Chapter 10: Energy Plan

Enhanced Energy Plan

The intent of this section is to meet the municipal determination standards for enhanced energy planning enabled in 24 V.S.A. 4352. The purpose of enhanced energy planning is to further regional and state energy goals, including the goal of having 90% of energy used in Vermont come from renewable sources by 2050 (90 x 50 goal), and the following:

A. *Vermont's greenhouse gas reduction goals under 10 V.S.A. § 578(a);*
B. *Vermont's 25 by 25 goal for renewable energy under 10 V.S.A. § 580;*
C. *Vermont's building efficiency goals under 10 V.S.A. § 581;*
D. *State energy policy under 30 V.S.A. § 202a and the recommendations for regional and municipal energy planning pertaining to the efficient use of energy and the siting and development of renewable energy resources contained in the State energy plans adopted pursuant to 30 V.S.A. §§ 202 and 202b (State energy plans); and*
E. *The distributed renewable generation and energy transformation categories of resources to meet the requirements of the Renewable Energy Standard under 30 V.S.A. §§ 8004 and 8005;*

A positive determination of compliance with the requirements of enhanced energy planning, as provided by the Regional Planning Commission, will enable Montgomery to achieve "substantial deference" instead of "due consideration" in Section 248 applications for energy generation facilities (ex. wind facilities, solar facilities, hydro facilities, etc.) under Criteria (b)(1)-Orderly Development. In short, this means that Montgomery will have a greater "say" in Certificate of Public Good proceedings before the Vermont Public Service Board about where these facilities should or should not be located in the community.

To receive a positive determination of energy compliance, an enhanced energy plan must be duly adopted, regionally approved, and must contain the following information:

A. An analysis of current energy resources, needs, scarcities, costs, and problems.
B. Targets for future energy use and generation.
C. "Pathways," or implementation actions, to help the municipality achieve the established targets.
D. Mapping to help guide the conversation about the siting of renewables.

This chapter will include the required analysis, targets, and mapping. The "pathways," or actions, have been included in the implementation section of the municipal plan.

Energy Resources, Needs, Scarcities, Costs and Problems

The following subsection reviews each energy sector of energy use (thermal, transportation, electricity) and generation in Montgomery.

Thermal Energy

An estimate of current residential thermal energy demand in Montgomery, based on data from the American Community Survey (ACS 2011-2015), is shown in Table 10.1. The data shows that 42.2% of households in Montgomery depend on fuel oil for home heating. Fuel oil and propane are estimated to

heat 63% of homes in Montgomery with wood heating an additional 37.1% of homes in Montgomery. There is no access to natural gas in Montgomery.

Table 10.1 - Current Municipal Residential Thermal Energy Use

Fuel Source	Montgomery Households (ACS 2011-2015)	Montgomery % of Households	Montgomery - Households Square Footage Heated	Municipal BTU (in Billions)
Natural Gas	0	0.0%	0	0
Propane	93	20.8%	155,248	9
Electricity	0	0.0%	0	0
Fuel Oil	189	42.2%	308,464	19
Coal	0	0.0%	0	0
Wood	166	37.1%	299,872	18
Solar	0	0.0%	0	0
Other	0	0.0%	0	0
No Fuel	0	0.0%	0	0
Total	448	100.0%	763,584	46

Estimates for commercial and industrial thermal energy use are more difficult to calculate. An estimate of total commercial energy use (thermal and electricity) is provided in Table 10.2. Based on data from the Vermont Department of Labor (VT DOL) and the Vermont Department of Public Service (VT DPS). According to NRPC, it is assumed that the majority of this energy use, 20 billion BTU per year, is likely to be for thermal energy needs.

Table 10.2 - Current Montgomery Commercial Energy Use

	Commercial Establishments in Montgomery (VT DOL)	Estimated Thermal Energy BTUs per Commercial Establishment/year (in Billions) (VT DPS)	Estimated Thermal Energy BTUs by Commercial Establishments in Montgomery/year (in Billions)
Municipal Commercial Energy Use	27	0.725	20

Electricity Use

An estimate of current electricity use in Montgomery is shown in Table 10.3. This data is from 2016 and is available from Efficiency Vermont. Montgomery electricity use has decreased since 2014 from 5.8 million kWh in 2014 to about 5.6 million kWh per year in 2016. Most of this reduction in use has come from residential accounts. According to Efficiency Vermont, the average residential usage per household has decreased from 5,951 kWh per year to 5,809 kWh per year between 2014 and 2016. Montgomery's average residential usage in 2016 was more than 1,000 kWh lower than the average regional residential kWh use. Some of this lower use could be due to the relatively high number of seasonal dwellings in Montgomery that do not use electricity year-round.

Montgomery is served by one electric utility: Vermont Electric Cooperative.

Table 10.3 - Current Montgomery Electricity Use

Use Sector	Current Electricity Use in Montgomery - 2016 (Efficiency Vermont)	Current Electricity Use (in Billion BTUs)
Residential (kWh)	4,194,405	14.3
Commercial and Industrial (kWh)	1,483,465	5
Total (kWh)	5,677,870	19.3

Table 10.4 - Current Municipal Transportation Energy Use

Transportation Data	Municipal Data
Total # of Passenger Vehicles (ACS 2011-2015)	857
Average Miles per Vehicle (VTrans)	11,356
Total Miles Traveled	9,732,092
Realized MPG (2013 - VTrans 2015 Energy Profile)	18.6
Total Gallons Use per Year	523,231
Transportation BTUs (Billion)	63
Average Cost per Gallon of Gasoline in 2016 (NRPC)	$2.31
Gasoline Cost per Year	$1,208,663

Table 10.5 – Existing Renewable Electricity Generation

Generation Type	MW	MWh
Solar	0.07	85.85
Wind	0.00	0.00
Hydro	0.00	0.00
Biomass	0.00	0.00
Other	0.00	0.00
Total Existing Generation	0.07	85.85

Transportation

Table 10.4 contains an estimate of transportation energy use in Montgomery. It's estimated that Montgomery residents drive approximately 9.7 million miles per year and spend about $1.2 million on transportation fuel expenses a year. This calculation does not include expense for commercially owned and operated vehicles.

Electricity Generation

There is currently .07 MW of electricity generation capacity from renewable generation facilities in Montgomery. This capacity results in approximately 85.85 MWh of electricity generation per year. This is roughly equal to the annual electricity use of about 12 households in Vermont based on information available from the U.S. Energy Information Administration (558 kWh per VT household per month). This ranks Montgomery among the lowest regionally in electricity generation.

Table 10.5 organizes information about existing generation in Montgomery by type of facility. Map X.X shows the location of all electricity generators in Montgomery with a capacity greater than 15 kW.

Commented [NN1]: Insert

Montgomery generally has limited access to electricity transmission lines and three-phase distribution lines. This type of infrastructure is only available on state routes VT 118 and VT 242. These types of electrical lines are used to transmit large quantities of electricity and are needed to serve large industrial users and commercial centers. Map X.X shows the electricity transmission and three-phase distribution

Commented [NN2]: insert

infrastructure in Montgomery. Access to renewable generation resources, such as solar and wind, will be addressed below in the mapping section.

