Memorandum

To: Vermont Gas Systems / Addison Natural Gas Project ("ANGP") Phase 1 Project File

Date: May 18, 2016

Project #: 57563.00

From: Meghan Lout, Environmental Scientist

Re: ANGP Phase 1 - Geprags Park/VGS ROW Vegetation and Habitat Management Plan

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The following restoration plan combines elements of the Vermont Gas Systems, Inc. ("VGS") Addison Natural Gas Project Phase 1 ("ANGP Phase 1") Vegetation Management Plan ("VMP") and the Audubon Vermont Golden-Winged Warbler Protection Plan (see Attachment 1). It is intended to provide the policy and guidance for management of the 50-foot VGS right-of-way ("ROW") through Geprags Park in Hinesburg, Vermont. VGS will cooperate with the Hinesburg Selectboard and Hinesburg Conservation Commission in its implementation and future revisions, as needed.

Introduction

At the request of VGS, VHB has prepared this memorandum to summarize vegetation and habitat management practices for the segment of the ANGP Phase 1 within Geprags Park (LLN 104) in Hinesburg, Vermont, that is a 50-foot corridor overlying the natural gas pipeline, which for maintenance and integrity reasons must be managed in a relatively open condition, similar to its present condition. As presented herein, vegetation management along the pipeline corridor within Geprags Park will be conducted so as to enhance the early successional field to forest habitat currently present. The Geprags Park/VGS ROW Vegetation and Habitat Management Plan ("GPVR VHMP") is intended to enhance and protect breeding habitat for the golden-winged warbler (*Vermivora chrysoptera*) as well as other wildlife species (such as meadow voles, fox, rabbit, etc.) that prefer this habitat type. Suitable wildlife habitat includes a mosaic of early successional species (see below) comprised of sparse trees and shrubs with an herbaceous understory of grasses and forbs[1].

Geprags Park

Geprags Park is an approximately 85.5 acre parcel located in the northwest portion of the Town of Hinesburg, Vermont. The Park is managed by the Town of Hinesburg and is composed of grassland, meadows with natural springs, shrubland, herbaceous vegetation and a mature maple-beech forest. A map of Geprags Park showing the proposed VGS ROW is available in Attachment 2. The landscape is also interspersed with small openings, which, along with hedgerows, edge habitat, and an existing overhead electric utility corridor operated by VELCO, complement the diversity of habitats found within the Park. A network of recreational trails also meander through the Park, rendering views of the Adirondacks and Green Mountains and further diversifying the landscape. VGS will coordinate with the Hinesburg Conservation Commission to assess and implement Geprags Park trails plans, including discussion of trails at the annual meeting between VGS and the Hinesburg Conservation Commission.

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[1] The Golden-winged Warbler Working Group. 2009. Information available online at www.gwwa.org.

40 IDX Drive, Building 100
Suite 200
South Burlington, VT 05403
P 802.497.6100

Land cover types within the parcel include forest (46.9 percent of the parcel), grassy areas (30.4 percent), and scrub/shrubland (22.7 percent). Soil composition within Geprags Park is provided in Table 1 and soil types within the 50-foot permanent VGS ROW within Geprags Park are provided in Table 2.

Table 1: Summary of soil types within Geprags Park

Soil Name*	Vermont Farmland Classification	Vermont Farmland Agricultural Value	Area (acres)
Geprags Park			
Belgrade and Eldridge soils, 3 to 8 percent slopes	Statewide	2	0.2
Covington silty clay	Statewide (b)	6d	26.9
Enosburg and Whately soils, 3 to 8 percent slopes	Statewide (b)	4d	7.7
Farmington extremely rocky loam, 20 to 60 percent slopes	NPSL	11	22.4
Farmington-Stockbridge rocky loams, 12 to 20 percent slopes	NPSL	9	0.7
Georgia stony loam, 3 to 8 percent slopes	Prime	3	6.6
Georgia stony loam, 8 to 15 percent slopes	Statewide	7	3.1
Georgia extremely stony loam, 0 to 15 percent slopes	NPSL	11	2.9
Georgia extremely stony loam, 15 to 60 percent slopes	NPSL	11	2.2
Limerick silt loam	Statewide (b)	4d	0.8
Livingston clay	NPSL	10	0.7
Peru extremely stony loam, 0 to 20 percent slopes	NPSL	11	0.1
Stockbridge and Nellis extremely stony loams, 15 to 60 percent slopes	NPSL	11	3.7
Vergennes clay, 2 to 6 percent slopes	Statewide	6	5.3
Vergennes clay, 6 to 12 percent slopes	Statewide	7	2.4
Total	----	----	85.8

***Soils based on Natural Resources Conservation Service's dataset from the Vermont Center for Geographic information, 2015.**

Geprags Park is managed by the Town of Hinesburg with the goal of creating and maintaining early successional scrub/shrubland for recreation and wildlife[2]. The southern Lake Champlain Valley (BCR13) is a focal area for conservation efforts with respect to golden-winged warbler and other bird species, such as, prairie warbler (*Setophaga discolor*) and loggerhead shrike (*Lanius ludovicianus*) that occur in early successional habitats. Many wildlife species depend upon early successional habitat that is scarce due to the loss of sparsely vegetated areas through ecological succession. Geprags Park habitat currently supports knows population of golden-winged warblers, as five observations were recorded at Geprags Park in 2015 (Vermont Audubon[3]). As a species whose habitat requirements mirror that of many others, habitat management for the warbler will benefit other wildlife species.

The Vermont Department of Fish and Wildlife ("FWD") designated the golden-winged warbler as a wildlife species of regional conservation concern in the Northeastern Unites States[4] and a Species of Greatest Conservation Need ("SGCN") in the State of Vermont. The FWD therefore assigned this species a S3B rank, a status given to species whose breeding populations are at moderate risk. Golden-winged warbler is also identified as a priority species by the Vermont State Wildlife Action Plan ("VTWAP"), Vermont Audubon and the North American Bird Conservation Initiative ("NABCI"). Habitat requirements of this species also encompass resources used by a suite of additional SGCN and Priority Bird Species found within Bird Conservation Region 13 ("BCR 13"), the Lower Great Lakes/St. Lawrence Plain. Although not confirmed at Geprags Park other bird species that would also prefer golden-winged warbler's habitat requirements include: American woodcock (*Scolopax minor*)[5,6], brown thrasher (*Toxostoma rufum*) [3,4], eastern towhee (*Pipilo erythrophthalmus*)[3], willow flycatcher (*Empidonax traillii*)[4], blue-winged warbler (*Vermivora cyanoptera*)[3,4], field sparrow (*Spizella pusilla*)[3,4], and Baltimore oriole (*Icterus galbula*)[4]. Suitable golden-winged warbler habitat also provides critical resources to migrant birds, resident mammals (i.e. white-tailed deer [*Odocoileus virginianus*], rodents and bats), and predatory animals (i.e. raptors and coyotes [*Canis latrans*]) that prey upon these species.

