January 29, 2015

Ref: 57276.03

Ms. Martha Abair
Senior Project Manager
USACE / Regulatory Branch / Vermont Project Office
11 Lincoln Street, Room 210
Essex Junction, VT 05452

Re: Jay Peak Resort - Jay, Vermont
Permit Number: NAE-2008-1314
Golf Course Wetland and Stream Mitigation
Fourth Annual (2014) Monitoring Report

Dear Marty:

On behalf of Jay Peak Resort ("JPR"), VHB has prepared the enclosed report and supporting documentation to summarize the results of the fourth year of monitoring of the wetland and stream features which were restored or created as part of mitigation for the golf course, which was constructed without U.S. Army Corps of Engineer ("USACE") authorization. This monitoring was completed in accordance with Special Condition #4 of the Section 404 Individual Permit ("IP") (Permit Number NAE-2008-1314), which was issued after-the-fact.

As described in the IP application narrative and subsequently approved, the monitoring methods used for this site were developed to determine if the mitigation goals were being met. The goals are described in Special Condition #2 of the IP, and include:

- The restoration of natural vegetation communities in the restored/created wetlands and streams;
- The replacement of the functions and values provided by the impacted wetlands and streams.

Please find enclosed one hardcopy of the complete *Jay Peak Resort, Golf Course Wetland and Stream Mitigation, Fourth Annual (2014) Mitigation Report* and Appendix with supporting documentation, as well as a complete electronic copy on compact disc.

On behalf of JPR, VHB would like to thank you for your continued collaboration with JPR and VHB regarding the ongoing golf course monitoring efforts, and for reviewing this monitoring report. Please do not hesitate to contact me if you have any questions or comments.

Engineers | Scientists | Planners | Designers

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Suite 200
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P 802.497.6100
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Sincerely,

Patti B. Kallfelz-Werts
Environmental Scientist

PBW/jkw

cc: Denise Leonard, U. S. Environmental Protection Agency (one hardcopy)
Policy Analyst/ Technical Support Branch ("PATS"), USACE (one hardcopy)
Walter Elander, JPR (electronic copy only)

Enclosure:

- *Jay Peak Resort – Golf Course Wetland and Stream Mitigation – Fourth Annual (2014) Mitigation Monitoring Report* (one hardcopy and one electronic copy)

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Fourth Annual (2014) Mitigation
Monitoring Report

JAY PEAK RESORT

GOLF COURSE WETLAND AND STREAM MITIGATION

Jay, Vermont

Prepared for: **Jay Peak Resort**
Jay, Vermont

Prepared by: [illegible]
40 IDX Drive
Building 100, Suite 200
South Burlington, VT 05403

January 29, 2015

vhb

Table of Contents

Table of Contents i

1.0 Introduction 1

2.0 Summary and Monitoring Methodologies 4

3.0 Vegetation Data Results 7

3.1 Herbaceous 7

3.2 Shrub Species 8

3.3 Natural Woody Recruitment 9

4.0 Hydrology 9

5.0 Functions and Values Assessment 11

5.1 Vernal Pool Biology Assessment 12

6.0 Stream Assessments 12

7.0 Invasive Plant Species 13

8.0 Remedial Actions 13

9.0 Conclusions/ Recommendations 14

10.0 References 15

Appendix:

- Jay Peak Resort Golf Course Site Location Map
- Jay Peak Wetland and Stream Mitigation, 2014 Monitoring Maps (Index and Maps 1 through 7)
- Herbaceous Species and Cover Summary Data from Permanent $1m^2$ Plots and Wetland Data Plots
- Woody Stem Survival Assessment Based on 0.02-acre (5-meter Radius) Permanent Vegetation Monitoring Plots and Wetland Data Plots
- Wetland Determination Data Sheets
- Jay Peak Resort Golf Course Mitigation Monitoring – Year 4 Photographs
- Mitigation Report Transmittal and Self-Certification

