Exhibit MHG-MLS-1

# Natural Resources Assessment for:
# 500 kW Photovoltaic Electric Generation Facility
# Richville Road Solar

## Manchester, Vermont

*Prepared by:*
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**500 kW Photovoltaic Electric Generation Facility**
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# Richville Road Solar Project

## I. Summary Findings

Arrowwood Environmental, LLC (AE) conducted a natural resources assessment for the proposed Richville Road Solar ("Project") located off Richville Road in Manchester, Vermont. The site assessments were conducted during the fall of 2019. The Project site is characterized as a mowed field and forested hedgerow. AE assessed natural resources criteria incorporated by the Public Utility Commission into the review of solar projects, including streams and headwaters, outstanding resource waters, shorelines, wetlands, rare and irreplaceable natural areas, necessary wildlife habitat, and rare, threatened and endangered species.

There are no shorelines, streams, outstanding resource waters, rare and irreplaceable natural areas, or necessary wildlife habitat, or rare, threatened or endangered ("RTE") species at the Project site. Thus, there will be no adverse impact on these resources.

AE identified and mapped two wetlands in the Project vicinity. Ms. Rebecca Chalmers from the Vermont Wetlands Program has determined one of these wetlands to be Class 2 and the other Class 3. The Project has been sited to avoid the Class 2 wetland and its 50' buffer. The Class 3 wetland consists of a low area in the field and lacks the functions and values necessary to warrant regulation by the Vermont Department of Environmental Conservation.

The Project site is within the Groundwater Source Protection Area associated with the public water system ID VT0005022 located across approximately ¾ mile southwest of the Project. All work during Project construction will be performed in accordance with the Vermont Standards & Specifications for Erosion and Prevention and Sediment Control, (February 2020). The Project will not involve the disposal of wastes and will not involve the injection of waste materials or any harmful toxic substances into groundwater or wells. The proposed Project will not result in a reduction of the quality of ground or surface waters in the area.

The Project site is also part of known wood turtle habitat along the Bourn Brook and the Batten Kill River. The wood turtle is not a RTE species but is ranked as S3-uncommon in the state. Impacts to wood turtles will be avoided by allowing turtles access to the site post-construction and imposing vegetation management restrictions.

In summary, AE concludes that the Project has been sited and designed to avoid undue adverse impacts to natural resources including shorelines, streams and headwaters, outstanding resource waters, wetlands, rare and irreplaceable natural areas, necessary wildlife habitat, and rare, threatened, and endangered species.

## II. Introduction and Project Description

Arrowwood Environmental, LLC (AE) was retained by MHG Solar, LLC to perform a natural resources assessment for a proposed 500 kW (AC) photovoltaic electric generation facility located on ~ 5.6 acres of a privately-owned property in Manchester, Vermont. The Project site is characterized as mowed field with a wooded hedgerow.

The site will be accessed via Richville Road. The Project will connect to the existing electric distribution line located along Richville Road at existing pole UP-21-28.

**Project site (10/29/19)**

This report outlines AE's findings related to natural resources criteria incorporated by the Public Utility Commission into the review of solar projects, including: streams and headwaters, outstanding resource waters, shorelines, wetlands, rare and irreplaceable natural areas, necessary wildlife habitat, and rare, threatened and endangered species.

The natural resources assessment involved both a remote review of available digital databases as well as field investigation at the Project site in September and October 2019.

## III. Site Characterization

The Project is located in Manchester, Vermont, off Richville Road. Ecologically the site is within the Vermont Valley biophysical region of the state (Thompson, Sorenson, and Zaino 2019). The Project is located at approximately 700 feet above mean sea level according to U.S. Geologic Survey ("USGS") topographic data and is generally flat. The mapped bedrock that is underlying the site is dolostone from the Dunham Dolostone Formation. (Ratcliffe et al. 2011). The soils are mapped as Copake gravelly fine sandy loams and Limerick silt loams. (NRCS Soil Survey). The surrounding landscape is dominated by residential development and patches of forestland.

## IV. Criterion 1(A) Headwaters

The headwaters assessment involved both a remote review of the USGS topographic map and Vermont Hydrography Dataset (streams, rivers, and waterbodies) and field investigation in the fall of 2019. The Project site is located within the Groundwater Source Protection Area associated with the public water system ID VT0005022 located approximately ¾ mile southwest of the Project. All work during Project construction will be performed in accordance with the Vermont Standards & Specifications for Erosion and Prevention and Sediment Control, February 2020. The Project site, including space between the solar panels, will remain vegetated and maintained with mowing or brush hogging conducted without the use of chemical herbicides. The Project will not involve the disposal of wastes and will not involve the injection of waste materials or any harmful toxic substances into groundwater or wells. Additionally, the Project will use non-toxic coolant in pole-mounted transformers. Accordingly, the proposed Project will not result in a reduction of the quality of ground or surface waters in the area. For these reasons, we conclude that the Project will have no adverse impact on headwater areas.