The ANGP Phase 1 permanent ROW[7] will be a 50-foot corridor and occupy approximately 2.48 acres of the western section of Geprags Park. Habitats within the ROW are currently composed of early successional scrub/shrublands containing dogwoods, viburnums and honeysuckle (38.0 percent of the ROW), and early successional forest composed of saplings and small trees (10.3 percent), grassy areas (51.7 percent). Small to medium sized openings and a trail system exist within the shrubland structure. Soils within the Project corridor are provided in Table 2.

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[2] Geprags Park Trails. Updated on May 28, 2014. Available on-line at http://www.mobilemaplets.com/showplace/11361
[3] Labar, M. of Vermont Audubon. Habitat Assessment for the Vermont Gas Pipeline through Geprags Park Hinesburg, Vermont. May 3, 2016
[4] Vermont's Species of Greatest Conservation Need. Chapter 4: Conserving Vermont's Wildlife Resources. Vermont's CWCS. 2005. Available on-line at www.vtfishandwildlife.com.
[5] Vermont's Species of Greatest Conservation Need from the Vermont Wildlife Action Plan.
[6] Bird Conservation Region 13 (Lower Great Lakes/St. Lawrence Plain) Priority Bird Species from the North American Bird Conservation Initiative.
[7] During construction portions of the ANGP Phase 1 will have an additional 25 foot temporary ROW located on the eastern side of the ROW

Table 2: Summary of soil types within 50-foot permanent VGS ROW within Geprags Park			
Soil Name*	**Vermont Farmland Classification**	**Vermont Farmland Agricultural Value**	**Area (acres)**
Covington silty clay	Statewide (b)	6d	0.7
Enosburg and Whately soils, 3 to 8 percent slopes	Statewide (b)	4d	1.8
Limerick silt loam	Statewide (b)	4d	0.1
Livingston clay	NPSL	10	0.2
Total	-	-	2.9

***Soils based on Natural Resources Conservation Service's dataset from the Vermont Center for Geographic information, 2015.**

Geprags Park VGS ROW Vegetation and Habitat Management Plan

Following the installation of the pipeline through Geprags Park the site will be restored to pre-construction elevations, stabilized, seeded and mulched per the Erosion Prevention and Sediment Control ("EPSC") Plan as approved through the Individual Construction Stormwater Permit (No. INDC-6949.2). Seed mixes are specified in the EPSC Plan and are specific to wetland and upland areas as needed. Following site stabilization VGS would install additional plantings, as described in the GPVR VHMP details below, within the corridor and additional workspace to accelerate the natural revegetation process.

Previously, VHB prepared a VMP for ANGP to describe the protocols for operational phase vegetation maintenance, non-native invasive plant species ("NNIS") monitoring, and rare plant impact monitoring to be performed along the Project alignment. The VMP's objectives are to protect existing natural resources found within the ROW while allowing VGS to adhere to required pipeline corridor maintenance safety standards. Per the VMP, VGS will conduct special vegetation management practices and conduct monitoring for the presence/absence and potential control of NNIS within the ROW. VGS will also monitor for the spread or colonization of NNIS.

The primary goal of the GPVR VHMP is to enhance, create and maintain a unique array of early successional habitat for the golden-winged warbler, which would inherently benefit a suite of other wildlife species that utilize these areas. Early successional habitat includes a medley of grasses, forbs, shrubs and small trees. It provides an abundance of resources for a variety of wildlife species, although regular disturbance, such as tree removal, mowing, and/or schematic plantings (i.e. a planned layout of specific species at predetermined locations), is required in order to maintain an early successional state. The type, frequency, and intensity or size of the disturbance regimes are determined based on factors such as the desired habitat and project size.

Managing the corridor to benefit the golden-winged warbler will provide suitable habitat for a variety of bird and other species. Shrubland habitats are important for bees and butterflies, black bear (*Ursus americanus*), white-tailed

deer (*Odocoileus virginianus*), garter snake (*Thamnophis* species) and frogs. Wetlands in the park and in the vicinity of the VGS corridor also provide breeding habitat for insects, which in turn provide a food resource for bat species, including hoary bat (*Lasiurus cinereus),* silver-haired bat (*Lasionycteris noctivagans*) and northern long-eared bat (*Myotis Septrionalis*). Bats may also forage for insects in or commute through open, early successional areas that act as a flyway between roosts and foraging locations. Rodents, such as voles (*Microtus* species), a variety of mice, moles, shrew and lemming, utilizing the corridor would also be potential prey items for predators like the gray fox (*Urocyon cinereoargenteus*) and weasels (*Mustella* species). Raptors, such as the American kestrel (*Falco sparverius*) and red-tailed hawk (*Buteo jamaicensis*) might also hunt for small mammals and amphibians within corridor.

Pre-construction monitoring of the GPVR VHMP identified two NNIS, Morrow's honeysuckle (*Lonicera morrowii*) and reed canary-grass (*Phalaris arundicacea*). The GPVR VHMP may include pre-treatment of the ROW if it is necessary for the establishment of desired plants. Post-construction NNIS monitoring and treatment may also be required in order to prevent encroachment of invasive species and formations of dense, monotypic stands that are not suitable for use by golden-winged warbler[8]. Any individual or small grouping of NNIS identified during annual monitoring will be removed by manual extraction with off-site disposal if there is risk to economic or resource value. Risk assessment may include a professional evaluation of the occurrence propensity to dominate (e.g. develop a colony size > or equal to 20 percent of the given habitat type). Control of larger populations/occurrences that pose a risk to economic or resource value will also be conducted by manual extraction as feasible and identified by annual monitoring reporting. VGS will only use herbicides for vegetation control under the direction of the Vermont Agency of Natural Resources ("ANR"), and in consultation with the Hinesburg Conservation Commission. Specific control activities undertaken in any given year will be included in the annual monitoring report. If particular area has been overspread by population(s) of NNIS that are beyond the extent or control of Project activities, this information will be reported to the ANR in the annual report and no control activities will be undertaken[9].

