bylaw jurisdictional IVW for the proposed solar panels. The proposed 3294 SF wetland replication area allows for a 2:1 ratio of wetland fill to replication meeting all local performance standards. Double sets of erosion controls will be installed along the limit of work to ensure adequate protection to the adjacent wetland resource area.

The location of the replication was selected for the following reasons:

- The area can easily be accessed by the proposed roadway. The roadway will bring machinery to meet the existing cart path, bringing machinery to the area with minimal impact. As a result, very few shrubs and brush will be removed or trampled to reach the Wetland Replication Area.

- The replication area directly abuts an existing BVW with similar vegetation and soil conditions as the impact area.
- The area within the forest was desirable for wetland replication due to the shade from surrounding large trees which will keep the wetland environment at a natural, cool temperature.
- The nearby topography of the uplands is a slight incline from the wetlands. Therefore, only 1-2 feet of grading will need to occur to reach desirable depths for necessary hydric soil conditions.
- The close proximity to BVW will allow the replication area to blend into a similar landscape provided nearby.
- This location allows the replicated wetland to fulfill more functions and values on a greater scale than the existing IVW, particularly in the sense of flood control due to its greater size and mild slope. The BVW replication area will provide protection of the following benefits: public or private water supply, ground water supply, flood control, storm damage prevention, prevention of pollution, and plant or wildlife habitat.
- Alternative areas were discussed throughout the property, but none provided the same benefits as the current proposed area. Access would not have been as easy, and the benefits of the surrounding landscape would not nearly be as beneficial as the extended BVW proposed. Further proximity to BVW and lack of shade from overstory canopy trees would have led to a less successful and desirable environment for a wetland replication area.

The following steps may be completed congruently to ensure transplanted vegetation is immediately planted.

B. GENERAL INSTALLATION PROCEDURES:

Supervision: All work within the replication area shall be supervised by a qualified wetland scientist with a minimum of five years' experience. Wetland scientist shall submit qualification for approval by the Conservation Commission prior to the commencement of work that requires supervision. The supervisor shall submit monitoring reports to the Conservation Commission as described below. Reports shall contain details of all work performed and photographs of completed conditions.

Timing: Work shall take place ideally when the wetland impact area is not saturated. If necessary, a dewatering plan shall be approved by the Conservation Commission. The construction and installation of the replication area should be accomplished during the spring or fall growing seasons (between April 16 and May 31 or between September 16 and October 30). Planting during these periods is highly recommended. The replication area grading is advised not to commence unless the contractor can guarantee completion of the work within the replication area within the same season.

Step 1: Stake Limits of Work, Confirm Wetland Flags in Place & Install ECB – At Replication Area

Staking out limits of work and confirmation of wetland flags are planned for the replication areas. Erosion control barriers shall then be installed in the form of staked siltation fence and mulch sock (or similar invasive-free barrier) placed at the limit of work for the replication area. Two sets are proposed for increased protection against erosion. These will remain in place and be maintained until the areas are completely stabilized and then may be removed after approval of the Conservation Commission. Wetland scientist shall have authority to require additional erosion control measures if deemed necessary.

Step 2a: Identify Shrubs, Woody Debris, and Boulders to be re-used in Replication Area

The wetland scientist shall identify and flag any native wetland shrubs within the replication area and the IVW impact area that may be dug up and stockpiled for use as additional plantings in the replication area. Any flagged specimens shall be removed and stockpiled in a designated area outside the replication area. Any large woody debris (rotting logs and tree stumps), moss covered boulders/rocks, ferns (royal fern, sensitive fern, cinnamon fern), and other ground cover shall also be identified and flagged for stockpiling and subsequent addition to the replication area. Wetland trees that lie or stand along the edge of the replication area may be preserved at the discretion of the wetland scientist.

Step 2b: Remove Trees and Vegetation

Once flagged trees, shrubs and woody debris specimens have all been removed and stockpiled, clear and remove all remaining vegetation within the replication areas in preparation for excavation and grading.