**Figure 1. Project Site and Nearby Natural Resources.**

## V. Criteria 1(E) Streams and Section 248(b)(8) Outstanding Resource Waters

The stream assessment involved both a remote review of the USGS topographic map and Vermont Hydrography Dataset (streams, rivers, and waterbodies) and field investigation in the fall of 2019. There are no surface waters within the Project footprint. The closest surface water is Bourn Brook, a tributary to the Batten Kill River, approximately 140' north of the Project area. The Project will

not result in any clearing of forest vegetation within 50' of the top of the bank of the stream. Accordingly, the Project will maintain the natural stream condition for the streams identified, and will not endanger the health, safety, or welfare of the public or adjoining landowners. For these reasons, AE concludes that the Project will have no adverse impact on streams.

The Agency of Natural Resources has listed four waterways as Outstanding Resource Waters (ORW): Batten Kill River in towns of East Dorset and Arlington; Pike's Falls/Ball Mountain in the town of Jamaica; Poultney River in the towns of Poultney and Fair Haven; and Great Falls, Ompompanoosuc in the town of Thetford. The Batten Kill River is located 650' west of the Project and will not be impacted by the Project. There are no waters which intersect the Project that have been designated as an ORW. Therefore, the Project will not result in any impact to ORWs.

## VI. Criterion 1(F) Shorelines

AE reviewed USGS topographic maps, the Vermont Hydrography Dataset (streams, rivers, and waterbodies), and digital orthophotography. The site of the proposed Project is not located on a shoreline of a river, lake, pond or reservoir. The closest shoreline to the Project is that of the Bourn Brook ~140 ' north of the Project area. The Project will not result in any clearing of forest vegetation along the shores of the Bourn Brook. The proposed Project will result in no adverse impact to shorelines.

## VIII. Criterion 1(G) Wetlands

The wetland assessment involved both a remote review of available maps (including Vermont Significant Wetland Inventory Maps and the NRCS Soil Survey) and a field inventory component conducted in the fall of 2019. The protocols put forth in the USACE's *Corp of Engineers Wetlands Delineation Manual* (2009 Regional Supplement for the Northcentral and Northeast Region) were employed for delineating wetlands as is the standard practice in Vermont.

AE identified and mapped two wetlands in the Project area. Ms. Rebecca Chalmers from the Vermont Wetlands Program has determined that one of the wetlands is Class 2 and one of the wetlands is Class 3. We agree with the Vermont Wetlands Program that the Class 3 wetland on the Project site lacks any functions and values; impacts to this wetland are limited to post

placement to support the solar modules. The Project has been sited to avoid all impacts to the Class 2 wetland and its associated 50' buffer. All project disturbance, including an area required for vegetation management outside of the perimeter fence, is located outside of this 50' wetland buffer. Buffer zone boundaries will be demarcated prior to site preparation and construction where the Project is within 100' of any Class 2 wetland to avoid accidental encroachment. Demarcation will consist of a continuous line of visible flagging outside of the buffer zone boundaries to identify wetland buffer zones as protected areas. For these reasons, the Project does not require a Vermont Wetlands Permit, and AE concludes that the proposed Project will have no undue adverse impact on Class 2 wetland resources.

## IX. Criterion 8 Rare and Irreplaceable Natural Areas

The Rare and Irreplaceable Natural Areas assessment involved both a remote review of available digital maps for the Project area and a field review in the fall of 2019. AE reviewed digital orthophotography, the NRCS Soil Survey, the 2011 Bedrock Geologic Map of Vermont and the Wildlife Natural Heritage Inventory (NHI) Rare, Threatened and Endangered Species digital database.

This site is a mowed field and a small forested hedgerow. This area does not constitute a significant natural community or a Rare and Irreplaceable Natural Areas (RINA). No RINAs are present within the Project area. Since there are not Rare and Irreplaceable Natural Areas in the Project area, there will be no adverse impacts on any Rare and Irreplaceable Natural Areas.

## X. Criterion 8(A) Necessary Wildlife Habitat and Rare, Threatened and Endangered Species

The wildlife habitat assessment involved both a remote review of available digital maps for the Project area and a field inventory component. A remote review of available digital databases was conducted to identify and map necessary wildlife habitat (including State of Vermont Deeryard data layer, Vermont Dept. of Fish, USGS Topographic map, "VT HYDRODEM" elevation data) within the Project area and within the vicinity of the Project area.