VGS will provide $2,000 to $3,000 per year to the Town of Hinesburg for ten years to implement and adaptively manage the GPVR VHMP, in accordance to budget agreements that may be reached between VGS and the Hinesburg Conservation Commission. The proposed GPVR VHMP is subject to revision in future years based on feedback from the Hinesburg Conservation Commission and VGS. The GPVR VHMP is intended to exceed basic corridor restoration and vegetation management requirements specified in the Project's Certificate of Public Good and associated exhibits. Per the Deed of Easement, VGS will comply with the written plan for the protection and enhancement of golden-winged warbler habitat in the pipeline vicinity and, in the future, collaborate with Audubon Vermont and the Hinesburg Conservation Commission. Accordingly, the following actions are compliant with recommendations outlined in the "Best Management Practices for Golden-winged Warbler Habitat on Utility Rights-of-way in the Great Lakes", "Best Management Practices for the Golden-winged Warbler Habitat in Forest and Shrub Wetlands of the

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[8] Golden-winged Warbler Working Group. Best Management Practices for the Golden-winged Warbler Habitat in Forest and Shrub Wetlands of the Appalachians. Unknown date.
[9] Vanasse Hangen Brustlin, Inc. May 3, 2013. Vermont Gas Systems, Inc. Addison Natural Gas Project – Phase I (Colchester to Middlebury).

Appalachians", and are specific to the Deed of Easement between VGS and the Town of Hinesburg and The Habitat Assessment for the Vermont Gas Pipeline through Geprags Park (Audubon Vermont 2016):

- Vegetation management and any additional work, including initial construction, maintenance, repair and replacement, and mowing, will not occur between April 15 and July 31, 2016, unless breeding bird surveys indicate no evidence of nesting activity, to avoid disturbance to nesting birds. This time frame will also give the area time to recover prior to the 2017 breeding season.

- Work will only occur within the ROW and designated temporary construction sites to minimize disturbance to wildlife.

- ROW maintenance will occur per the VMP on a 2 to 3 year cycle to allow for the establishment of desirable grasses and forbs, primarily goldenrod.

    - Per the VMP a 20-foot corridor centered on the pipe will be kept mowed to keep woody vegetation from becoming established.
    - The remaining 15-foot zone on either side of the 20-foot mowed corridor, out to the edge of the ANGP Phase 1 ROW will be managed for golden-winged warbler habitat as described herein.
    - Per the VMP, Vegetation Management Type A (RTE Plant Species) and B1 (Perennial Stream Riparian Corridors) will be applied in the southern portion of Geprags Park (see Sheet 31 of VMP Attachment 1)

- A planting schematic has been developed to facilitate the appropriate placement of native woody shrubs and grasses to maximize species structure and diversity along the ROW boundaries. Plantings will be arrayed in clumps and may include areas along the ROW and south of the treed hedgerow in the old field habitat (a list of potential vegetative species is provided in Table 3).
    - Woody shrubs will be planted at the boundaries of the Easement Area to enhance the habitat specific to the Warblers, as well as additional shrubs inside the Easement Area as depicted on the "Riparian Zone Vegetation Management Plan".

- Vegetative management will occur within the permanent ROW.

- Audubon Vermont will continue to monitor the golden-winged warbler following construction and may provide input to VGS on whether adaptive vegetation management is necessary.

The configuration of planned habitat components within the ROW will be strategically arranged in a way that is consistent with best management practices for golden-winged warblers (see Attachment 3). The fundamental components of golden-winged warbler habitat include a unique array of plant species and structural heterogeneity. A variety of shrub species and woody vegetation will be planted unevenly along the forest on the western side of the

proposed VGS permanent ROW; goldenrod, native grasses or per EPSC Plan Seed Mix will be scattered in clumps throughout the corridor. This layout creates a "feathered edge" that includes fundamental structural and vegetative diversity. Approximately 30 to 70 percent of the corridor will be composed of unevenly distributed shrubs and saplings (3 to 13 feet) and low-woody vegetation (less than 3 feet) will occupy less than 25 percent of open space[10]. The east side of the proposed permanent VGS ROW currently lacks mature forest. Therefore, an estimated two to four canopy trees would be planted along the eastern portion of the corridor, as the guidelines recommend approximately 30 percent canopy cover. Canopy trees on the eastern portion of the ROW will be interspersed with shrubs and clumps of desired grasses. A summary of selected native species that can be planted are listed in Table 3. The desired species for plantings will be reviewed with ANR and Audubon Vermont.

Table 3. Native plants that can be used for early successional habitat enhancement.

Trees	
willow	*Salix* spp
prickly-ash	*Zanthoxylem* spp
hazel (tree variety)	*Corylus* spp.
alders (tree variety)	*Alnus* spp.
Shrubs/Woody Vegetation	
hawthorn	*Crataegus* spp.
dogwood	*Cornus* spp.
viburnums	*Viburnum* spp.
alders (shrub variety)	*Alnus* spp.
brambles	*Rubus* spp
elderberry	*Sambucus* spp.
hazel (shrub variety)	*Corylus* spp.
Grasses	
Per EPSC Plan Seed Mix	

Planting efforts will be made so that the distances between microedges, or changes in vegetation, will be less than 20 feet from any point within the corridor[8]. For example, one type of planting (grass clump, shrub or tree) will be within 20 feet of a different type of planting. Plantings will occur after installation of the pipeline, preferably during the 2016 growing season to allow the permanent ROW time to reestablish vegetation prior to the 2017 breeding season.

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[10] Golden-winged Warbler Association. Best Management Practices for the Golden-winged Warbler Habitats in the Appalachian Region. A Guide for Land Managers and Land Owners. Available on-line at http://webcache.googleusercontent.com/search?q=cache:5iEV1U3TMvYJ:www.gwwa.org/resources/GWWA-APPLRegionalGuide_130808_lo-res1.pdf+&cd=2&hl=en&ct=clnk&gl=us.

Conclusion

The GPVR VHMP will serve to protect and enhance early successional habitat within the ANGP Phase 1 corridor in Geprags Park. The pipeline ROW will be specifically managed to create early successional transitional edge habitat that is preferential to the golden-winged warbler and many other wildlife species. Project construction will take place outside of the golden-winged warbler breeding season. Following construction and stabilization, selected native trees and shrubs will be planted within the VGS ROW to minimize the time period required to restore the habitat, thereby minimizing the time period of potential impact to breeding habitat for the golden-winged warbler and other species from the construction and operation of ANGP Phase 1, and also enhancing and protecting habitat in the long term in Geprags Park. Cooperation between VGS and the Hinesburg Conservation Commission will guide implementation and any necessary future revisions of the GPVR VHMP.

ATTACHMENT 1

Audubon VERMONT

Habitat Assessment for the Vermont Gas Pipeline through Geprags Park Hinesburg, Vermont.