Step 3: Excavation of Wetland Soils at IVW Impact Area

Prior to any soil excavation, a storage area for soil and leaf litter shall be prepared; soil shall not be stored in buffer zone. Topsoil, leaf litter, and subsoil shall be stockpiled separately. Wetland soils from the IVW impact area will be excavated and transported to the replication area. The soils immediately surrounding the IVW impact area will also be transplanted to the replication area and will be placed along the inner border of the replication area to create a natural transition from upland to wetland soils.

Step 4: Excavation of Replication Area

An excavator or backhoe shall remove existing soils up to the edge of the proposed replication area boundary, to a depth at which redoximorphic features become visible in the C-horizon at the soil surface and at least one foot below proposed final grade, all of which shall be supervised and directed by the wetland scientist. Final grading will range from 439 feet to 440 feet as favorable hydrological conditions are reached. The general topography around the areas is a slight incline, so it is expected groundwater will be reached at the desired depths. Topsoil and subsoil shall be removed from the area for re-use elsewhere in the project site or removed from the site. Subsoil of the C-horizon shall be loosened prior to Step 5 to ensure soils aren't compacted prior to topsoil placement.

Step 5: Final Grading of Replication Area

Upon removal of existing soils down to the proper depth (as determined by the wetland scientist), the organic soil from the IVW impacts area will be placed within the replication area. If soils from the impact area are not sufficient, supplemental soils shall be imported, sourced from composted organic materials, and shall consist of a 50:50 mix of loam and organic material with an organic content between 12 and 20%. Topsoil shall be placed within the replication area to a depth 6-12" and even with the surrounding proposed elevation on design plan, to be determined by the supervising wetland scientist. Final grade shall be confirmed to be proper by the wetland scientist prior to plantings. Placement of soil shall be such that no equipment drives over or compacts placed soils. Final grading will result in micro relief of pits and mounds. Topography will create areas that pool and flood during heavy rain events and also see water near the surface during the wet season.

Step 6: Place Woody Debris and Boulders

Woody debris, stags, and moss-covered boulders currently lay on site in the proposed replication area. These shall be preserved and randomly placed throughout the replication area to provide cover for wildlife.

Step 7: Planting

Selected species, especially ferns, grasses and sedges, may be transplanted from the IVW impact area into the replication areas provided that the time of year and duration of plants' time out of soil is appropriate for survival of transplants. Precise citing of plants may be determined by the wetland scientist in the field prior to installation. All plantings (reference the planting list from section C) shall be distributed randomly throughout the area; trees spaced at 10-15' on center; shrubs spaced at 6-12' on center. Shrubs shall be planted in clumps of 3 the same species. As a rule, plants of the same species will be placed in groupings that more closely mimic natural conditions. Trees shall be planted on mounds and shrubs in depressions. Stockpiled shrubs will be placed first. All other plantings will be removed from burlap sacks, wire cages and plastic containers prior to planting. Each plant will have its roots loosened prior to planting to encourage root growth away from the planting bulb. Leaf litter shall be spread throughout area if available. Wetland seed mix shall be scattered evenly by hand throughout the replication area. Once all work is complete an erosion control barrier will be installed to enclose the replication area on the access side of the replication area.

Step 8: Erosion Controls Removal

Once the replication areas are stable, a request shall be submitted to the Conservation Commission to remove the erosion controls around the wetland replication areas. Upon approval of stabilization, erosion controls shall be removed promptly, and any significant disturbance shall be seeded with a wetland seed mix as specified in section C.