10.0 References

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1.0 Introduction

On behalf of Jay Peak Resort ("JPR"), VHB has prepared this report to present the findings of the fourth year of post-construction monitoring of the restoration work conducted by JPR to mitigate for impacts which resulted from the construction of an 18-hole golf course at the resort between 2004 and 2006 (see JPR Golf Course Site Location Map in the Appendix, page 1). This mitigation was necessary for JPR to qualify for an after-the-fact Individual Permit ("IP") under Section 404 of the Clean Water Act, for dredge and fill work conducted in jurisdictional waters of the U.S., including wetlands ("Waters"). The IP (Permit Number: NAE-2008-1314), was issued June 23, 2011, and required JPR to monitor the restoration and creation areas within the golf course for a period of five years, and included reference to the criteria and success standards which were used to conduct these monitoring activities and evaluate performance (USACE 2011). The purpose of the annual monitoring and reporting is to measure the progress of the mitigation areas relative to the success standards and to offer recommendations to ultimately achieve site success standards.

The mitigation activities, which were completed during the 2009 and 2010 construction seasons (VHBP 2010 and VHB 2010), included the restoration of 19 stream segments, and 0.58 acres of wetland, in addition to the creation of 1.86 acres of wetland (VHB 2010). Three years of annual monitoring conducted by VHB in July 2011 and 2012, as well as August 2013, indicate that all performance standards were being met in 2011 and most of the performance standards were being met in 2012 and 2013 (see Table 1 below). The results of the Year Four (2014) monitoring indicate that all but two of the performance standards are being met at this time. The performance standard that involves the survival rate of planted, native wetland shrubs was determined to be partially met during 2014. An additional performance standard which is not currently being met involves the presence of vernal pool indicator amphibian species within a select number of restored or created wetlands. The absence of the vernal pool species does not indicate an oversight on the part of JPR or failure to comply with the conditions of the IP since JPR has not undertaken any changes to these features that would affect their ability to support vernal pool, or any, biota. Field activities for the Year Four (2014) monitoring took place on August 4 and 5, 2014, and were conducted by VHB Environmental Scientists. A summary description of each standard and Year Four (2014) monitoring results are provided in Table 1, with greater detail provided in Section 2.0.

Table 1: Performance Standard Outline and Success Measure

Performance Standard	Success Criteria	Monitoring Method	Performance Standard Met (?) Year 1 (2011)	Performance Standard Met (?) Year 2 (2012)	Performance Standard Met (?) Year 3 (2013)	Performance Standard Met (?) Year 4 (2014)
1. Re-establish (or establish in created wetlands) a natural wetland vegetation community in restored wetland areas	Herbaceous vegetation coverage of a minimum 80% of native, wetland plants within the restored and created wetland areas	Monitor herbaceous vegetation from permanent 1 square meter herbaceous vegetation monitoring plots [established in Year One (2011)] within the restored and created wetlands and adjacent to large stream restorations	**Yes;** based on extrapolation of 1 square meter plots, average coverage within the wetland mitigation areas is 100%	**Yes;** based on extrapolation of 1 square meter plots, average coverage within the wetland mitigation areas is over 100%	**Yes;** based on extrapolation of 1 square meter plots, average coverage within the wetland mitigation areas is over 100%	**Yes;** based on extrapolation of 1 square meter plots, average coverage within the wetland mitigation areas is over 100%
	Survival rate of 80% of the planted native, wetland shrubs	Establish permanent 0.02-acre (5m radius) monitoring plots within the restored and created wetlands	**Yes;** based on extrapolation of 0.02-acre (5m radius) plots, shrub stem survival within the mitigation wetlands is 93%	**Yes;** based on extrapolation of 0.02-acre (5m radius) plots, shrub stem survival within the mitigation wetlands is 84%	**Yes;** based on extrapolation of 0.02-acre (5m radius) plots, shrub stem survival within the mitigation wetlands is 80%	**Partial;** based on extrapolation of 0.02-acre (5m radius) plots, shrub stem survival within the mitigation wetlands is 79%; average shrub survival for restored stream floodplains is 81%; total average shrub survival rate for all plantings is 80%
	Wetlands develop a natural community, which blends into the adjacent, undisturbed features	Establish at least one permanent photograph monitoring station within each restored or created wetland which shows the adjacent undisturbed feature	**Yes**; permanent photograph stations were established in each wetland feature which shows the restored or created feature, and the adjacent undisturbed features	**Yes;** photographs recorded from permanent photograph stations (established in 2011); photos illustrate the restored or created feature, & the adjacent undisturbed features	**Yes;** photographs recorded from permanent photograph stations (established in 2011); photos illustrate the restored/ created features & the adjacent undisturbed features	**Yes;** photographs recorded from permanent photograph stations (established in 2011); photos illustrate the restored/ created features & the adjacent undisturbed features