Golden-winged Warbler

Prepared by
Mark LaBarr
Audubon VT
March 2016

Audubon VERMONT

Introduction

The following pages provide a habitat assessment and management strategies for portions of Geprags Park that are associated with the Vermont Gas (VTG) pipeline and its associated right of way (ROW) in Hinesburg, Vermont. This assessment is part of the Golden-winged Warbler Protection Plan in the Stipulated Agreement between Town of Hinesburg and VTG. The assessment is also part of Audubon Vermont's Champlain Valley Bird Initiative (CVBI) which works with landowners to promote effective avian habitat management in the Champlain Valley. These recommendations are based on habitat requirements of priority bird species, primarily Golden-winged Warbler (*Vermivora chrysoptera*) and Blue-winged Warbler (*Vermivora cyanoptera*), that have been identified by the Vermont State Wildlife Action Plan (VTWAP) and the North American Bird Conservation Initiative (NABCI) as conservation priorities, and are the focus of regional conservation efforts (Appendix 1). Although this report is concerned primarily with habitat management for birds, numerous non-avian species will also benefit from its recommendations.

Geprags Park is located in Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13) as delineated by NABCI. The Lower Great Lakes/St. Lawrence Plain encompasses a narrow, low-lying plain stretching from the Champlain Valley west to Northeastern Ohio and surrounds the St. Lawrence River, and lakes Erie, Ontario and Champlain (Figure 1).

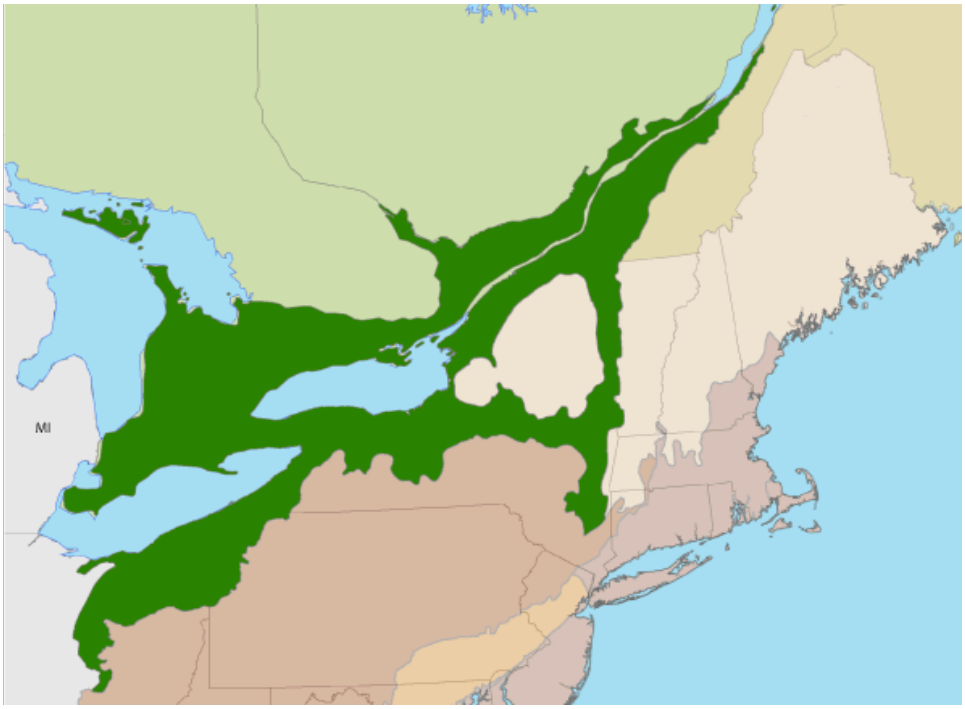

Figure 1. The Lower Great Lakes/St. Lawrence Plain (BCR 13) shown in green.

This BCR is comprised of extensive wetland ecosystems, accompanied by a mosaic of forests, agricultural fields and early-successional habitat (abandoned fields reverting to shrubland or young forests). The Champlain Valley of Vermont and New York has been identified as a Focus Area within BCR 13 because its mixed habitat types and open water are home to a number of BCR13's priority bird species.

Geprags Park is located in the northwest portion of the town of Hinesburg, Vermont. The larger landscape surrounding the property includes a mix of agricultural lands, small to medium-sized forest patches, and residential development. The property comprises approximately 86 acres of fields, early successional shrublands, and forest. The fields are not currently in agricultural use and contain a mix of grasses and forbs. The early successional shrublands, are comprised of a number of shrubland plant species including dogwoods and viburnums as well as invasive plant species. The property also supports a young forest of primarily northern hardwoods. Several small drainages run throughout the property, the largest of which is on the western portion of the property. There are roughly two miles of maintained trails in the park and Vermont Electric Power Company (VELCO) maintains a ROW under its powerlines that run through the park. Numerous invasive plant species including wild parsnip, European buckthorn, and honeysuckle are also present due to the past disturbance regime and the strong presence of these species in the Champlain Valley.

Current management activities include mowing most of the open fields, the trails and several larger openings annually. Beginning in 2012, Audubon Vermont worked with the Town of Hinesburg, the Hinesburg Conservation Commission and the U. S. Fish and Wildlife Partners Program to manage portions of the shrublands for priority bird species. This work was done over a period of about a year and a half and consisted of heavy brush hogging and removal of trees and invasive plant species with a chainsaw. The work resulted in the creation and maintenance of habitat that benefited Golden-winged Warblers and other shrubland species.

The habitat types at Geprags Park are common in the Champlain Valley and support bird species associated with early successional habitat types (shrublands and young forest), and mixed forests. Priority Bird Species (as identified by VTWAP, NABCI and Audubon Vermont) that are particularly well suited to these habitats include the focal species of this report, Golden-winged and Blue-winged warbler. The Golden-winged Warbler's high priority status is due to declines in its populations across its range, and the species is the focus of numerous conservation efforts directed in large part by the Golden-winged Warbler Working Group and the Golden-winged Warbler Conservation Plan. More information about the life history of this species, the working group and the conservation plan can be found at www.gwwa.org.