Site visits were conducted in the fall of 2019 to assess wildlife, wildlife habitats, and rare, threatened, and endangered species.

## A. Necessary Wildlife Habitats

### 1. White-tailed Deer Wintering Habitats

There are no mapped VT Fish and Wildlife Department white-tailed deer (*Odocoileus virginianus*) winter habitats in the Project area. The nearest State mapped deer winter areas are approximately 1 mile southeast of the Project site. AE confirmed the absence of historic or recent deer wintering activity as well as lack of forested areas containing significant enough soft wood canopy closure to be considered DWA habitat in the Project area. The proposed Project will have no adverse impact on DWA resources.

### 2. Black Bear Habitat

The mowed field and hedgerow comprising the Project site does not provide necessary habitat for the black bear (*Ursus americanus*) and no sign of black bear was found at the proposed site.

### 3. Grassland Bird Habitat

The ~5.6 acre mowed field and hedgerow comprising the Project site does not provide grassland bird habitat.

## B. Rare, Threatened and Endangered (RTE) Species

The RTE species review involved both a remote review of available digital maps for the Project area as well as a field survey. AE reviewed digital orthophotography, the NRCS Soil Survey, the 2011 Bedrock Geologic Map of Vermont and the Wildlife Natural Heritage Inventory (NHI) Rare, Threatened and Endangered Species digital database.

### 1. RTE Animal Species

The Northern Long Eared Bat (LEB) became a federally listed endangered species in May of 2015. The State of Vermont has determined that project clearing constituting greater than 1% of the total forested area within a 1 square mile radius of a project triggers review for habitat loss of this endangered species. The proposed Project will result in 0.08 acres of clearing, which is less than 0.5% of the total forested area within a 1 square mile radius.

An inventory of potential roosting trees for Indiana bat was performed on the site. A partially dead basswood tree with cavities was documented on the northern property line. This potential roosting tree will not be impacted by the Project. There are no old or abandoned buildings potentially providing roosting habitat for little brown bat proposed for demolition. There will therefore be no adverse impacts to bats or bat habitat from the Project.

The Project site overlaps with an area mapped by the Vermont Natural Heritage Inventory as wood turtle habitat. Wood turtles are an S3-ranked uncommon species in the state that forage in upland areas along rivers. In order to allow wood turtles access to this area, fencing will not be used or "permeable" fencing will be installed. The permeable fence will include 12" wide x 7" tall openings at the bottom to allow wood turtle entry and exit. In addition, to prevent wood turtle mortality during vegetation management, all site mowing will be limited to the period between October 15 and March 15 when this species will not likely be present on the site. There will therefore be no adverse impacts to wood turtles or wood turtle habitat from the Project.

### 2. RTE Plant Species

The site survey for RTE plant species was conducted at the Project site by Michael Lew-Smith on September 26, 2019. A complete list of plant species recorded during this inventory is included in Appendix 1. No rare, threatened or endangered plant species were documented during this inventory. A small population of 20 individuals of Frank's lovegrass (*Eragrostis frankii*), an S3-ranked uncommon species, was documented within the Project area as shown in Figure 1. This species prefers somewhat disturbed soils and will likely persist on the site post-construction.

Since there are no RTE plant species present in the project area, no impacts to RTE plants are expected.

## XI. References

Argentine, Cindy Corlett. Vermont Act 250 Handbook. Putney Press. 2008.

Natural Resources Board. Vermont Wetland Rules. Effective January 21, 2020.

Natural Resources Conservation Service. Soil Survey Maps.

Ratcliffe, N.M., Stanley, R.S., Gale, M.H., Thompson, P.J., and Walsh, G.J., 2011, Bedrock geologic map of the Vermont: U. S. Geological Survey Scientific Investigations Map 3184, scale 1:100,000.

Thompson, Elizabeth H. and Eric R. Sorenson, and Robert J. Zaino. Wetland, Woodland, and Wildland: A Guide to the Natural Communities of Vermont. The Nature Conservancy of Vermont, 2019.

Vermont Center for Geographic Information (VCGI). EcologicHabitat_DEERWN GIS data layer. Provided by Vt. Dept. of Fish and Wildlife, release date April 1, 2011.

Vermont Fish and Wildlife Department Regulatory Review Guidance for Protecting Northern Long-eared Bats and Their Habitats. February 2017.