Step 9: Replication Monitoring

a. **Seasonal monitoring reports** shall be prepared for the replication areas by a qualified wetland scientist for a period of 2 additional years after installation or every year until a COC is issued by the Franklin Conservation Commission. This monitoring program will consist of early summer and early fall inspections and will include photographs and details about the vitality of the replication areas. Monitoring reports shall be submitted to the Commission by November 15th of each year. Monitoring reports shall describe, using narratives, plans, and color photographs, the physical characteristics of the replication areas with respect to stability, soil characteristics (i.e. horizons, depths, texture, percent gravel and rock, organic matter, Munsell hue, value and chroma, consistence and evidence of hydrologic influence), survival of vegetation and plant mortality, aerial extent and distribution, species diversity and vertical stratification (i.e. herb, shrub and tree layers). Invasive species will be documented if present, monitored and removed.

b. **At least 75% of the surface area** of the replication areas shall be re-established with indigenous plant species within two growing seasons. If the replication areas does not meet the 75% re-vegetation requirement by the end of the second growing season after installation, the Applicant shall submit a remediation plan to the Commission for approval that will achieve replication goals, under the supervision of a Wetland Specialist. This plan must include an analysis of why the areas have not successfully re-vegetated and how the Applicant intends to resolve the problem.

C. PLANTING LIST:
Proposed Plantings for Replication Area 1 (3294 s.f.)

Common Name	Scientific Name	Number	Size
Trees (n= 15)*			
Red Maple (FAC)	<i>Acer rubrum</i>	6	4-5'
American Elm (FAC)	<i>Ulmus americana</i>	3	4-5'
Tupelo	<i>Nyssa sylvatica</i>	3	4-5'
American Hornbeam	<i>Carpinus caroliniana</i>	3	4-5'
Shrubs (n=33)*			
Highbush Blueberry (FACW)	<i>Vaccinium corymbosum</i>	6	3 gal. pot
Winterberry (FACW)**	<i>Ilex verticillata</i>	6	3 gal. pot
Silky Dogwood (FACW)	<i>Cornus amomu</i>	12	3 gal. pot
Northern Arrowwood	<i>Viburnum recognitum</i>	9	3 gal. pot
Seed Mix			
New England Wetland Plants WETMIX or equivalent*	Replication area	1	2 lbs
New England Wetland Plants CONSERVATION SEEDMIX or equivalent*	Disturbed areas around replication area and access.	1	1 lbs

*Planting species and seedmixes may be substituted with Conservation Commission approval with similar native species with the same wetland indicator status if certain species are unavailable.

**Winterberry shall be planted at a ratio of at least 1 male to 5 females and shall not exceed a 1:1 male to female ratio.

D. CONCLUSIONS

The IVW impact area will be mitigated at a ratio of 2:1 with the final replication area. All local, state and federal statutory interests and performance standards have been protected and will be met by the project, as described above. The wetland replication plan has been designed to replicate the environmental attributes of the Isolated Wetland as closely as possible with the BVW replication, and to meet or exceed the benefits to local wildlife. The native trees and shrubs found growing within the IVW are proposed within the replication area for even greater species diversity. Stockpiled shrubs and soils will be transported and used within the replication area.