Vermont Gas Pipeline and Associated Right of Way (ROW)

The focus of this report is the western section of Geprags Park where the VTG pipeline will run and where the ROW will be maintained (Figure 2). This area comprises approximately 28 acres of the park. The siting of the pipeline was determined in part by the location of wetlands within and adjacent to the park. The pipeline and its associated 50 foot ROW as approved by the Vermont Public Service Board will run through an old field, a treed hedgerow and shrubland. In 2015, both a Golden-winged Warbler and a Blue-winged Warbler were trapped and banded in the shrubland section as well as other locations within the park (Figure 2). Golden- winged Warblers, Blue-winged Warblers and their hybrids have been observed since 2010 in the

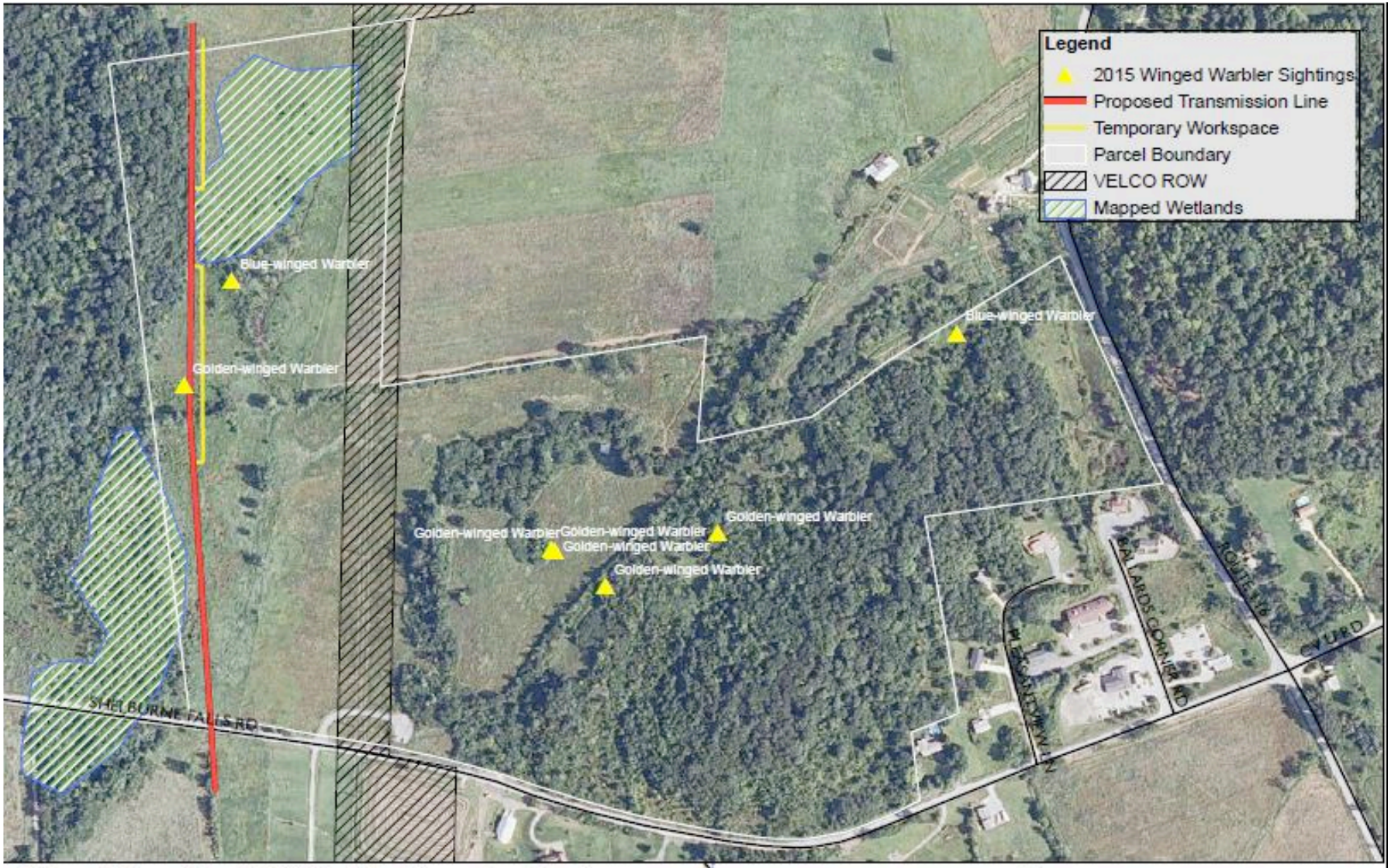

Figure 2. Locations in 2015 of Golden-winged and Blue-winged Warblers in relation to the proposed Vermont Gas Pipeline in Geprags Park, Hinesburg, VT.

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0 225 450 900 Feet

Audubon VERMONT

Map created by Margaret Fowle, March 2016
Data provided by Audubon VT, VCGI, ESRI, and VT Gas Systems

Not a survey. All boundaries and acreage figures approximate.

western section where the pipeline will be located. The habitat, a mix of shrubs, goldenrod filled openings, saplings and mature forest is ideal for these two species and a "Warbler Protection Plan" within the Stipulated Agreement has been created to protect these species during the breeding season. The plan includes efforts to enhance the habitat through plantings and monitoring the species post construction. Utility ROWs can be managed in a way that maintains habitat for Golden-winged Warblers, as addressed by the Golden-winged Winged Warbler Working Group's document "Best Management Practices for Golden-winged Warbler Habitat On Utility Rights-of-way in the Great Lakes" (http://www.gwwa.org/resources/GWWA-Habitat-GreatLakes-utility-130808_lo-res.pdf).

Management Options

Management options are provided for the portion of Geprags Park west of the main drainage and along the pipeline corridor. They are designed to provide guidance for activities that would benefit priority bird species and prevent and alleviate any disturbance resulting from the pipeline construction and ROW maintenance.

Assessment of Current Habitat Conditions along the Pipeline Corridor:

The shrubland habitat types where the pipeline will run are currently a mix of old field, early successional shrublands composed of dogwoods, viburnums and honeysuckle, and early successional forest composed of saplings and various species of small trees. Within this shrubland structure are a number of small to medium sized openings and a trail system. The shrubland habitat is situated between a mature hardwood forest to the west and hayfields to the east. As mentioned above, this mix of vegetation types and openings provides ideal habitat for a suite of bird species dependent on early successional habitat. Efforts to maintain this habitat structure by managing the amount of reforestation that occurs would benefit numerous priority species, including Golden-winged and Blue-winged warblers. Saplings, primarily ash, are currently beginning to dominate the area where the winged-warblers are found. Over time this succession of shrubland to forest will limit the use of this area by Golden-winged and Blue-winged warblers. As such, management actions will be required in the next couple of years to maintain the habitat. If done responsibly, the construction of the pipeline and the resulting ROW may enhance this habitat by removing saplings and creating a maintained 50-foot wide open area of grasses and forbs including goldenrod. If the pipeline and ROW do not go through Geprags Park, then other management actions some of which are described below will need to be undertaken in this area.

General Management Options for Shrublands:

- Brush hog portions of the shrublands every 3-5 years after August 1st to maintain shrubland habitat. Target native and non-native shrubs that are greater than 10 feet high for cutting (these will quickly regenerate) while maintaining 5-10 foot native shrubs, some trees, saplings, and snags throughout. The optimal shrub height is 5-10 feet tall for shrubland priority species. Brush hogging will enhance the habitat structure while preventing the encroachment of trees and will benefit several priority shrubland species
- Selectively remove tall trees after August 1st while retaining desirable shrub species. Trees can be cut or girdled outside of the nesting season, which is generally from April 15 – August 1. Girdled trees will become snags which can provide singing perches and nesting sites for cavity nesters.