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# Appendix 1

# Plant Species List

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# Rare, Threatened and Endangered Plant Inventory

Report Date: 5/5/2020

Project Name Richville Road Solar

Botanist Michael Lew-Smith

Survey Date 9/26/2019

Description Proposed solar facility in a mowed field and hedgerow

Plant List

*note: plants with no listed S-Ranks are considered common in Vermont.

| Plant Name | Common Name | S-Rank* | T/E | Plant Family |
|---|---|---|---|---|
| *Toxicodendron radicans* | climbing poison-ivy | | | Anacardiaceae |
| *Anthriscus sylvestris* | wild chervil | | | Apiaceae |
| *Daucus carota* | Queen Anne's lace | | | Apiaceae |
| *Pastinaca sativa* | parsnip | | | Apiaceae |
| *Ambrosia artemisiifolia* | common ragweed | | | Asteraceae |
| *Arctium lappa* | great burdock | | | Asteraceae |
| *Bidens vulgata* | tall beggar's-ticks | | | Asteraceae |
| *Cichorium intybus* | chicory | | | Asteraceae |
| *Doellingeria umbellata* | tall white aster | | | Asteraceae |
| *Erechtites hieraciifolius* | pilewort | | | Asteraceae |
| *Erigeron annuus* | white daisy-fleabane | | | Asteraceae |
| *Erigeron canadensis* | horseweed | | | Asteraceae |
| *Eurybia divaricata* | white wood aster | | | Asteraceae |
| *Euthamia graminifolia* | grass-leaved goldenrod | | | Asteraceae |
| *Rudbeckia hirta* | black-eyed Susan | | | Asteraceae |
| *Scorzoneroides autumnalis* | fall dandelion | | | Asteraceae |
| *Solidago canadensis* | Canada goldenrod | | | Asteraceae |
| *Solidago gigantea* | large goldenrod | | | Asteraceae |
| *Solidago rugosa* | rough-leaved goldenrod | | | Asteraceae |
| *Symphyotrichum lateriflorum* | calico aster | | | Asteraceae |
| *Symphyotrichum novae-angliae* | New England aster | | | Asteraceae |
| *Symphyotrichum puniceum* | red-stemmed aster | | | Asteraceae |
| *Taraxacum officinale* | common dandelion | | | Asteraceae |
| *Tussilago farfara* | colt's-foot | | | Asteraceae |
| *Athyrium filix-femina* | lady fern | | | Athyriaceae |
| *Impatiens capensis* | common jewelweed | | | Balsaminaceae |
| *Betula populifolia* | gray birch | | | Betulaceae |
| *Myosotis scorpioides* | common forget-me-not | | | Boraginaceae |
| *Alliaria petiolata* | garlic mustard | | | Brassicaceae |
| *Lonicera tatarica* | Tartarian honeysuckle | | | Caprifoliaceae |

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## Rare, Threatened and Endangered Plant Inventory

Report Date: 5/5/2020

| Plant Name | Common Name | S-Rank* | T/E | Plant Family |
|---|---|---|---|---|
| *Silene vulgaris* | common bladder campion | | | Caryophyllaceae |
| *Celastrus orbiculatus* | Oriental bittersweet | | | Celastraceae |
| *Calystegia sepium* | hedge bindweed | | | Convolvulaceae |
| *Cornus racemosa* | gray dogwood | | | Cornaceae |
| *Echinocystis lobata* | wild cucumber | | | Cucurbitaceae |
| *Carex annectens* | foxtail sedge | | | Cyperaceae |
| *Carex gracillima* | slender sedge | | | Cyperaceae |
| *Carex pensylvanica* | Pennsylvania sedge | | | Cyperaceae |
| *Carex cf scoparia* | broom sedge | | | Cyperaceae |
| *Cyperus lupulinus* | hop flat-sedge | | | Cyperaceae |
| *Scirpus atrovirens* | dark bulrush | | | Cyperaceae |
| *Polystichum acrostichoides* | Christmas fern | | | Dryopteridaceae |
| *Equisetum arvense* | field horsetail | | | Equisetaceae |
| *Lotus corniculatus* | bird's-foot trefoil | | | Fabaceae |
| *Trifolium pratense* | red clover | | | Fabaceae |
| *Trifolium repens* | white clover | | | Fabaceae |
| *Vicia cracca* | cow vetch | | | Fabaceae |
| *Iris versicolor* | blue flag | | | Iridaceae |
| *Juglans cinerea* | butternut | | | Juglandaceae |
| *Juncus effusus* | soft rush | | | Juncaceae |
| *Juncus tenuis* | path rush | | | Juncaceae |
| *Luzula multiflora* | common wood rush | | | Juncaceae |
| *Galeopsis tetrahit* | dead hemp-nettle | | | Lamiaceae |
| *Glechoma hederacea* | gill-over-the-ground | | | Lamiaceae |
| *Prunella vulgaris* | self-heal | | | Lamiaceae |
| *Scutellaria sp.* | skullcap | | | Lamiaceae |
| *Stachys palustris* | woundwort | | | Lamiaceae |
| *Lythrum salicaria* | purple loosestrife | | | Lythraceae |
| *Tilia americana* | basswood | | | Malvaceae |
| *Fraxinus americana* | white ash | | | Oleaceae |
| *Circaea canadensis* | tall enchanter's nightshade | | | Onagraceae |
| *Matteuccia struthiopteris* | ostrich fern | | | Onocleaceae |
| *Onoclea sensibilis* | sensitive fern | | | Onocleaceae |
| *Osmunda claytoniana* | interrupted fern | | | Osmundaceae |
| *Oxalis stricta* | tall yellow wood-sorrel | | | Oxalidaceae |
| *Pinus strobus* | white pine | | | Pinaceae |
| *Plantago lanceolata* | buckhorn plantain | | | Plantaginaceae |