Targets for Use and Generation

Northwest Regional Planning Commission worked with the Vermont Energy Investment Corporation (VEIC) and the Vermont Department of Public Service in 2016 to develop regional targets for future energy use and generation to meet the State of Vermont's 90 x 50 goal. The targets represent only one scenario that would meet this goal. There may be many different ways that would also enable Vermont to achieve the 90 x 50 goal. For more information about the regional targets, please see the Northwest Regional Energy Plan (www.nrpcvt.com).

Tables 10.6, 10.7 and 10.8 show the targets for future energy use for Montgomery by sector (totals are cumulative). These municipal targets are based on regional targets that have been disaggregated.

The thermal targets for Montgomery in 2050 is to have 85.8% of structures be heated by renewable sources. Much of this transition is likely to come in the form of electric heat pumps as the primary heating source for single family homes as the technology becomes more readily available and affordable. The target also relies on wood heating being a continued source of residential heating. There are also high targets for the weatherization of residential households and commercial structures (78% and 73% respectively in 2050).

Table 10.6 - Thermal Targets

Thermal Targets	2025	2035	2050
Percent of Total Heating Energy From Renewable Sources - Heating (BTUs)	44.8%	58.0%	85.8%
New Efficient Wood Heat Systems (in units)	0	0	3
New Heat Pumps (in units)	54	123	230
Percentage of municipal households to be weatherized	5%	16%	78%
Percentage of commercial establishments to be weatherized	25%	25%	73%

Commented [NN3]: Do you want to smooth this curve?

The transportation energy targets for Montgomery are similarly ambitious. By 2050, 91.1% of transportation energy is targeted to come from renewable sources. This will primarily be done through conversion to electric vehicles from fossil fuel vehicles for light-duty, passenger vehicles. However, it will also mean conversion of heavy-duty vehicles from diesel to biodiesel sources. The biodiesel technology and infrastructure will certainly need to advance and evolve in order to meet this target.

Table 10.7 - Transportation Targets

Transportation Targets	2025	2035	2050
Percent of Total Transportation Energy from Renewable Sources - Transportation (BTUs)	11.0%	33.6%	91.1%
Electric Vehicles	75	562	1336
Biodiesel Vehicles	165	330	638

Targets for electricity use are more complex to interpret. Electricity use is targeted to double by 2050 (Table 10.8). This will likely be driven by conversions to electric heat pumps and electric vehicles. These

consumer changes will cause electricity use to grow. At the same time, total energy use (energy, not electricity) will become more efficient. This is because electric cars and electric heating sources are more efficient than using other energy sources, such as fossil fuels.

Table 10.8 - Electricity Targets

Electricity Targets	2025	2035	2050
Electricity Use Growth (Efficiency and Conservation in BTUs)	25.2%	48.3%	100.7%

Table 10.9 shows the electricity generation targets for Montgomery in 2025, 2035, and 2050. All new wind, solar, hydro, and biomass electricity generation sites will further progress towards achieving the generation targets (in MWh). Given the difficulty of developing additional hydro generation, and the constraints upon wind development, it is likely that solar generation will need to be a substantial component of meeting these generation targets. Meeting the generation targets will take considerable effort over the next 30 to 35 years. The 2050 generation target (9,312.9 MWh) is about 100 times larger than the current generation capacity (85.85 MWh) within the Town of Montgomery.

Table 10.9 – Generation Targets

Renewable Generation Targets	2025	2035	2050
Total Renewable Generation Target (in MWh)	3,073.3	6,146.5	9,312.9

Montgomery has sufficient land and access to renewable electricity sources to meet the above generation targets. Based on mapping and calculations completed by NRPC, Montgomery has access to the generation capacity outlined in Table 10.10. This generation capacity was calculated using the "base" layers for solar and wind. For an explanation of what constitutes a "base" layer, please see the mapping subsection below.

Table 10.10 - Renewable Electricity Generation Potential

Resource	MW	MWh
Rooftop Solar	1	715
Ground-mounted Solar	231	282,738
Wind	38	117,451
Hydro	0	0
Biomass and Methane	0	0
Other	0	0
Total Renewable Generation Potential	269	400,904

Montgomery supports NRPC's position regarding "commercial" and "industrial" wind facilities. The NRPC Regional Plan finds that the construction of new "industrial" or "commercial" wind facilities within the region does not conform to the Regional Plan (NRPC considers any wind facility with a tower height (excluding blades) in excess of 100 feet tall to be considered an "industrial" or "commercial" wind facility).

Figure 5.1 – Solar Electricity Generation Potential in Montgomery

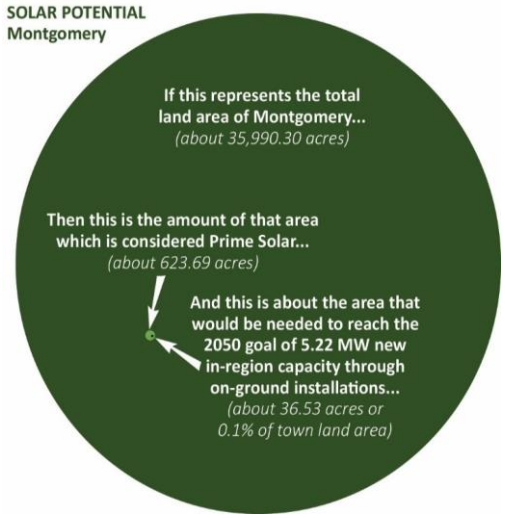


Figure 10.2 – Rooftop Solar Potential

Rooftop solar was estimated by using methods suggested by the Vermont Department of Public Service. The methodology estimates that 25% of residential and commercial structures in Montgomery could be suitable for rooftop solar generation. This results in 112 residential structures and 7 commercial structures in Montgomery. It is then estimated that the average residential rooftop system is 4 kW in size and the average commercial rooftop system is 20 kW in size. The resulting estimated generation capacity is .58 MW of solar generation. This would account for a little more than 10% to the approximately 5.22 MW from solar generation needed to hit the overall generation targets.

Deleted: X.X

Mapping Energy Resources and Constraints

Montgomery has incorporated maps provided to them by NRPC. These maps show data as required by the Department of Public Service Determination Standards, including access to energy resources and constraints to renewable development, and are a required element of enhanced energy planning. All maps may be found at the end of this section.

Commented [NN4]: Will need to change per municipality.

The intent of the maps is to generally show those areas that may be good locations, or may be inappropriate locations, for future renewable generation facilities. However, it is important to note that the maps are a planning tool and do not precisely indicate locations where siting a facility is necessarily acceptable. When a generation facility is proposed, the presence of all natural resources constraints on site shall be verified as a part of the application.

Mapping Methodology

Spatial data showing the location of energy resources formed the basis of the maps developed by NRPC. This is the data that shows where there is solar, wind, hydro, and biomass "potential."

"Known" and "possible" constraints were subsequently identified on the maps. Known constraints are conservation resources that shall be protected from all future development of renewable generation

facilities. Possible constraints are conservation resources that shall be protected, to some extent, from the development of renewable generation facilities. The presence of possible constraints on land does not necessarily impede the siting of renewable generation facilities on a site. Siting in these locations could occur if impacts to the affected possible constraints are mitigated, preferably on-site.

A full list of known and possible constraints included on the maps is located in Table 10.11. The known constraints and possible constraints used to create the maps include constraints that are required per the State Determination Standards from the Department of Public Service and regional constraints that were selected by NRPC. The Forest Reserve and the Protected District for Montgomery and Enosburg Falls were included as regional possible constraints.