- Aim to maintain at least 40% of the area in grasses and forbs to create a mixture of open field and shrubland. Leaving some areas undisturbed every year (ie brush hogging in thirds) will provide cover and food for species while the disturbed areas regenerate. Shrubland priority species benefit from a mixture of native shrubs, grasses, and forbs, all of which provide nesting habitat and food resources. Light pasturing after August 1st can also help achieve this habitat structure.
- If possible, target non-native shrubs such as buckthorn and honeysuckle for removal. Retain orchard fruit trees such as apples and pears where applicable. Native shrubs such as dogwoods and orchard fruit trees provide better quality resources than non-native species. For more information, see Invasive Plant Species section below.
- In areas where shrubs are limited, plant native shrubs to further the succession from field to shrubland. Plantings should be "clumped" to create the mosaic of shrubs and grasses and forbs.

Specific Management Actions Recommended for the Pipeline Corridor

Many of the recommended management actions follow those mentioned above with more specific guidance coming from the "Best Management Practices for Golden-winged Warbler Habitat On Utility Rights-of-way in the Great Lakes" (http://www.gwwa.org/resources/GWWA-Habitat-GreatLakes-utility-130808_lo-res.pdf). Below are actions specific to the agreement between VTG and the town of Hinesburg as explained in the Warbler Protection Plan.

- Work will be scheduled to avoid disruption of nesting. As such, no work will occur between April 15 and July 31, 2016 unless site surveys by Audubon Vermont in July indicate no evidence of nesting activity. Audubon Vermont recommends that actual construction occur after July 31 so as not to disturb the habitat prior to the arrival of the birds and give the area time to recover for the 2017 breeding season. In addition, future management of the ROW should take place outside these dates. ROW maintenance should occur on a 2-3 year cycle to allow the establishment of grasses and forbes, primarily goldenrod.
- Work within the area should stay within the pipeline ROW and designated temporary construction sites.
- Plantings of woody shrubs at the boundaries of the ROW should occur to enhance habitat for Golden-winged Warblers. As mentioned above, these plantings should be "clumped" and could include areas along the ROW south of the treed hedgerow in the old field habitat. This would bring this area into shrubland habitat at a faster rate and make it available for priority bird species sooner. A planting schematic should be put together post construction to assist with appropriate plant placement. VTG has committed $1000.00 to the purchase of native shrubs for this purpose.
- Monitor the ROW post construction to determine the impacts to the Golden-winged and Blue-winged warblers. As mentioned above the two birds captured in 2015 now have metal bands on their legs with unique number combinations. Return rates of these birds can be compared to other banded birds in the park. Surveys should be conducted over the next several years of both the birds and the vegetation (photo documentation) so management action can be altered if it is determined that other strategies would work better.

Summary

Geprags Park is home to many bird species including a number of priority birds such as the Golden-winged Warbler. This management plan looks to provide guidance during construction and post construction activities in an effort to protect nesting birds and maintain and potentially enhance habitat along the pipeline corridor. The park's juxtaposition next to other properties with similar early successional shrubland habitat types supports management actions that maintain the current habitat structure. Past management practices have maintained this shrubland habitat in other areas of the park. These management practices, however, will need to occur at regular intervals to insure the grasslands and shrublands are maintained long-term. Based on the results of past management efforts in the park we believe the pipeline and its associated ROW, if managed correctly, can provide opportunities for habitat maintenance and enhancement for priority bird species, including the Golden-winged Warbler.

Appendix 1.

Audubon VERMONT

Champlain Valley Priority Bird List

September 2014

Wetlands

Pied-billed Grebe [1,2]
American Bittern [1,2]
Least Bittern [1,2]
Wood Duck[2]
Common Goldeneye [2]
American Black Duck [1,2]
Sora [1]
Blue-winged Teal [1]
Bald Eagle [1]
Osprey[1]
Black Tern [1]

Shrub/Early Successional

American Woodcock [1,2]
Brown Thrasher [1,2]
Eastern Towhee [1]
Willow Flycatcher [2]
Golden-winged Warbler [1,2]
Blue-winged Warbler [1,2]
Field sparrow [1,2]
Baltimore Oriole [2]

Agricultural Grasslands

American Kestrel [1]
Northern Harrier [1,2]
Short-eared Owl [1,2]
Upland Sandpiper [1,2]
Sedge Wren [1]
Vesper Sparrow [1]
Grasshopper Sparrow [1,2]
Bobolink [1,2]
Eastern Meadowlark [1,2]

Deciduous/Mixed Forest

Scarlet Tanager [1]
Black-billed Cuckoo [1,2]
Whip-poor-will [1]
Veery [1]
Wood Thrush [1,2]
Canada Warbler [1,2]
Ruffed Grouse [1]
Chestnut-sided Warbler [1]
Black-throated Blue Warbler[1,2]
Cerulean Warbler [1,2]
Northern Flicker [2]
Rose-breasted Grosbeak [2]
Peregrine Falcon

Islands

Great Blue Heron [1]
Black-crowned Night Heron [1,2]
Common Tern [1,2]

[1] Vermont's Species of Greatest Conservation Need from the Vermont Wildlife Action Plan
[2] Bird Conservation Region 13 (Lower Great Lakes/St. Lawrence Plain) Priority Bird Species from the North American Bird Conservation Initiative

Audubon VERMONT

Champlain Valley Bird Initiative Resource List

NATIVE & INVASIVE PLANTS

Trees, Shrubs, & Vines for Attracting Birds by Richard M. DeGraaf, 2002. A wonderful guide to woody plants that are useful for attracting birds. Helpful tables for each plant species indicating birds that use the plant in terms of food, cover & nesting. $20

Landscape Plants for Vermont by Norman Pellett and Mark C. Starrett, 2002. An incredible reference book for plants that will grow in Vermont; highlights native species. Organized by plant type (i.e., vines, shrubs, trees) and mature height. Lists plants resistant to deer browse and poisonous plants. Order online through UVM Master Gardener Program. $15 *See website list.*

Native Shrubs and Vines for Northern New England Landscapes by Norman Pellett, 2001. Strictly native Vermont plants. Includes plant descriptions and uses in the landscape; appendices list plants suited for wet, dry and woodland sites. Published by Friends of the Horticulture Farm, P. O. Box 64788, Burlington, VT 05406. $7

Native Trees, Shrubs, and Vines: a Guide to Using, Growing, and Propagating North American Woody Plants by William Cullina, 2002. A tremendous reference book with wonderfully written, engaging prose. Species accounts include wildlife uses, cultural and propagation information, native habitats and more. Color photos. $40

Native Plants of the Northeast; A Guide for Gardening and Conservation by Donald J. Leopold, 2005. A book that is specific to our region with a great balance of perennials, annuals, shrubs, trees & vines. $40

Sources of Native Plant Materials in Vermont, Agency of Natural Resources, 2003. An updated publication, listing Vermont nurseries that carry native species and the plant species available at each nursery. Contact information included. A great resource.
http://www.anr.state.vt.us/dec/waterq/wetlands/docs/wl_nativeplants.pdf
Available in print or online. Free.