Table 1: Performance Standard Outline and Success Measure

Performance Standard	Success Criteria	Monitoring Method	Performance Standard Met (?) Year 1 (2011)	Performance Standard Met (?) Year 2 (2012)	Performance Standard Met (?) Year 3 (2013)	Performance Standard Met (?) Year 4 (2014)
2. Re-establish (or establish in the created wetlands) wetland hydrology	Clear evidence of hydrology based on the criteria in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (Regional Supplement) (USACE 2012)	Visual assessment of restored or created wetlands for evidence hydrology indicators	**Yes**; all but one feature (H15-WT1) of the restored/ created wetlands show evidence of persistent wetland hydrology	**Yes**; despite the below average precipitation during July & August 2012, all mitigation wetlands show evidence of persistent wetland hydrology	**Yes**; all restored and created wetlands show evidence of persistent wetland hydrology	**Yes**; all restored and created wetlands show evidence of persistent wetland hydrology
3. Re-establish (or establish in the created wetlands) the functions and values provided by the wetlands within and adjacent to the golf course.	Clear evidence of the functions and values are being performed by the restored and created wetlands (previously identified as Groundwater Recharge/ Discharge and Wildlife Habitat)	Assess each wetland using methods in the Highway Methodology (USACE 1999)	**Yes**; all but one (H15-WT1) of the restored wetlands are showing evidence of performing the function of groundwater recharge; some of the restored/ created wetlands are functioning as wildlife habitat	**Yes**; all of the restored wetlands are showing evidence of performing the function of groundwater recharge; some of the restored/ created wetlands are functioning as wildlife habitat	**Yes**; all of the restored wetlands are showing evidence of performing the function of groundwater recharge; some of the restored/ created wetlands are functioning as wildlife habitat	**Yes**; all of the restored wetlands are showing evidence of performing the function of groundwater recharge; some of the restored/ created wetlands are functioning as floodflow alteration and as wildlife habitat
	Evidence of breeding use by vernal pool indicator species	Investigate the selected restored wetlands (WH-WT1, H13-WT2, & H14-WT1) at the appropriate time of year for signs of breeding use by vernal pool indicator species	**Yes**; all of the selected wetlands showed evidence of breeding use by vernal pool indicator species	**No**; none of the previously identified wetlands contained evidence of breeding use by vernal pool indicator species (H13-WT2 did contain other breeding amphibians)	**No**; none of the wetlands identified in 2011 as potential vernal pools contained evidence of breeding use by vernal pool indicator species during a site visit conducted in June 2013 (H13-WT2 did contain other breeding amphibians)	**No**; based on the results of 2012 and 2013 vernal pool surveys for the wetlands identified in 2011, no vernal pool survey was conducted in 2014

Table 1: Performance Standard Outline and Success Measure

Performance Standard	Success Criteria	Monitoring Method	Performance Standard Met (?) Year 1 (2011)	Performance Standard Met (?) Year 2 (2012)	Performance Standard Met (?) Year 3 (2013)	Performance Standard Met (?) Year 4 (2014)
4. Visually assess each restored stream segment for evidence of natural channel development and stability	Restored stream segments show signs of naturalization, and minimal evidence of erosion	Visually assess each restored stream segment for signs of natural stream development; permanent photograph stations established to record progress throughout the monitoring period	**Yes**; the restored stream segments showed signs of ongoing substrate sorting, minimal erosion or undercutting of banks, and use of created floodplains (where applicable)	**Yes**; the restored streams continue to show evidence of naturalization. New areas of erosion in 2 restored streams (P2-TB1 & H16-SC1) have been repaired in 2012, or will be early in 2013.	**Yes**; the restored streams continue to show evidence of naturalization & have stabilized. Streams repaired in 2012 & 2013 remained stable in late 2013.	**Yes**; the restored streams continue to show evidence of naturalization & have stabilized. Streams repaired in 2012 & 2013 have remained stable through 2014. Bank sloughing repair was performed on a segment of Stream P2-TB1, during 2014, and bank stability will be monitored during 2015
	Vegetation communities in the adjacent re-created floodplain areas are developing with native, wetland vegetation	Same as with restored/ created wetlands (1 square meter and 0.02-acre (5m radius) plots)	**Yes;** average herbaceous vegetation cover is 95%; average planted shrub survival is 91%	**Yes; TOTAL** average herbaceous vegetation cover is over 100%; average planted shrub survival is 84%	**Yes; TOTAL** average herbaceous vegetation cover is over 100%; average planted shrub survival is 82% in the restored floodplains	**Yes; TOTAL** average herbaceous vegetation cover is over 100%; average planted shrub survival is 82% in the restored floodplains