Sincerely,

Goddard Consulting, LLC

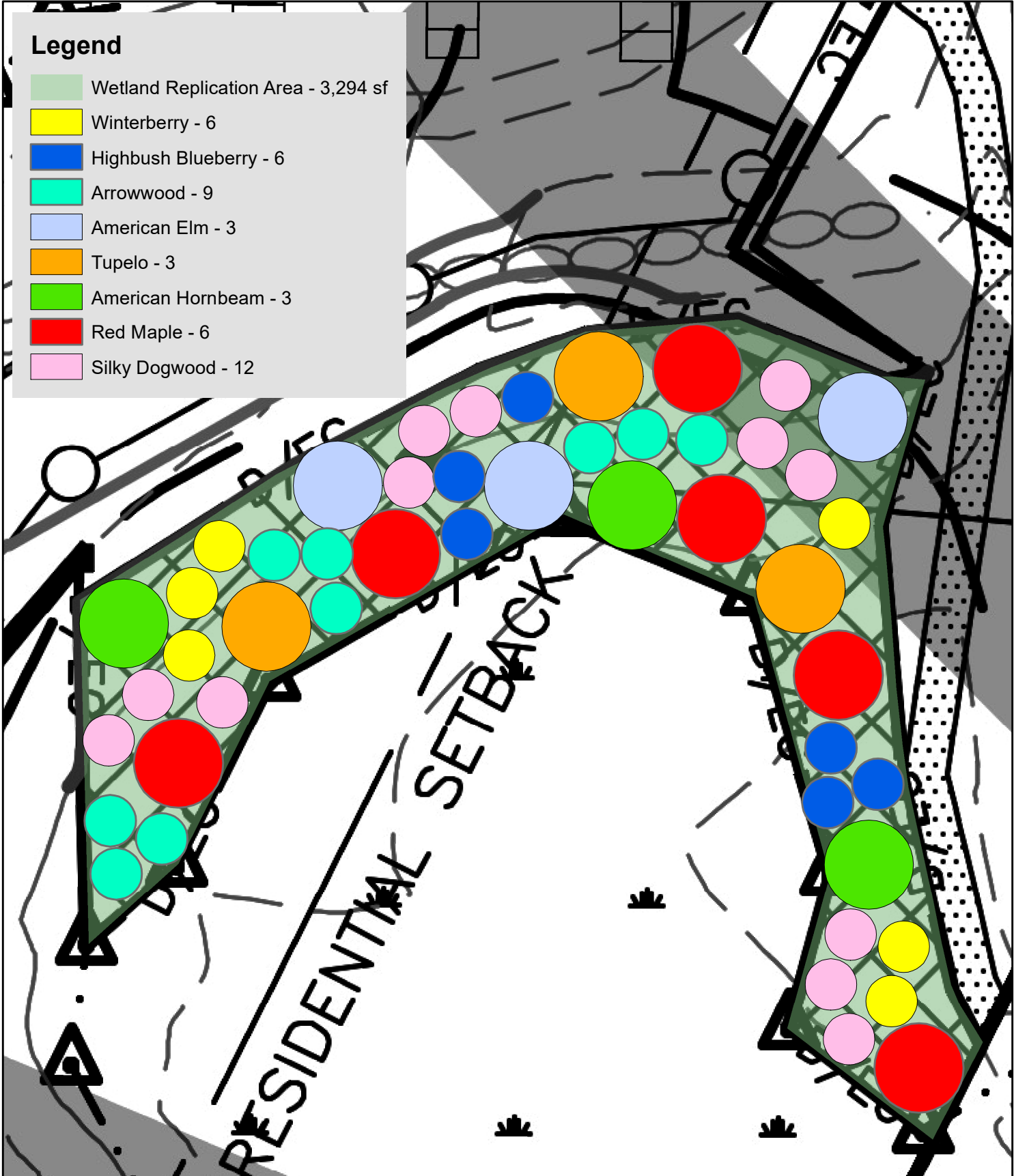
Andrew Thibault

Andrew Thibault, WPIT, WSA

Environmental Scientist

Legend

- Wetland Replication Area - 3,294 sf
- Winterberry - 6
- Highbush Blueberry - 6
- Arrowwood - 9
- American Elm - 3
- Tupelo - 3
- American Hornbeam - 3
- Red Maple - 6
- Silky Dogwood - 12



Date: 11/13/2023	GC Job Number: 101-083	Wetland Replication Area Planting Plan	0 5 10 Feet
GODDARD CONSULTING Strategic Ecological Consulting		1056 Upper Union Street Franklin, MA	1 in = 15 ft
		Map: 319, Lot: 9	

DECOMMISSIONING PLAN AND ESTIMATE



**Decommissioning Plan
for
Upper Union Street Solar Project
Franklin, Massachusetts 02038**

Applicant:
VS Union Solar Project, LLC
24941 Dana Point Harbor
Dana Point, CA, 92629

Prepared by:
Atlantic Design Engineers, Inc.
P.O. Box 1051
Sandwich, Massachusetts 02563