Vermont Invasive Exotic Plant Fact Sheet Series, revised 2003. A collection of black and white fact sheets for 25 invasive species. Identification, habitat and control information. Available online from Vermont Master Gardeners, *see website list*.

Native Alternatives for Invasive Ornamental Plant Species, edited by Timothy M. Abbey for the Connecticut Invasive Plant Working Group. Small booklet; recommends multiple native alternatives for five commonly planted invasive ornamentals – color photos. Available in print or online. http://www.caes.state.ct.us/SpecialFeatures/NativeAlternatives.pdf

FORESTRY & CONSERVATION

Working with Your Woodland: A Landowner's Guide, *revised edition* by Mollie Beattie, Charles Thompson, and Lynn Levine, 1993. Covers a wide spectrum of compatible woodland management

objectives – wildlife, recreation, timber and firewood - as well as the technological, environmental, tax and legal concerns. $25.

BIRDS

The Audubon Society Guide to Attracting Birds: Creating Natural Habitats for Properties Large & Small by Stephen W. Kress, 2006. The "everything-you-need-guide!" From specific native plant recommendations to create cover and nesting sites on your property, this book thoroughly covers all the aspects of attracting birds to your yard and beyond. Great designs for nesting platforms, advice for the larger landowner, and a wonderful resource appendix. $24.95

Birdwatching in Vermont by Ted Murin & Bryan Pfeiffer, 2002. Great for finding spots to visit for specific birds in order learn about their habitat requirements. $20

Sibley's Birding Basics by David Allen Sibley, 2002. Learn how to look at and listen to birds. $15.95

Bird Watcher's Digest *magazine,* edited by William Thompson, III. Bird identification tips, landscape and gardening articles, and in-depth exploration of different bird species. *http://birdwatchersdigest.com/* Six issues per year, $20 subscription.

Identify Yourself: The 50 Most Common Birding Identification Challenge by Bill Thompson III, 2005. This is an excellent book for sorting out and identifying those tricky birds that are difficult to distinguish from one another. Aimed at beginners and intermediates. $19.95

WILDLIFE HABITAT

A Landowner's Guide: Wildlife Habitat Management for Vermont Woodlands Ronald J. Regan and Ginger Anderson, publication coordinators. Each creature receives an entire chapter that focuses on its natural history, habitat requirements and management practices or projects. Booklet available through VT Fish & Wildlife Department, Waterbury, (802) 241-3700, free.

Landowner's Guide to Wildlife Habitat; Forest Management for the New England Region by Richard M. DeGraaf, Mariko Yamasaki, William B. Leak, and Anna M. Lester, 2005. An easy-to-use guide for enhancing wildlife habitat quality, timber values and the appearance of forest lands. Explains how to work with professional foresters to meet your goals. Great color photographs. $16.95

Enhancement of Wildlife Habitat on Private Land by Daniel Decker and John Kelley, 1998. A popular 42-page publication with illustrations and instructions for 10 projects designed to provide desirable habitat for wildlife. http://store.cce.cornell.edu/ Order online through Cornell Cooperative Extension Resource Center. Publication #16271

Landscaping for Wildlife by Carrol Henderson, 1987. A landowner's guide to developing backyard, farm, and woodlot habitats for wildlife.
http://www.comm.media.state.mn.us/bookstore/bookstore.asp Available online through Minnesota's Bookstore, Department of Natural Resources. $10.95

Backyard Wildlife Habitat in Vermont by Steve Parren, 1993. Provides information on creating habitat for birds and other wildlife, specific to Vermont. Booklet available through VT Fish and Wildlife Department, Waterbury, (802) 241-3700, $3

Noah's Garden: Restoring the Ecology of Our Own Back Yards by Sara Stein, 1995. This author completely breaks through the mysteries of gardening and shows us how we need to simply plant

with nature (i.e. plant native plants and plant them where they will thrive) instead of fighting against nature. $13.00

Planting Noah's Garden: Further Adventures in Backyard Ecology by Sara Stein, 1997. Furthers Stein's campaign to make lawns animated, full of disorder, life, and wildness. Packed with practical instructions for planning and maintaining a garden of one's own. Wonderful entertainment for anyone with a green thumb. $35

VERMONT NATURAL HISTORY

Wetland, Woodland, Wildland; A Guide to the Natural Communities of Vermont by Elizabeth H. Thompson & Eric R. Sorenson, 2000. A ground-breaking, comprehensive book on Vermont's natural communities, including descriptions of over 80 community types, their native species and places to visit. $20

The Nature of Vermont; Introduction and Guide to a New England Environment by Charles W. Johnson, 1980. An engaging narrative history. $17

Reading the Forested Landscape by Tom Wessels with Brian Cohen illustrator, 1997. Bill McKibben wrote, "Equal parts Sherlock Holmes and Aldo Leopold, it will help thousands of New Englanders answer the questions that come to mind when they walk this landscape of stone walls, stunted apple trees and towering hemlocks."$19

FIELD GUIDES

The Sibley Field Guide to Birds of Eastern North America by David Allen Sibley, 2003. A portable version of the Sibley guide, limited to Eastern birds; beautiful full-colored drawings and color-coded range maps. $20

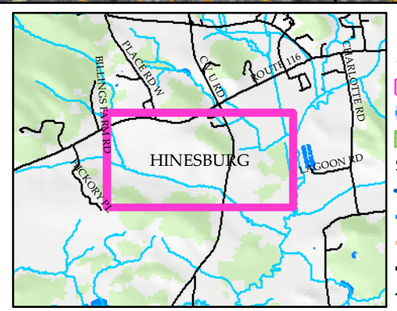
A Field Guide to the Birds of Eastern and Central North America*, 5th edition (Peterson Field Guides)* by Roger Tory Peterson, 2002. A birding classic. Page numbers in *Birding by Ear's* booklet refer to the species descriptions in this book. $20

Birding by Ear: Eastern/Central North America (Peterson Field Guides) by Richard Walton and Robert Lawson, 1990. Teaches a unique system for distinguishing and remembering bird songs, using mnemonics and descriptive words. The authors have created learning groups of similar bird songs and clearly point out distinguishing characteristics. 3 CDs and guide booklet, $30