2.0 Summary and Monitoring Methodologies

The mitigation features are, in general, performing consistent with expectations. The wetland vegetation communities continue to develop (including new species observed to be colonizing from adjacent previously undisturbed wetlands), all of the mitigation wetland features show evidence of wetland hydrology and all of the wetland features demonstrate the groundwater recharge/ discharge function; at the time of the Year Four monitoring data collection, the restored streams are stable and developing natural stream channel characteristics.

The following sections detail the mitigation goals and the methods used to assess adherence to the success criteria.

1. ***Re-establish a native wetland vegetation community within the restored wetlands and adjacent to restored stream segments; establish a native wetland vegetation community within created wetlands.***

In order to ensure a consistent data collection approach which could be compared throughout the 5-year monitoring period, VHB conducted the Year Four monitoring in approximately the same locations (using the same data plot designations) and using the same methodologies that were established in Year One. As stated above, the Year Four monitoring data collection was completed in early August, at the height of the growing season, which is consistent with procedures outlined in the Mitigation Plan, and with the first three years of monitoring. A full description of data collection methodologies is included in the *Jay Peak Resort – Golf Course Wetland and Stream Mitigation - First Annual (2011) Mitigation Monitoring Report* ("Year One Report") (VHB 2012). Data collection to determine overall herbaceous coverage was conducted using one-meter square plots or wetland determination data plots, established during the Year One monitoring (see Mitigation Monitoring Map Set on pages 2 through 9 of the Appendix for plot locations). Data collection for Year Four monitoring was repeated at approximately the same points as in Year One.

VHB also completed USACE Wetland Determination Data Forms for a selection of restored or created wetland features (see pages 13 through 28 of the Appendix). Those wetlands which were determined to need full wetland data collection to monitor the development of the three wetland criteria, prior to the Year One monitoring (2011), were again the subject of full wetland data collection during 2014. These features include: H11-Create, H11-WT6, H13-WT1/1a/1b, H15-WT1, H16-Create, H5-Create, H6-WT1, and H8-Create.

The one square meter herbaceous vegetation monitoring plots also served as the centers for the 0.02 acre (five-meter radius) shrub survival monitoring plots. The number of surviving planted shrub stems were counted within the 0.02-acre plots; this number was then extrapolated from the 0.02-acre monitoring plot (or plots) to the size of the restored or created feature and compared to the total number of stems planted within each feature (NEE 2010), to determine the overall

survival rate of survival of the planted shrubs. All planted shrubs within a feature were counted if that feature was similar in size or smaller than the 0.02-acre monitoring plots used. Natural recruits are included in the shrub tally as they become established.

Photographs were also recorded from the permanent photograph locations, established in 2011, in order to continue to provide visual documentation of the restored and created wetlands, as well as the restored stream channels (see Jay Peak Resort Golf Course Year 4 (2014) Monitoring Photographs on pages 29 through 50 of the Appendix) to ensure the restored and created features are developing naturally and blending with the adjacent, undisturbed features.

2. ***Re-establish (or establish in created wetlands) wetland hydrology (and hydrologic connections) through earthwork within restored and created wetlands to connect to existing Waters.***

The purpose of establishing wetland hydrology and hydrologic connections was not only to ensure the development of functioning wetlands, but to ensure that the restored and created features meet USACE jurisdictional parameters. Evidence of hydrology was assessed within each restored/created wetland during the visual assessment conducted within each feature, and the wetland determination data collection was conducted in a selection of features, based on guidance found from Regional Supplement indicators, and is summarized in Table 2, in Section 4.0 below.