Solar and Wind

The solar and wind maps show both "base" and "prime" areas. Base areas are areas with generation potential, yet may contain possible constraints. Prime areas are areas that have generation potential that do not contain known or possible constraints. Areas that do not contain generation potential, and areas that contain a known constraint, are shown as white space on the map.

Montgomery has fairly limited solar resources compared to other municipalities in the region. This is due primarily to its mountainous terrain. The solar map indicates a general concentration of prime and base solar areas along VT Route 242 towards Westfield and Jay. Montgomery has identified the following preferred locations for solar generation facilities: rooftops, parking lots, and landfills. Brownfield sites located outside of the village are also considered preferred locations.

Commented [NN5]: Any additional sites?

Montgomery has a strong preference for solar facilities that have less than 5 MW in generation capacity. This preference is a reflection of the community's dedication to preserving the aesthetic and rural qualities of Montgomery by restricting the geographic size of solar facilities. In addition, Montgomery prefers that solar facilities greater than 150 kW in generation capacity to be sufficiently separated from other similarly sized solar facilities to "break up" the visual impact of two or more solar facilities located next to each other. All solar facilities shall include proper screening. Montgomery hopes to adopt a municipal solar screening ordinance in the near future.

There generally isn't much land available in Montgomery that has base and prime wind resources. These areas are generally are concentrated off Hazen's Notch Road, but are small in size. There are considerable wind resources available in neighboring communities, notably Westfield.

Hydro and Biomass

The biomass map is somewhat similar to the solar and wind maps. The biomass map also displays "base" and "prime" areas. However, these categories are not necessarily indicative of generation. They instead indicate areas of contiguous forest that may be used for the harvesting of woody biomass for use in either thermal or electric generation.

The hydro map is unique from the other types of generation maps. It shows existing dam sites used for electricity generation. It also shows existing dam sites that are not used for electricity generation, but could be retrofitted to provide generation capacity. Data about these dams comes from a study commissioned by the Vermont Agency of Natural Resources. The hydro map also shows some known and possible constraints that could impact the redevelopment of some dam sites.

Montgomery does not have any existing dam sites. Future hydro development would be difficult given that the largest river in Montgomery, the Trout River, is a Designated National Wild and Scenic River.

Conclusion

Achieving the 90 x 50 goal, and the other energy goals in state statute, will be difficult. Montgomery is committed to playing its part in working towards accomplishing these goals and in creating a more sustainable, less costly, and more secure energy future.

Goals

- Plan for increased electric demand with the support of Efficiency Vermont and local electric utilities.
- Reduce annual fuel needs and fuel costs for heating structures, to foster the transition from non-renewable fuel sources to renewable fuel sources, and to maximize the weatherization of residential households and commercial establishments.
- Hold vehicle miles traveled per capita to 2011 levels through reducing the amount of single occupancy vehicle (SOV) commute trips, increasing the amount of pedestrian and bicycle commute trips, and increasing public transit ridership.
- Focus growth within and adjacent to the villages.

Policies

- Montgomery supports energy conservation efforts and the efficient use of energy across all sectors.
- Montgomery supports the reduction of transportation energy demand, reduction of single-occupancy vehicle use, and the transition to renewable and lower-emission energy sources for transportation.
- Montgomery supports patterns and densities of concentrated development that result in the conservation of energy. This includes support of public transit connections from Montgomery to other parts of the region and considering access to public transit when reviewing Act 250 applications.
- Montgomery supports the development and siting of renewable energy resources in the Town that are in conformance with the goals, strategies, and mapping outlined in this plan. This includes language in the above mapping section about the preferred size and colocation of solar facilities. Development of generation in identified preferred locations shall be favored over the development of other sites.
- Montgomery supports the conversion of fossil fuel heating to advanced wood heating systems or electric heat pumps.
- Montgomery will support local farms and the local food system.

Implementation Actions

- Coordinate with Efficiency Vermont and state low-income weatherization programs to encourage residents to participate in weatherization programs available to Montgomery residents.
- Promote the use of the residential and commercial building energy standards by distributing code information to permit applicants.

- Create an Energy Committee and/or appoint an Energy Coordinator to coordinate energy-related planning and projects in Montgomery.
- Investigate a revision to the zoning bylaw that would incentivize compliance with the state's stretch code, or similarly high environmental standard, through the issuance of a bonus density.
- Conduct an energy audit of municipal buildings to identify weatherization retrofits and incorporate the recommendations into the municipal capital budget.
- Identify areas that may be appropriate for a wood-fired district heating facility.
- Promote and provide information about the GoVermont website which provides information citizens about ride share, vanpool, and park-and-ride options.
- Study creation of public transit routes in Montgomery.
- Plan for and install electric vehicle charging infrastructure on municipal property.
- Review municipal road standards to ensure that they reflect the "complete streets" principles.
- Review local policies and ordinances to limit water and sewer services to those areas of town where additional development will not contribute to sprawl.
- Investigate the installation of a municipal solar and/or wind net-metering facilities to off-set municipal electric use.
- Investigate installation of a community-based renewable energy project.
- Provide firefighters with training in fighting fires on structures that have solar panels installed.

Table 10.11 – Mapping Constraints

Solar, Wind and Biomass Maps - Known Constraints

Constraint	Description	Source
Confirmed and unconfirmed vernal pools	There is a 600-foot buffer around confirmed or unconfirmed vernal pools.	ANR
State Significant Natural Communities and Rare, Threatened, and Endangered Species	Rankings S1 through S3 were used as constraints. These include all of the rare and uncommon rankings within the file. For more information on the specific rankings, explore the methodology for the shapefile.	VCGI
River corridors	Only mapped River Corridors were mapped. Does not include 50 foot buffer for streams with a drainage area less than 2 square miles.	VCGI
National wilderness areas		VCGI
FEMA Floodways		VCGI/NRPC
Class 1 and Class 2 Wetlands		VCGI
Designated Downtowns, Designated Growth Centers, and Designated Village Centers	These areas are the center of dense, traditional development in the region. This constraint does not apply to roof-mounted solar within such designated areas. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Northwest Regional Plan.	NRPC

FEMA Flood Insurance Rate Map (FIRM) special flood hazard areas	Special flood hazard areas as digitized by the NRPC were used (just the 100-year flood plain - 500-year floodplain not mapped). The inclusion of this resource as a regional constraint is consistent with goals and policies of the Northwest Regional Plan.	NRPC
Ground and surface waters drinking protection areas	Buffered Source Protection Areas (SPAs) are designated by the Vermont Department of Environmental Conservation (DEC). SPA boundaries are approximate but are conservative enough to capture the areas most susceptible to contamination. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Northwest Regional Plan.	ANR
Vermont Conservation Design Highest Priority Forest Blocks	The lands and waters identified here are the areas of the state that are of highest priority for maintaining ecological integrity. Together, these lands comprise a connected landscape of large and intact forested habitat, healthy aquatic and riparian systems, and a full range of physical features (bedrock, soils, elevation, slope, and aspect) on which plant and animal natural communities depend. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Northwest Regional Plan. (Source: ANR)	ANR
Public water sources	A 200-foot buffer is used around public drinking water wellheads. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Northwest Regional Plan.	ANR
National Natural Landmark – Chazy Fossil Reef	The Chazy Fossil Reef in Isle La Motte has been designated a National Natural Landmark by the US Department of Interior.	NRPC
Municipal Conservation Land Use Areas	Conservation Land Use Districts, as designated in municipal plans, that include strict language that strongly deters or prohibits development have been included as a regional known constraint. The inclusion of this resource as a regional constraint is consistent with the goals and policies of the Northwest Regional Plan. The Montgomery Conservation District II is included in this category.	NRPC
Solar, Wind and Biomass Maps - Possible Constraints		
Constraint	**Description**	**Source**