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## Rare, Threatened and Endangered Plant Inventory

Report Date: 5/5/2020

| Plant Name | Common Name | S-Rank* | T/E | Plant Family |
|---|---|---|---|---|
| *Platanus occidentalis* | sycamore | | | Platanaceae |
| *Bromus inermis* | Hungarian brome | | | Poaceae |
| *Dactylis glomerata* | orchard grass | | | Poaceae |
| *Dichanthelium clandestinum* | deer-tongue | | | Poaceae |
| *Digitaria ischaemum* | smooth crabgrass | | | Poaceae |
| *Elymus repens* | witch grass | | | Poaceae |
| *Eragrostis frankii* | Frank's love-grass | S3 | | Poaceae |
| *Lolium perenne* | perennial rye-grass | | | Poaceae |
| *Panicum capillare* | old witch-grass | | | Poaceae |
| *Panicum dichotomiflorum* | smooth witch grass | | | Poaceae |
| *Phalaris arundinacea* | reed canary grass | | | Poaceae |
| *Phleum pratense* | Herd's grass | | | Poaceae |
| *Schedonorus arundinaceus* | tall fescue | | | Poaceae |
| *Schizachyrium scoparium* | little bluestem | | | Poaceae |
| *Setaria viridis* | green foxtail | | | Poaceae |
| *Fallopia japonica* | Japanese knotweed | | | Polygonaceae |
| *Persicaria sagittata* | tearthumb | | | Polygonaceae |
| *Rumex crispus* | curly dock | | | Polygonaceae |
| *Lysimachia ciliata* | fringed loosestrife | | | Primulaceae |
| *Lysimachia nummularia* | moneywort | | | Primulaceae |
| *Lysimachia quadrifolia* | four-leaved loosestrife | | | Primulaceae |
| *Ranunculus acris* | common buttercup | | | Ranunculaceae |
| *Thalictrum pubescens* | tall meadow-rue | | | Ranunculaceae |
| *Frangula alnus* | glossy buckthorn | | | Rhamnaceae |
| *Crataegus sp.* | hawthorn | | | Rosaceae |
| *Malus pumila* | wild apple | | | Rosaceae |
| *Potentilla norvegica* | rough cinquefoil | | | Rosaceae |
| *Prunus serotina* | black cherry | | | Rosaceae |
| *Prunus virginiana* | choke cherry | | | Rosaceae |
| *Rosa multiflora* | multiflora rose | | | Rosaceae |
| *Rubus idaeus* | red raspberry | | | Rosaceae |
| *Rubus odoratus* | flowering raspberry | | | Rosaceae |
| *Galium mollugo* | common bedstraw | | | Rubiaceae |
| *Populus tremuloides* | quaking aspen | | | Salicaceae |
| *Acer negundo* | box-elder | | | Sapindaceae |
| *Acer saccharum* | sugar maple | | | Sapindaceae |
| *Verbascum thapsus* | common mullein | | | Scrophulariaceae |

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## Rare, Threatened and Endangered Plant Inventory

Report Date: 5/5/2020

| Plant Name | Common Name | S-Rank* | T/E | Plant Family |
|---|---|---|---|---|
| *Ulmus americana* | American elm | | | Ulmaceae |
| *Verbena urticifolia* | white vervain | | | Verbenaceae |
| *Parthenocissus quinquefolia* | woodbine | | | Vitaceae |