3. ***Re-establish (or establish in created wetlands) the wetland functions and values within restored and created wetlands previously provided by the wetlands within and adjacent to the golf course.***

Using the methods described in the USACE's Highway Methodology, VHB assessed each restored and created wetland during the monitoring activities. VHB previously identified the functions and values of Groundwater Recharge/ Discharge and Wildlife Habitat as the target functions to be restored. The results of this assessment are provided in Table 2 in Section 4.0.

Because no evidence of use by vernal pool indicator species was found during the Year Two monitoring in wetlands WH-WT1, H13-WT2, and H14-WT1, no formal vernal pool survey was

conducted at during 2013, however, during the June 2013 site visit, the three target wetlands were observed for the presence of vernal pool species, but none were found. VHB did not conduct a formal vernal pool assessment for any of the restored or created wetlands during the Year Four monitoring.

4. ***Visually assess each restored stream segment for evidence of natural channel development and stability.***

During the monitoring activities, VHB walked the length of each stream channel to observe the development of the stream channel naturalization, and to look for potential problems to be addressed, such as bank erosion, grade control structure instability, disturbance by golfers, course maintenance operations, etc. Signs of channel naturalization included stream bed material sorting, natural sediment deposition, floodplain use, and the development of in-stream habitats (i.e., riffles, and step/pools). Streams that were repaired in 2012 and 2013, as discussed in the *Jay Peak Resort – Golf Course Wetland and Stream Mitigation - Third Annual (2013) Mitigation Monitoring Report* ("Year Three Report") (VHB 2014) were observed to be stable during the fourth year of monitoring. During 2014, minor bank sloughing was repaired on a stream segment of Stream P2-TB1, located between Jay Peak Road and Condo Road. Monitoring during 2015 will include bank stability observations at this stream segment, as well as other previously repaired stream segments.

3.0 Vegetation Data Results

3.1 Herbaceous

Monitoring efforts during 2014 found that the total average relative herbaceous cover within the wetlands and within the floodplains of the restored streams is over 100 percent, and is approximately 119 percent overall (see Herbaceous Species and Cover Summary Data from $1m^2$ Plots and Wetland Data Plots table on pages 10 and 11 of the Appendix), exceeding the performance standards of 80 percent coverage by non-invasive wetland herbaceous species. It is noteworthy that additional, native wetland species were recorded during the monitoring, which were not part of the wetland seed mix applied to the mitigation areas; this suggests the

surrounding, undisturbed features are contributing seed, and therefore increased species richness and diversity to the vegetation communities.

3.2 Shrub Species

Four shrub species were planted within the restored and created wetlands and adjacent to the large stream restoration segments after the completion of restoration activities in 2010; the species include:

- Winterberry Holly (*Ilex verticillata*),
- Elderberry (*Sambucus canadensis*),
- American cranberrybush (*Viburnum trilobum*)[1], and
- Red-osier dogwood (*Cornus sericea*).

Willow (*Salix* spp.) and dogwood (*Cornus* sp.) tubelings were planted at the same time as the shrubs, adjacent to all restored stream segments in order to increase bank stability. Since these tubelings were planted for the purposes of enhancing stream bank stability and not as vegetation community enhancement, they were not included in the shrub survival assessments.

Based on the data obtained from the permanent vegetation monitoring plots during 2014, the average shrub survival rate within the restored and created wetlands is 79 percent, and the average shrub survival rate for the larger stream segment restorations is approximately 82 percent, resulting in an overall average survival rate of all planted shrubs of 80 percent. The performance standards of 80 percent survival rate of planted shrubs has been met in 2014 (see Woody Stem Survival Assessment Based on 0.02-acre Permanent Vegetation Monitoring Plots and Wetland Data Plots summary table on page 12 of the Appendix). Although this performance standard was just met in 2014, it is noteworthy that none of the restored or created feature were proposed to have a shrub cover type. The planted shrubs were included to prove a minimum of structural diversity, and to provide a natural barrier to incursions by golfers.

[1] The accepted scientific name for American cranberry bush was *Viburnum trilobum* at the time of the restoration activities; the currently accepted name for this species is *V. opulus var. americanum* (USDA 2014).