Protected lands	This constraint includes public lands held by agencies with conservation or natural resource oriented missions, municipal natural resource holdings (ex. Town forests), public boating and fishing access areas, public and private educational institution holdings with natural resource uses and protections, publicly owned rights on private lands, parcels owned in fee by non-profit organizations dedicated to conserving land or resources, and private parcels with conservation easements held by non-profit organizations.	VCGI
Deer wintering areas	Deer wintering habitat as identified by the Vermont Agency of Natural Resources.	ANR
Hydric soils	Hydric soils as identified by the US Department of Agriculture.	VCGI
Agricultural soils	Local, statewide, and prime agricultural soils are considered.	VCGI
Act 250 Agricultural Soil Mitigation Areas	Sites conserved as a condition of an Act 250 permit.	VCGI
Class 3 wetlands	Class 3 wetlands in the region have been identified have been included as a Regional Possible Constraint. The inclusion of this resource as a regional constraint is consistent with goals and policies of the Northwest Regional Plan.	ANR
Municipal Conservation Land Use Areas	Conservation Land Use Districts, as designated in municipal plans, that include strict language that deters, but does not prohibit development, have been included as a regional possible constraint. The Montgomery Conservation District I is included in this category.	NRPC
Hydro Map - Known Constraints		
Constraint	**Description**	**Source**
National scenic and recreational rivers	Upper Missisquoi and Trout Rivers.	BCRC/NRPC
Hydro Map - Possible Constraints		
Constraint	**Description**	**Source**
"303d" list of stressed waters		ANR
Impaired waters		ANR
State Significant Natural Communities and Rare, Threatened, and Endangered Species	Rankings S1 through S3 were used as constraints. These include all of the rare and uncommon rankings within the file. For more information on the specific rankings, explore the methodology for the shapefile.	VCGI

Table 10.12 - Montgomery Electricity Generators (12.28.17)							
Category	Sub Category	Name	Address	CPG Number	Electricity Type	Utility	Capacity kW
Solar	Ground-mounted PV	Andre LaBier	219 Rossier Rd	2611	Net Metered	Vermont Electric Coop	8.2
Solar	Ground-mounted PV	Arnold & Linda Mercy	2637 South Main Street		Net Metered	Vermont Electric Coop	7.6
Solar	Roof-Mounted PV	Curt & Lisa Perry	1325 Regan Rd	3248	Net Metered	Vermont Electric Coop	4
Solar	Ground-mounted PV	Jacob Racusin	2812 Black Falls Road	372	Net Metered	Vermont Electric Coop	1.3
Solar	Ground-mounted PV: Tracker	Kevin Sorin	854 Rushford Valley Rd		Net Metered	Vermont Electric Coop	12
Solar	Roof-Mounted PV	Sarah Cushing	1427 Regan Road	812	Net Metered	Vermont Electric Coop	3.2
Solar	Ground-mounted PV	Scott & Sharon Perry	3592 Hazens Notch Rd	3801	Net Metered	Vermont Electric Coop	9
Solar	Roof-Mounted PV	Suzanne Pelletier	169 Fuller St	3709	Net Metered	Vermont Electric Coop	4.6
Solar	Roof-Mounted PV	Justin Dennis	3376 Mountain Rd	7170	Net Metered	Vermont Electric Coop	8
Solar	Roof-Mounted PV	Titus & Jane Presler	2534 Hill West Rd	6981	Net Metered	Vermont Electric Coop	5
Solar	Roof-Mounted PV	Titus Presler & Michelle Schaap	2060 N Main Street	7291	Net Metered	Vermont Electric Coop	6

Utility Service Areas

Montgomery, Vermont
Act 174
The Energy Development Improvement Act of 2016

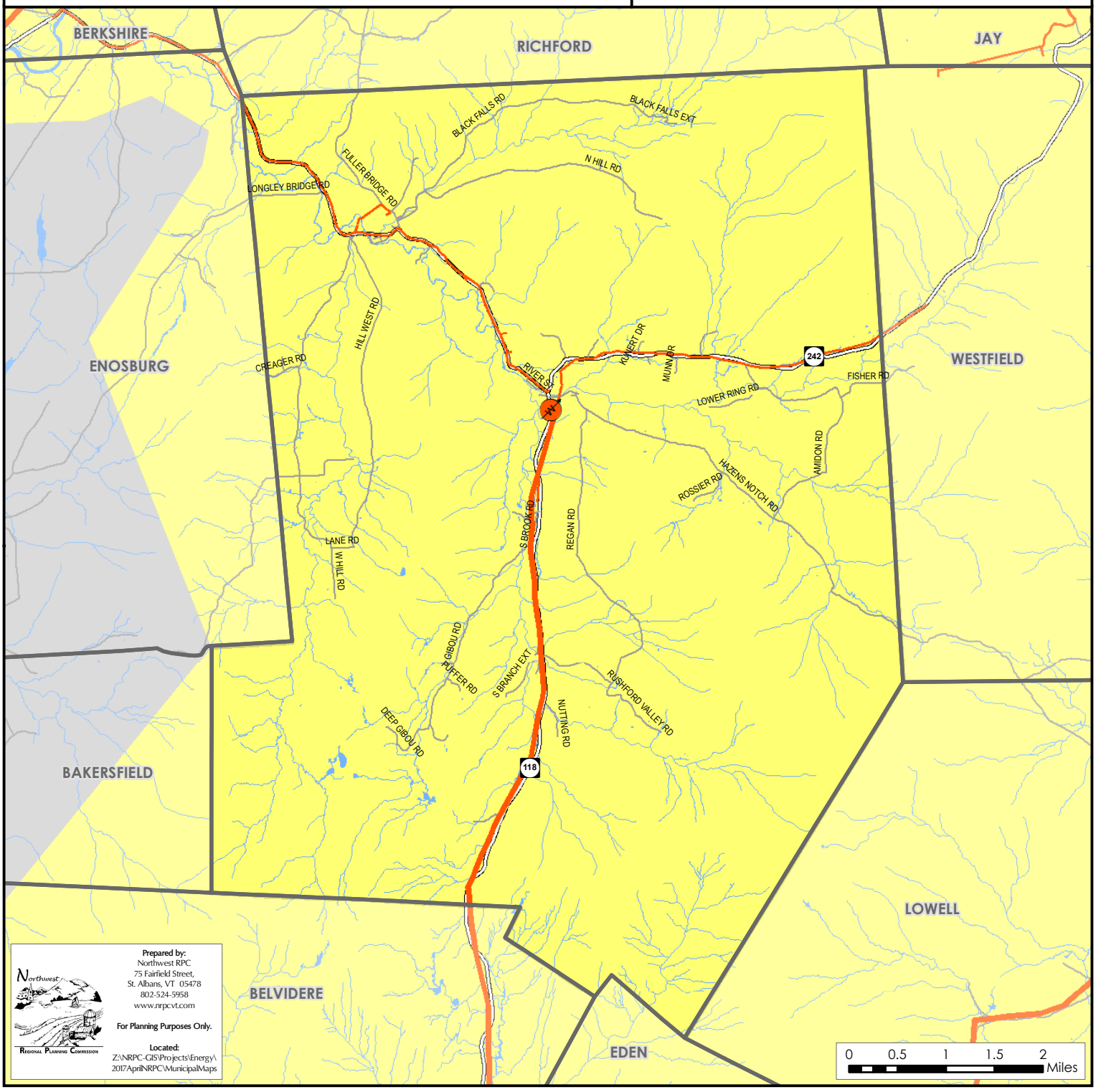
This map and the corresponding data is intended to be used to inform energy planning efforts by municipalities and regions. This may also be used for conceptual planning or initial site identification by those interested in developing renewable energy infrastructure. The maps do **NOT** take the place of site-specific investigation for a proposed facility and cannot be used of as "siting maps."