December 11, 2023

Atlantic Project No. 3328.00



I. FACILITY DESCRIPTION

This Decommissioning Plan has been prepared for the proposed solar photovoltaic facility to be constructed at Upper Union Street in Franklin, Massachusetts. This plan describes the process for decommissioning the facility in accordance with state requirements and the Town of Franklin's Site Plan review process. The facility will consist of a fenced in area of ± 2.2 -acres containing a solar array with 839 modules and accompanying equipment secured within a 7' high chain-link fence and accessed via a 20' wide locked swing gate off an access road from Upper Union Street.

The Facility will include the following site features which will require decommissioning at the end of the life of the project:

- An approximately 2.2-acre array of 839 photovoltaic (PV) modules and racking system within the chain-link fence;
- Piles supporting the PV modules and racking system;
- One (1) MIT-CAT-100 Transformer, two (2) SE120KUS Inverters, and all other electrical equipment cabinets;
- 7-foot chain-link security fence;
- Underground conduit and wires;
- A 20' wide locking chain link security access gate at the entrance to the array area;
- Two (2) 10' wide chain link access gate for access to stormwater facilities;

II. DECOMMISSIONING PLAN

The decommissioning of the facility will be a two-stage process consisting of Dismantling, Demolition and Disposal/Recycling followed by Site Restoration. The following is a description of each process.

Dismantlement, Demolition, and Disposal or Recycling

A significant portion of the components that comprise the facility will include recyclable or re-sealable components including copper, aluminum, galvanized steel, and the modules. Due to their re-sale monetary value, these components will be dismantled, disassembled, and recycled rather than being demolished and disposed of. A Salvage Estimate of materials or equipment of value has been included within the attached calculations. Salvage items, as listed in **Table A**, will be sold back to the manufacturer or to a recycling facility.

All electrical connections to the system will be disconnected and all connections will be tested locally to confirm that no electric current is running through them before proceeding. The facility will be dismantled following coordination with the utility company regarding timing and required procedures for disconnecting the facility from the utility distribution network. All electrical connections to the PV modules will be severed at each module, and the modules will then be removed from their framework by cutting or dismantling the connections to the supports. Modules will be removed and sold to a purchaser



or recycler. In the event of a total fracture of any modules, the interior materials are silicon-based and are not hazardous. Disposal of these materials at a landfill is permissible.

The PV mounting system framework will be dismantled and recycled. The foundation system will be removed and recycled if feasible. All other associated structures will be demolished and removed from the site for recycling or disposal. This will include the site fencing and gates, which will likely be reclaimed or recycled.

Concrete equipment slabs will be broken and removed to a depth of one foot below grade and clean concrete will be crushed and disposed of off-site or recycled (reused either on or off-site). The paved access road will remain in place. The gravel access road within the perimeter fence surrounding the PV modules will remain in place.

Aboveground utility poles owned by the project operator will be completely removed and disposed of off-site in accordance with utility best practices. Any overhead wires will be removed from the facility and will terminate at the utility-owned connections on Upper Union Street. The utility company will be responsible for dismantling the overhead wires and poles under its ownership. The decommissioning contractor will coordinate with the utility company personnel to facilitate the utility company's removal of any poles and overhead wires located on the site. Stormwater basins, swales and rip-rap areas will remain in place.

A final site walkthrough will be conducted to remove debris and/or trash generated during the decommissioning process. Any debris that may have been wind-blown to areas outside the immediate footprint of the facility being removed. Sanitary facilities will be provided on site for the workers performing the decommissioning of the facility.

Site Restoration

The ±3.68-acres disturbed during decommissioning will be re-graded to recreate a uniform slope similar in grade to conditions that existed prior to facility construction. All disturbed areas will be revegetated with seed or hydro-seed, using a fast-growing seed mix. The gravel access road within the perimeter fence, gravel access road outside the perimeter of the fence, paved apron, and stormwater basins/facilities/rip rap areas will remain in place.