3.3 Natural Woody Recruitment

Based on observations made in the field, natural woody recruitment within the restored and created wetlands and adjacent to restored stream segments has increased compared to conditions in 2012. It is anticipated that additional species will continue to "volunteer" from the surrounding, undisturbed woodlands. During 2014, VHB noted such volunteer species as yellow birch (*Betula alleghaniensis*), pin cherry (*Prunus pensylvanica*), choke cherry (*Prunus virginiana),* red maple (*Acer rubrum*), balsam fir (*Abies balsamea*), steeplebush (*Spiraea tomentosa*), and Bebb willow (*Salix bebbiana*), within a number of the restored and created wetlands, including Wetlands H4-WT3, H11-Create, H11-WT6, H11-WT2/3, H13-WT3, H15-WT1, as well as stream segment H12-TB1u. It is expected that these and other volunteer species will continue to naturally propagate and may be represented within the permanent vegetations monitoring plots during future monitoring efforts.

4.0 Hydrology

Based on the results summarized in Table 2 below, all of the restored and created wetlands show evidence of at least one primary, principal hydrology indicator, which would indicate hydrology is present within all of these features, and therefore that this success criterion is being met. The results of the assessment of hydrology within each restored or created wetland are detailed in Table 2.

Table 2: Summary of Hydrology Indicators and Functions and Values in the Restored and Created Wetlands

Feature	Hole #	VHB Map #	Evidence of Hydrology[2]	Principal Functions and Values[3]
H5-Create	5	1	B9 (Water-stained leaves); C3 (Oxidized Rhizospheres on Living Roots); B10 (Drainage Patterns)	Groundwater recharge/ discharge and Floodflow alteration (evidence of water retention and adjacent to perennial stream); Wildlife habitat (pickerel frogs (*Rana palustris*)) and various songbirds observed

[2] Alpha-numeric codes representing Evidence of Hydrology are from Regional Supplement (Section 4). "A" indicators represent direct observations of surface or groundwater; "B" indicators represent evidence an area is subject to regular ponding or flooding; "C" indicators include other evidence and area is normally saturated; and "D" indicators include other landscape/soil/vegetation features that indicate contemporary (not historic) wet conditions.
[3] Principal Functions and Values are from the USACE Highway Methodology (1999).

Table 2: Summary of Hydrology Indicators and Functions and Values in the Restored and Created Wetlands				
Feature	**Hole #**	**VHB Map #**	**Evidence of Hydrology[2]**	**Principal Functions and Values[3]**
H6-WT1	6	1	A2 (High Water Table); A3 (Saturation)	Groundwater recharge/ discharge (evidence of water retention)
WH-WT1	6	1	A1 (Surface water); A2 (High water table); A3 (Saturation); B13 (Aquatic fauna)	Groundwater recharge/ discharge (standing water at time of monitoring); Wildlife habitat (pickerel frogs)
WH-WT2	6	1	A2 (High water table); A3 (Saturation);B1 (Water marks); B4 (Algal mat or crust); B10 (Drainage patterns)	Groundwater recharge/ discharge (evidence of water retention and ground water discharge)
H4-WT1/2	4	2	A1 (Surface water); A2 (High water table); A3 (Saturation); B10 (Drainage patterns)	Groundwater recharge/ discharge and Floodflow alteration (groundwater discharge present; adjacent to small perennial stream with very dense vegetation)
H4-WT3	4	2	A2 (High Water Table); A3 (Saturation); B9 (Water-stained leaves); B10 (Drainage patterns)	Groundwater recharge/ discharge (groundwater discharge present, evidence of standing water)
H8-Create	8	3	A2 (High Water Table); A3 (Saturation); B9 (Water-Stained Leaves); B10 (Drainage Patterns)	Groundwater recharge/ discharge and Floodflow alteration (adjacent to intermittent stream with dense vegetation)
H1-WT1	1	4	A3 (Saturation); B9 (Water-stained leaves); B10 (Drainage patterns)	Groundwater recharge/ discharge and Floodflow alteration (adjacent to two perennial streams with little capacity up-gradient)
H11-WT2/3	11	6	A2 (High Water Table); A3 (Saturation); B10 (Drainage patterns)	Groundwater recharge/ discharge and Floodflow Alteration (adjacent to small perennial stream)
H11-Create	11	6	A2 (High Water Table); A3 (Saturation); B9 (Water-Stained Leaves)	Groundwater recharge/ discharge (evidence of water retention)
H11-WT6	11	6	A2 (High Water Table); A3 (Saturation); B9 (Water-Stained Leaves)	Groundwater recharge/ discharge (evidence of water retention and ground water discharge)
H16-WT1/ H11-WT1	16	6	A2 (High Water Table); A3 (Saturation);); B9 (Water-stained leaves); B10 (Drainage patterns)	Groundwater recharge/ discharge and Floodflow alteration (evidence of water retention; adjacent to small perennial stream with limited capacity up-gradient)
H16-Create	16	6	A2 (High Water Table); A3 (Saturation); B9 (Water Stained Leaves); B10 (Drainage Patterns)	Groundwater recharge/ discharge and Floodflow alteration (evidence of water retention and groundwater discharge; large wetland adjacent to perennial stream)
H13-WT1/1a/1b	13	7	A2 (High Water Table); A3 (Saturation); B9 (Water-Stained Leaves); B10 (Drainage Patterns)	Groundwater recharge/ discharge and Floodflow alteration (groundwater discharge points found; adjacent to small perennial stream with little capacity up-gradient)