Legend

Utility Service Area Features

- Green Mountain Power
- Swanton Village Electric
- Vermont Electric Co-op
- Enosburg Falls Electric
- Substation
- 3 Phase Power Line
- Transmission Line

Sources: VCGI
Disclaimer: The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Northwest RPC is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.



Prepared by:
Northwest RPC
75 Fairfield Street,
St. Albans, VT 05478
802-524-5958
www.nrpcvt.com

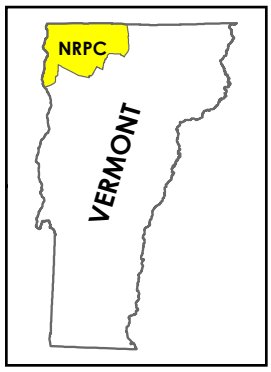
For Planning Purposes Only.

Located:
Z:\NRPC-GIS\Projects\Energy\2017April\NRPC\MunicipalMaps

Transmission & 3 Phase Power Infrastructure

Montgomery, Vermont
Act 174
The Energy Development Improvement Act of 2016

This map and the corresponding data is intended to be used to inform energy planning efforts by municipalities and regions. This may also be used for conceptual planning or initial site identification by those interested in developing renewable energy infrastructure. The maps do **NOT** take the place of site-specific investigation for a proposed facility and cannot be used of as "siting maps."



Legend

- Substation
- 3 Phase Power Line
- Transmission Line
- 1/2 Mile Buffer (3 Phase Power Line & Transmission Line)

Sources: VCGI
Disclaimer: The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Northwest RPC is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.

BERKSHIRE
RICHFORD
JAY
ENOSBURG
WESTFIELD
BAKERSFIELD
BELVIDERE
LOWELL
EDEN
BLACK FALLS RD
BLACK FALLS EXT
N HILL RD
LONGLEY BRIDGE RD
FULLER BRIDGE RD
HILL WEST RD
CREAGER RD
RIVER ST
KUVERT DR
MUNN BR
242
FISHER RD
LOWER RING RD
AMIDON RD
ROSSIER RD
HAZENS NOTCH RD
LANE RD
W HILL RD
S BROOK RD
REGAN RD
GIBOU RD
MUFFER RD
S BRANCH EXT
NULTING RD
RUSHFORD VALLEY RD
DEEP GIBOU RD
118

Prepared by:
Northwest RPC
75 Fairfield Street,
St. Albans, VT 05478
802-524-5958
www.nrpcvt.com

For Planning Purposes Only.

Located:
Z:\NRPC-GIS\Projects\Energy\2017AprilNRPC\MunicipalMaps

0 0.5 1 1.5 2 Miles

Existing Generation Facilities

Montgomery, Vermont
Act 174
The Energy Development Improvement Act of 2016

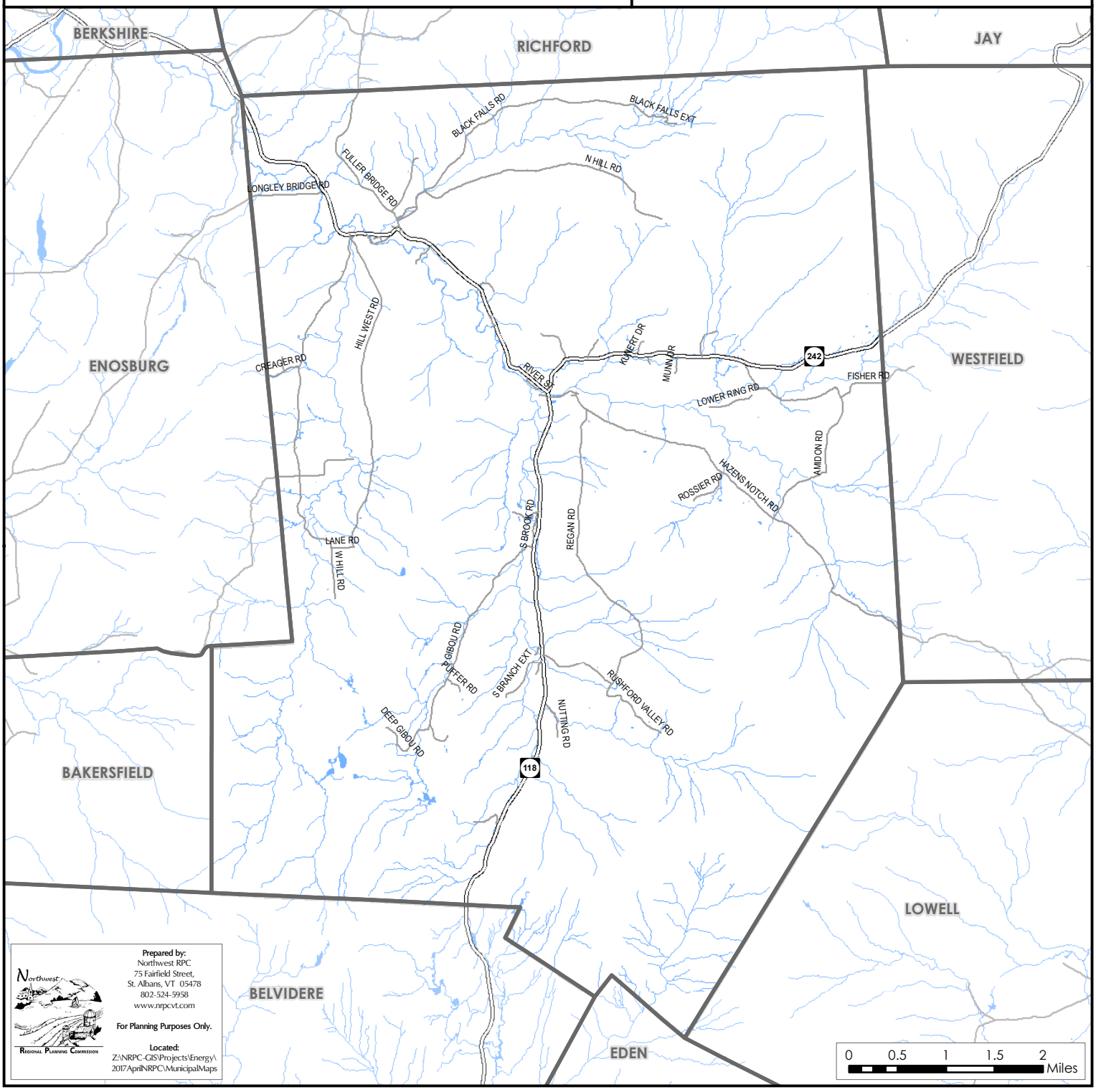
This map and the corresponding data is intended to be used to inform energy planning efforts by municipalities and regions. This may also be used for conceptual planning or initial site identification by those interested in developing renewable energy infrastructure. The maps do **NOT** take the place of site-specific investigation for a proposed facility and cannot be used of as "siting maps."