The Shrub Identification Book by George W. Symonds, 1963. Organized like the Tree Identification Books; a great tool for learning shrubs. $15

ATTACHMENT 2

Sources: Background By VMP (2011); Study Areas by VHB (2012-2015); Delineated Wetlands and Streams, Vernal Pools, Ordinary High Water, & Bridge/Culverts by VHB (2011-2015); RTE Species, Veg. Nat. Communities, & Bat Trees surveyed by Gilman & Briggs (2012-2015); WDP Element Occurences by ANR (2013); VSWI Wetlands by ANR (2014); Deer Wintering Areas by VHB (2012/13); 10' Contours generated by VHB from HydroDEM by VCGI (2008); Statewide datasets from VCGI (2010) include: Roads by VTrans (2015), Town and County Boundaries by VCGI (2008), Streams and Waterbodies by VHD (2008), Railroads by VTrans (2003), Parcel Boundaries provided by CHA (2015); VELCO Structures from VELCO (2012); Proposed Transmission/Distribution/Network by CHA (2012-2015).



- 2015 Golden-winged Warbler Sightings (Audubon VT)
- Trails (hart)
- VHB Study Area
- Approved Route (CHA)
- Wetland (Proposed Class) (VHB)

Stream (Proposed Type)
- Stream Centerline (VHB)
- Stream Top of Bank or Slope (VHB)
- Ditch (VHB)
- 50 ft. Class II Wetland Buffer (VHB)
- Natural Resource Buffer (VHB)

- Vernal Pool (VHB)
- Potential Vernal Pool (VHB)
- RTE Plant Area (G&B)
- RTE Plant Location (G&B)
- Surveyed Potential Bat Tree (G&B)
- Potential Bat Tree (G&B)
- Deer Wintering Area (VHB)
- Veg. Natural Community (G&B)
- Natural Resource Feature Continues (VHB)
- RTE Species/Communities (VT FWD)
- VELCO Structure Location (VELCO)
- Transmission Lines (VELCO)
- Deer Wintering Area (ANR)
- VSWI Wetland (ANR)
- NRCS Soil Boundary (VCGI)
- Bridge (VHB)
- Culvert (VHB)
- Railroad (VTrans)
- Roads (VTrans)
- 10' Contour (VCGI)
- 50' Contour (VCGI)
- Stream (VHD)

400 200 0 400 Feet

Vermont Gas - ANGP Phase I
Hinesburg, Vermont
Geprags Park

May 17, 2016

vhb

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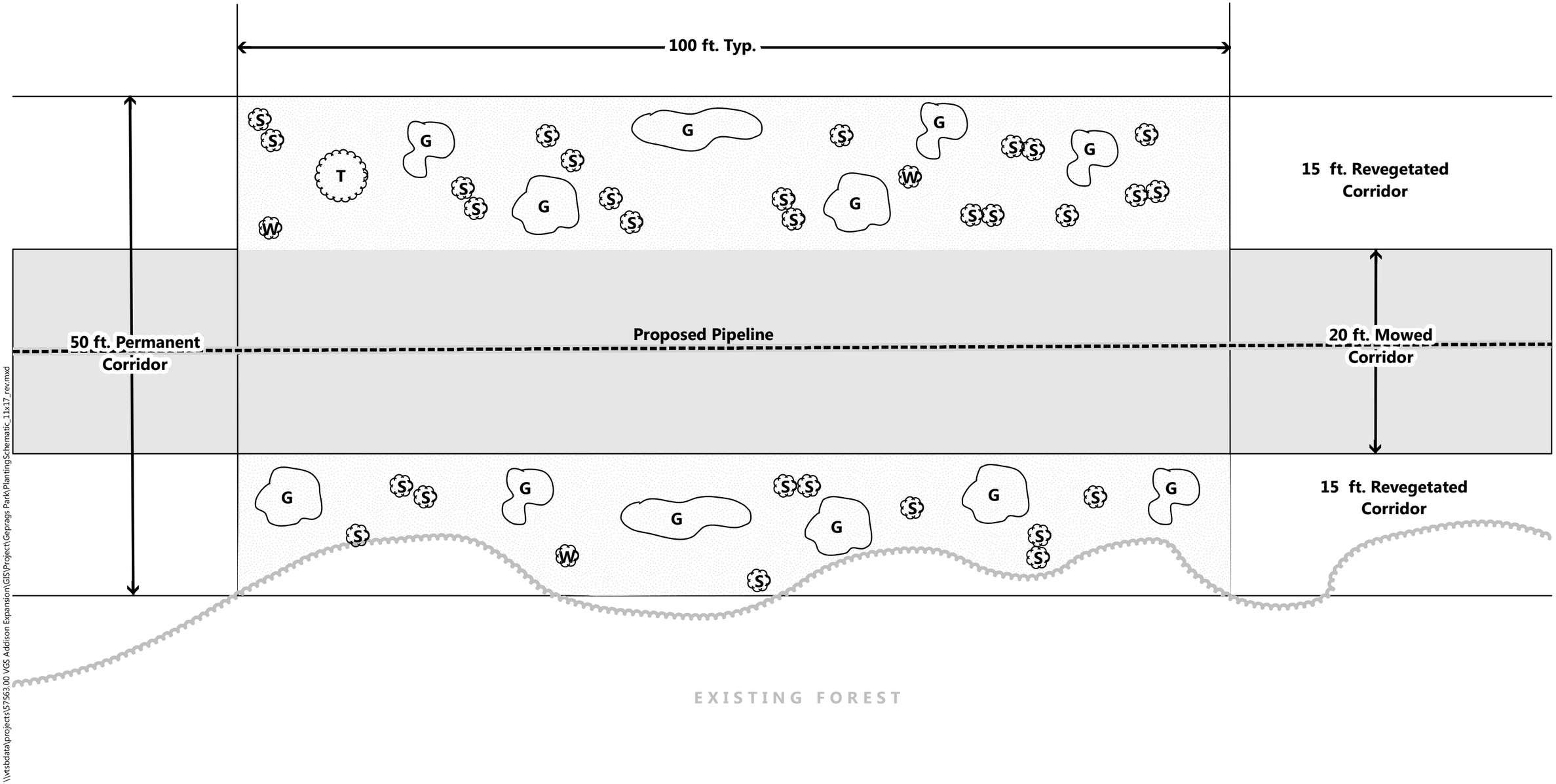
ATTACHMENT 3

May 17, 2016



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Not To Scale

T Proposed Tree

G Proposed Area of Grass Planting

W Proposed Woody Vegetation

S Proposed Shrub

Addison Natural Gas Project Phase 1 | Hinesburg, Vermont

Geprags Park
Vegetation Management Plan
Planting Schematic
Typical