Table 2: Summary of Hydrology Indicators and Functions and Values in the Restored and Created Wetlands				
Feature	**Hole #**	**VHB Map #**	**Evidence of Hydrology[2]**	**Principal Functions and Values[3]**
H13-WT2	13	7	A1 (Surface water); A2 (High water table); A3 (Saturation); B1 (Water marks); B9 (Water-stained leaves); B13 (Aquatic fauna)	Groundwater recharge/ discharge, Floodflow Alteration (outlets to small perennial stream) and Wildlife habitat (groundwater discharge points observed; pickerel frog and green frog (*Lithobates clamitans*) tadpoles observed
H13-WT3	13	7	A2 (High water table); A3 (Saturation); B9 (Water-stained leaves); B10 (Drainage patterns)	Groundwater recharge/ discharge
H14-WT2/3	14	7	A3 (Saturation); B4 (Algal mat or crust); B9 (Water-stained leaves); B10 (Drainage patterns)	Groundwater recharge/ discharge and Floodflow Alteration (evidence of water retention and adjacent to small perennial stream)
H14-WT1	14	7	A1 (Surface water); A2 (High water table); A3 (Saturation); B2 (Sediment deposits); B9 (Water-stained leaves); B10 (Drainage patterns)	Groundwater recharge/ discharge (groundwater discharge points observed)
H15-WT1	15	7	B9 (Water stained leaves); C3 (Oxidized Rhizospheres on Living Roots)	Groundwater recharge/ discharge

5.0 Functions and Values Assessment

VHB conducted an assessment of wetland functions and values during the Year Four monitoring efforts, using the methods outlined in the Highway Methodology, in order to ensure that the wetland functions and values impacted by golf course construction were restored. It was determined during the mitigation planning process that the principal functions and values provided by the impacted wetlands were groundwater recharge/discharge and wildlife habitat. Each wetland feature was visually assessed during the monitoring efforts to determine if these previously identified functions and values (or any additional functions) were being provided. Based on this assessment, VHB determined that as of 2014, all of the restored and created wetlands are providing the function of Groundwater Recharge/Discharge; in addition, several of the restored or created wetlands showed evidence of functioning as Floodflow Alteration and/or Wildlife Habitat. The results of this assessment are listed, by feature, above in Table 2.

5.1 Vernal Pool Biology Assessment

In Year One (2011), use of three wetlands (WH-WT1, H13-WT2, and H14-WT1) by vernal pool indicator species for breeding was observed during the appropriate season. These wetlands were identified as potential breeding habitat for vernal pool species prior to the start of mitigation monitoring in 2011. Based on the negative results of a vernal pool assessment for biological indicator species conducted in Year Two, VHB did not conduct a similar assessment in Years Three or Four. During Years Two and Three, there had been evidence of use by other amphibian species in two wetlands (H5-Create and H13-WT2). VHB does not recommend continuing to conduct separate surveys for vernal pool species during the remaining monitoring efforts, however, observations made during the typical late spring field visits should show if any of the target wetlands are used by vernal pool indicator species.