Legend

- Biomass Facility
- Hydro Facility
- Solar Facility
- Wind Facility

Note: Only generators 15kW are shown on the map. A full list of all generators is available.

Sources: VCGI
Disclaimer: The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Northwest RPC is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.



Prepared by:
Northwest RPC
75 Fairfield Street,
St. Albans, VT 05478
802-524-5958
www.nrpcvt.com

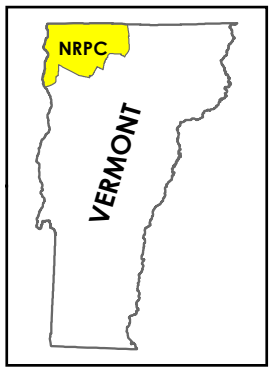
For Planning Purposes Only.

Located:
Z:\NRPC-GIS\Projects\Energy\2017April\NRPC\MunicipalMaps

Solar

Montgomery, Vermont
Act 174
The Energy Development Improvement Act of 2016

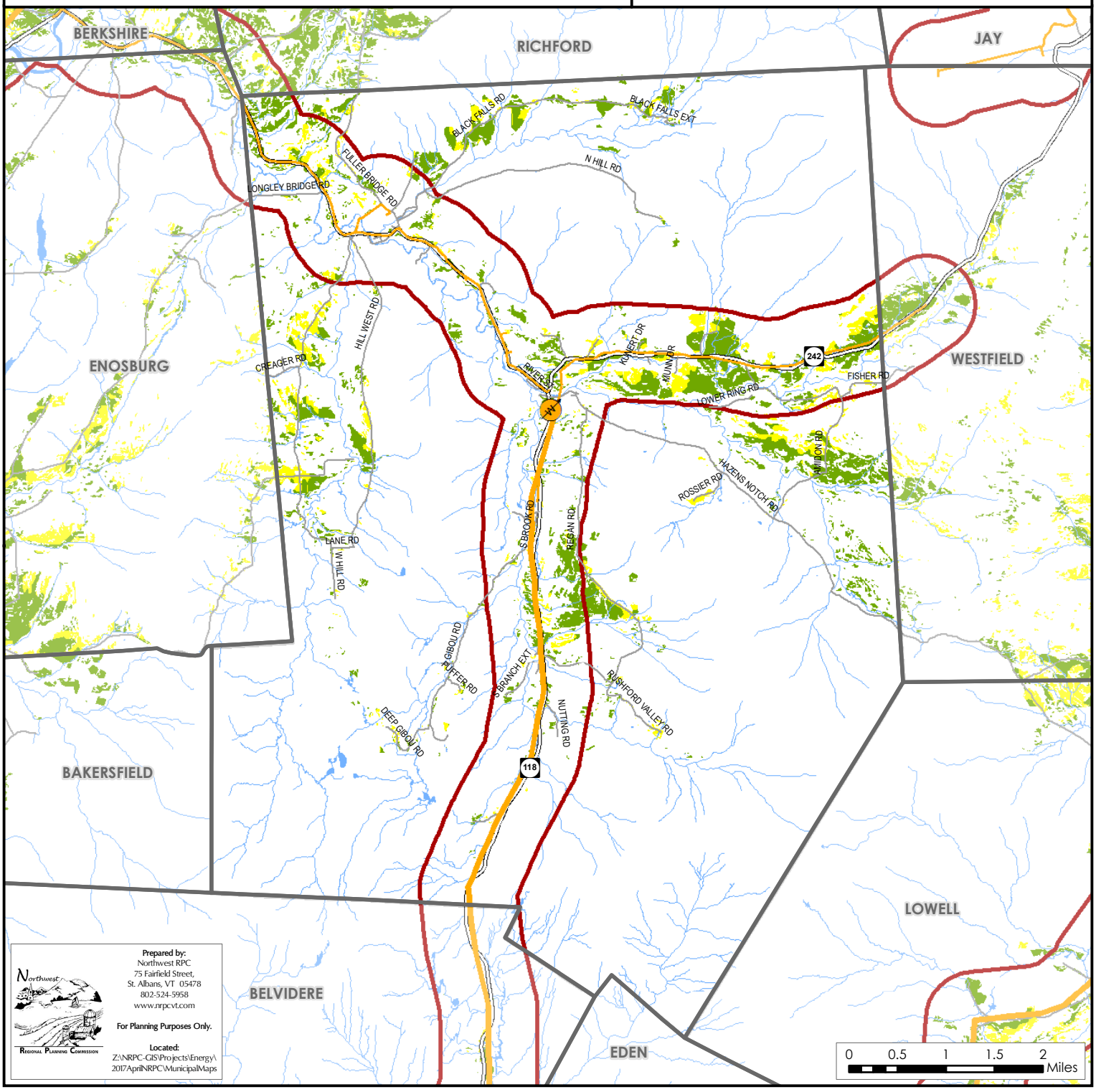
This map and the corresponding data is intended to be used to inform energy planning efforts by municipalities and regions. This may also be used for conceptual planning or initial site identification by those interested in developing renewable energy infrastructure. The maps do **NOT** take the place of site-specific investigation for a proposed facility and cannot be used of as "siting maps."



Legend

- Substation
- 3 Phase Power Line
- Transmission Line
- 1/2 Mile Buffer (3 Phase Power Line & Transmission Line)
- Prime Solar/No Known Constraints
- Base Solar/Possible Constraints

Sources: VCGI
Disclaimer: The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Northwest RPC is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.



Prepared by:
Northwest RPC
75 Fairfield Street,
St. Albans, VT 05478
802-524-5958
www.nrpcvt.com

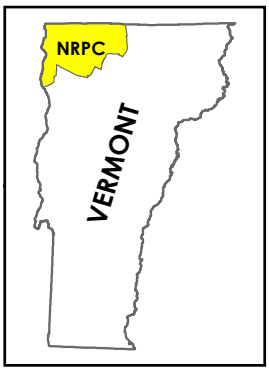
For Planning Purposes Only.

Located:
Z:\NRPC-GIS\Projects\Energy\2017April\NRPC\MunicipalMaps

Wind

Montgomery, Vermont
Act 174
The Energy Development Improvement Act of 2016

This map and the corresponding data is intended to be used to inform energy planning efforts by municipalities and regions. This may also be used for conceptual planning or initial site identification by those interested in developing renewable energy infrastructure. The maps do **NOT** take the place of site-specific investigation for a proposed facility and cannot be used of as "siting maps."