Permitting Requirements

Several approvals will be obtained prior to initiation of the decommissioning process. Permitting requirements will be determined at the time of decommissioning and updated based on current local, state, and federal regulations. The decommissioning process is anticipated to take approximately six to eight weeks and is intended to occur outside of the winter season. In accordance with the requirements of the Town of Franklin Zoning Bylaws, the owner/operator shall notify the Site Plan Review Authority (Planning Board) by certified mail of the proposed date of discontinued operations and the



decommissioning will be completed no more than 150-days after the date of discontinued operation. Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, the solar photovoltaic installation shall be considered abandoned when it fails to operate for more than one year without the written consent of the Planning Board. Based upon current regulations, a building/demolition permit will be required from the Town of Franklin Building Department for the decommissioning of this site because a building/demolition permit must be obtained for any demolition or change to the use of a structure.

III. DECOMMISSIONING COST ESTIMATE

Atlantic has reviewed multiple solar decommissioning cost estimates in the preparation of this decommissioning plan. The estimated net present value of decommissioning cost for the proposed Upper Union Solar Project, including salvage is \$10,058.00. **Table 1**, attached below shows an itemized estimate of decommissioning costs that have been taken into account within our estimate.

Assuming a 2.5% yearly inflation for the 20-year project life span and assuming salvage value, the proposed financial surety amount is **\$16,481.00.**

TABLE 1
Upper Union Solar Project (12-11-2023)

System Information Summary	
Total System Module Count	839
Total System Inverter Count	2
Racking Orientation	2 Up Vertical
Linear Feet of Racking	2932.91
Estimated Aluminum per Foot of Racking (lbs)	2
Estimated Steel Per Foot of Racking (lbs)	4.5
Estimated Length of Interconnection to Street (feet)	973
Anticipated Project Lifespan for Inflation Calculation (years)	20
Ballasted System (Y/N)	No

Decommissioning Summary	
Estimated Business Days to Demolish (8 Man Crew - Rate of 350 modules, 2 Inverters & 500 Linear Feet of Racking/Day)	4
Estimated Total Number of 40 Yard Dumpsters (400 Modules/2INV/Miscellaneous Debris Per Container)	3
Dumpster Disposal Cost (\$1,000 per Dumpster for 21-day Period)	\$ 3,000.00
Labor Cost - 8 Man Crew (\$60/Hour)	\$ 15,360.00
Equipment Cost (\$125/Hour)	\$ 4,000.00
Grading and Reseed (2.5% Labor & Equip Costs) & (10 lb/acre @ \$50/lb)	\$ 2,324.00
Total Current Day Decommissioning Estimate	\$ 24,684.00
Decommissioning Costs Using Lifespan with 2.5% Inflation	\$ 40,448.00

Salvage Value Summary	
Estimated Copper Salvage (lbs)	3,892.00
Estimated Aluminum Salvage (lbs)	5,865.82
Estimated Steel Salvage (lbs)	13,198.10
Current Day Salvage Pricing for Copper (\$/lb)	\$ 2.85
Current Salvage Pricing for Aluminum (\$/lb)	\$ 0.40
Current Salvage Pricing for Steel (\$/lb)	\$ 0.09
Estimated Copper Salvage Value	\$ 11,092.20
Estimated Aluminum Salvage Value	\$ 2,346.33
Estimated Steel Salvage Value	\$ 1,187.83
Estimated Ballast Salvage (@ \$12/Ton With Metal - 2019)	\$ -
Estimated Total Salvage Value	\$ 14,626.36
Estimated Total Salvage Value Using Lifespan with 2.5% Inflation	\$ 23,966.99

(Mid City Scrap - 12/23)
(Mid City Scrap - 12/23)
(Mid City Scrap - 12/23)

Estimated Future Decommissioning Cost Including Estimated Future Salvage Value	\$ 16,481.01
---	--------------