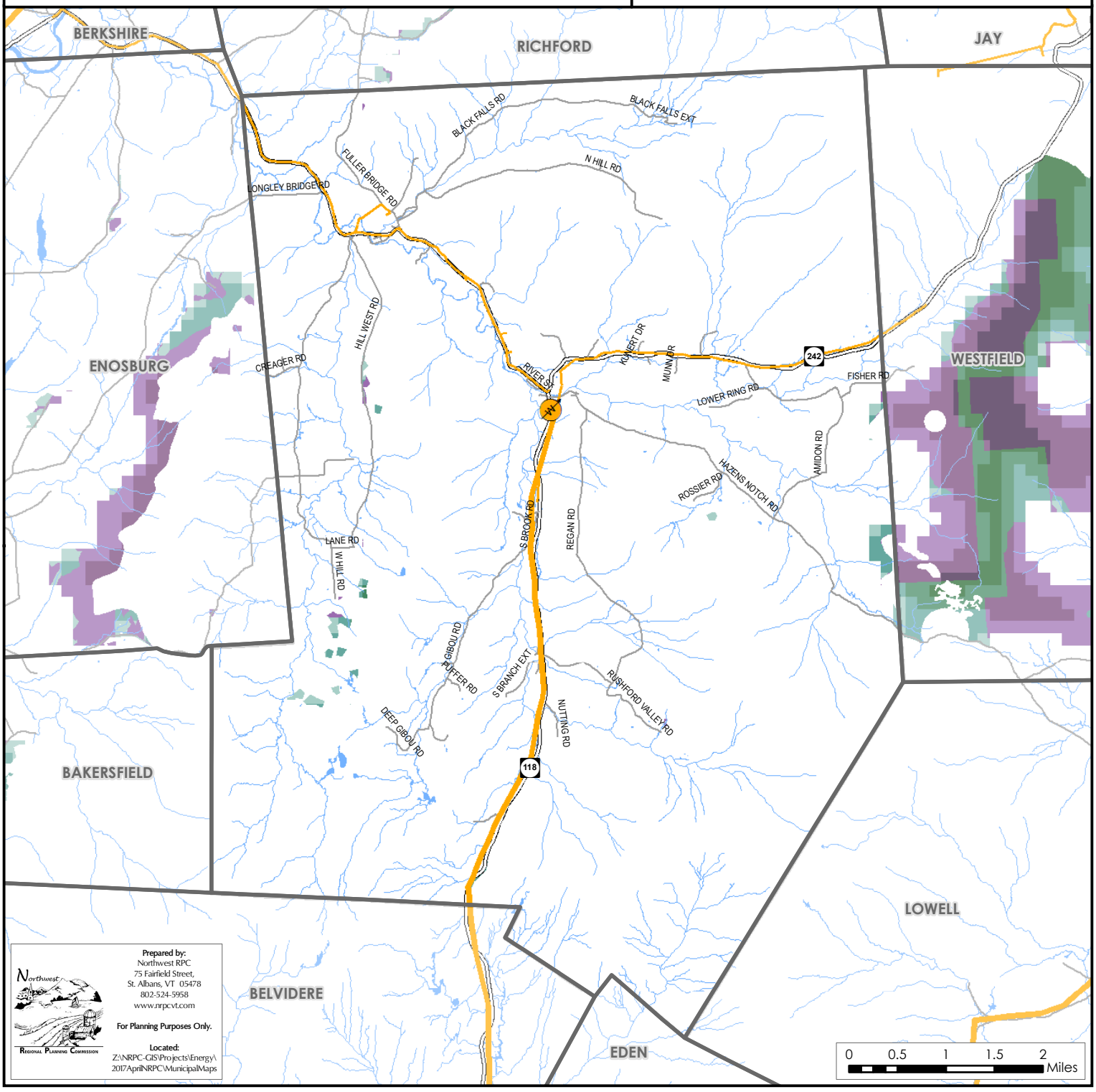
Legend

- Substation
- 3 Phase Power Line
- Transmission Line

Prime Wind
Areas of high wind potential and no known constraints.
Darker areas have higher wind speeds.

Base Wind
Areas of high wind potential and a presence of possible constraints.
Darker areas have higher wind speeds.

Sources: VCGI
Disclaimer: The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Northwest RPC is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.



Woody Biomass

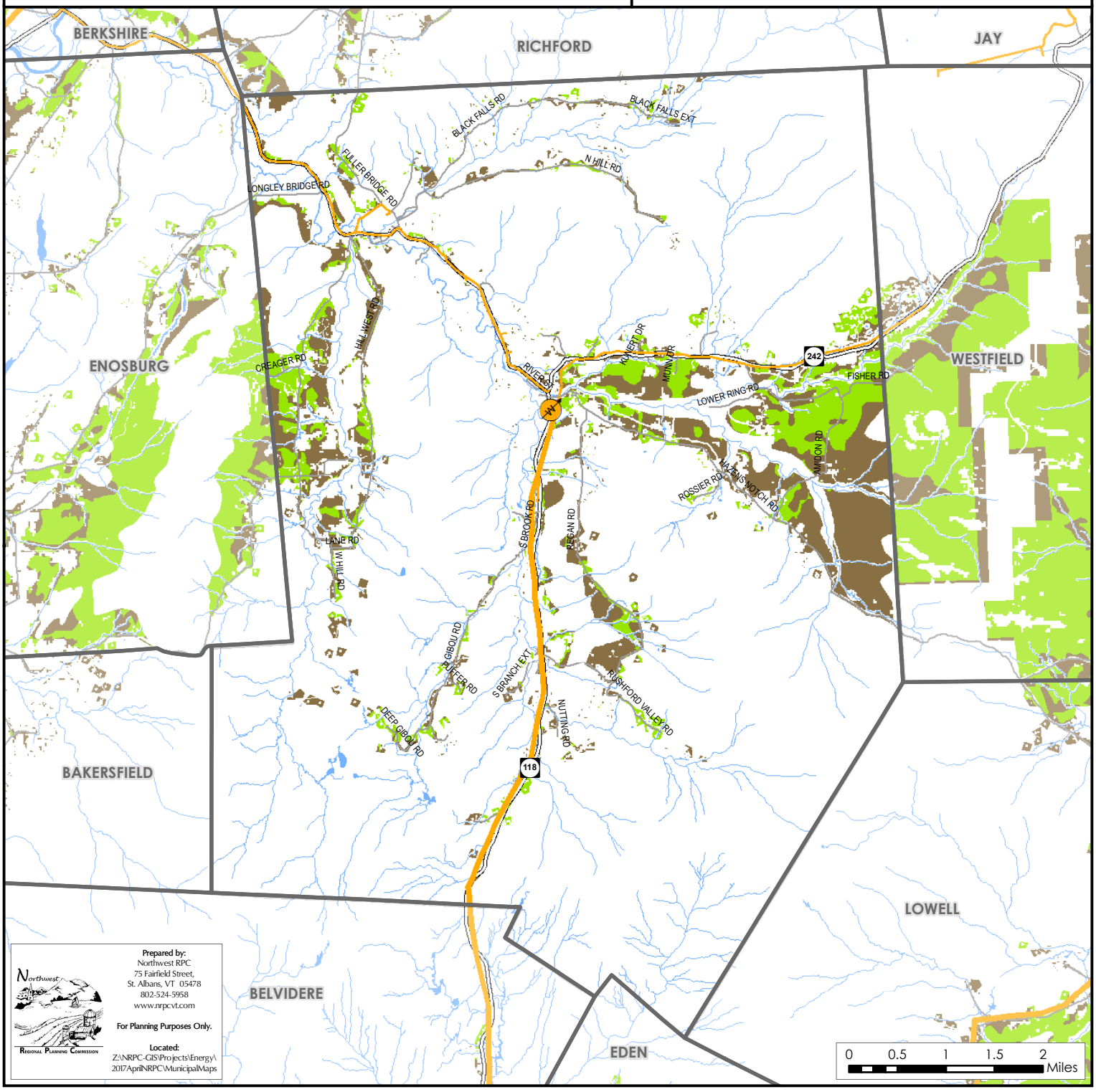
Montgomery, Vermont
Act 174
The Energy Development Improvement Act of 2016

This map and the corresponding data is intended to be used to inform energy planning efforts by municipalities and regions. This may also be used for conceptual planning or initial site identification by those interested in developing renewable energy infrastructure. The maps do **NOT** take the place of site-specific investigation for a proposed facility and cannot be used of as "siting maps."

Legend

- Biomass System
- Cow Power
- Substation
- 3 Phase Power Line
- Transmission Line
- Prime Woody Biomass/No Known Constraints
- Base Woody Biomass/Possible Constraints

Sources: VCGI
Disclaimer: The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Northwest RPC is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.



Prepared by:
Northwest RPC
75 Fairfield Street,
St. Albans, VT 05478
802-524-5958
www.nrpcvt.com

For Planning Purposes Only.

Located:
Z:\NRPC-GIS\Projects\Energy\2017April\NRPC\MunicipalMaps

Hydro

Montgomery, Vermont
Act 174
The Energy Development Improvement Act of 2016

This map and the corresponding data is intended to be used to inform energy planning efforts by municipalities and regions. This may also be used for conceptual planning or initial site identification by those interested in developing renewable energy infrastructure. The maps do **NOT** take the place of site-specific investigation for a proposed facility and cannot be used of as "siting maps."

N

Legend

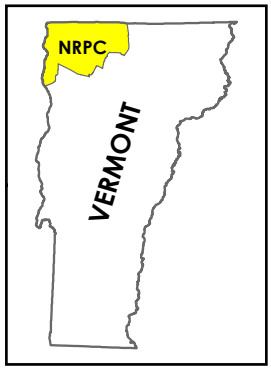
- Substation
- 3 Phase Power Line
- Transmission Line
- Designated Outstanding Resource Water
- Known Constraint - Designated National Wild & Scenic River
- Possible Constraint - Stressed or Impaired Water
- Possible Constraint - RINAs

Potential Hydroelectric Facility

- < 50 kW Capacity
- > 50 kW Capacity
- High Hazard with < 50 kW Capacity
- High Hazard with > 50 kW Capacity

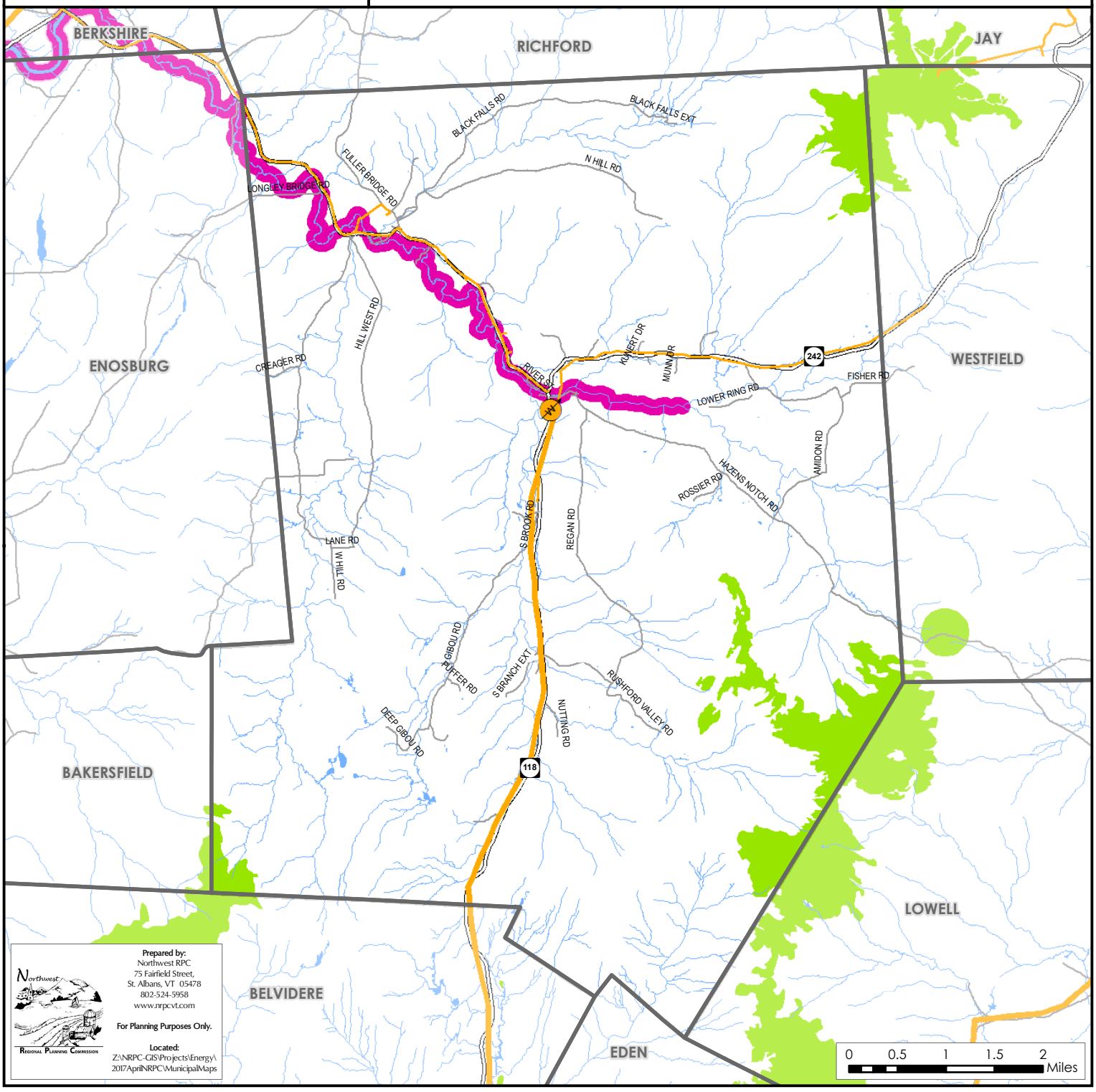
Operating Hydroelectric Facility

- Dam not on National Wild and Scenic River
- Dam on National Wild and Scenic River



Sources: VCGI

Disclaimer: The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Northwest RPC is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.



Prepared by:
Northwest RPC
75 Fairfield Street,
St. Albans, VT 05478
802-524-5958
www.nrpcvt.com

For Planning Purposes Only.

Located:
Z:\NRPC-GIS\Projects\Energy\2017AprilNRPC\MunicipalMaps