6.0 Stream Assessments

In addition to the assessment of the herbaceous and shrub vegetation communities within the restored floodplains of the larger stream restoration sites, VHB conducted a visual assessment of the stream conditions within the restored stream segments. In order to assess stream condition, VHB observed and noted such characteristics as signs of erosion and evidence of channel development (including substrate sorting, occupation of the floodplain, and sediment deposition). Overall, the restored streams continue to develop and naturalize in a stable manner. Several streams show evidence of accessing the created floodplains during high precipitation events, with minimal erosion occurring; signs include sediment deposits in the floodplain and continued healthy vegetation (herbaceous and woody) growth after the high precipitation events. Evidence was observed that significant substrate sorting has taken place in all of the restored streams. Additionally, streams repaired during 2012 and 2013 were observed to be stable during 2014.

During 2014, bank sloughing was repaired on a segment of Stream P2-TB-1 between Jay Peak Road and Condo Road. The repair will be monitored for bank stability and naturalization during the 2015 monitoring. As part of the normal photograph collection for monitoring, each restored stream was photographed to show representative conditions (see Golf Course Mitigation Monitoring – Year Four Photographs on pages 29 through 50 of the Appendix).

7.0 Invasive Plant Species

During prior monitoring years, VHB observed a small population (approximately 10 feet by 10 feet) of common reed (*Phragmites australis*) within Wetland H4-WT1/2. This population has previously been hand cut and treated with herbicide at various times during the growing seasons of 2009 through 2013, prior to which time it is was approximately the same dimensions. During the Year Four monitoring, this population of common reed was not observed, indicating that the prior cutting and targeted treatment with herbicide is having an effect. Monitoring for common reed should continue and be treated as necessary to ensure that it does not spread to other restored or created features.

During the 2013 monitoring, VHB observed a small population of reed canary grass (*Phalaris arundinacea*) in Wetland H13-WT3. This population was approximately two feet by two feet in size and was hand removed for disposal off-site. During the 2014 monitoring, this population of reed canary grass was not observed. A very small population of reed canary grass was observed at Wetland H11-WT2/3, during the 2014 monitoring effort. This population was hand removed and disposed of off-site. Monitoring and treatment for reed canary grass should continue to ensure that spread to other restored or created features does not occur.

8.0 Remedial Actions

Remedial actions taken during 2014 include bank slough repair to a segment of Stream P2-TB1 located between Jay Peak Road and Condo Road. As discussed in the *Jay Peak Resort – Golf Course Wetland and Stream Mitigation - Third Annual (2013) Mitigation Monitoring Report* ("Year Three Report") (VHB 2014), JPR performed minor repairs in summer 2013, in Stream P2-TB1, which had sustained three areas of bank failure in 2012. This area was monitored by VHB during 2014 and the repairs were observed to be stable. Remedial actions taken during 2014, in addition to remedial actions taken in years prior, will be monitored during 2015.

9.0 Conclusions/Recommendations

Overall, the JPR golf course mitigation areas are meeting or exceeding performance standards. Field monitoring efforts identified average, overall herbaceous vegetation cover of over 100 percent; and overall shrub survival rates of approximately 80 percent. Both of these results meet or exceed the 80 percent herbaceous cover and the 80 percent shrub survival rate performance standards which were set in the Mitigation Plan.

Based on the 2014 results, VHB anticipates that both the herbaceous cover and shrub survival rates within the various restoration and creation areas should continue to meet or surpass the performance criteria. Although the overall shrub survival rate was found to be at the lower end of the acceptable 80 percent survival performance standard in 2014, this should not be a significant concern, since the shrubs were planted to provide minimal structural diversity in the vegetation community and soil stability, and not to develop into shrub wetlands. Additionally, since the shrubs that have survived into 2014 have been observed to be thriving and natural recruits have begun to emerge in a portion of the features, the overall goal of shrubs providing structure to the vegetation communities, including a minimum of areal coverage and prevention of soil erosion, would be met should the survival rate fall below the performance standard.

Finally, the signed *Mitigation Report Transmittal and Self-Certification* form as provided by the USACE's 7-20-10 New England District Compensatory Mitigation Guidance is provided on page 51 of the Appendix.

10.0 References

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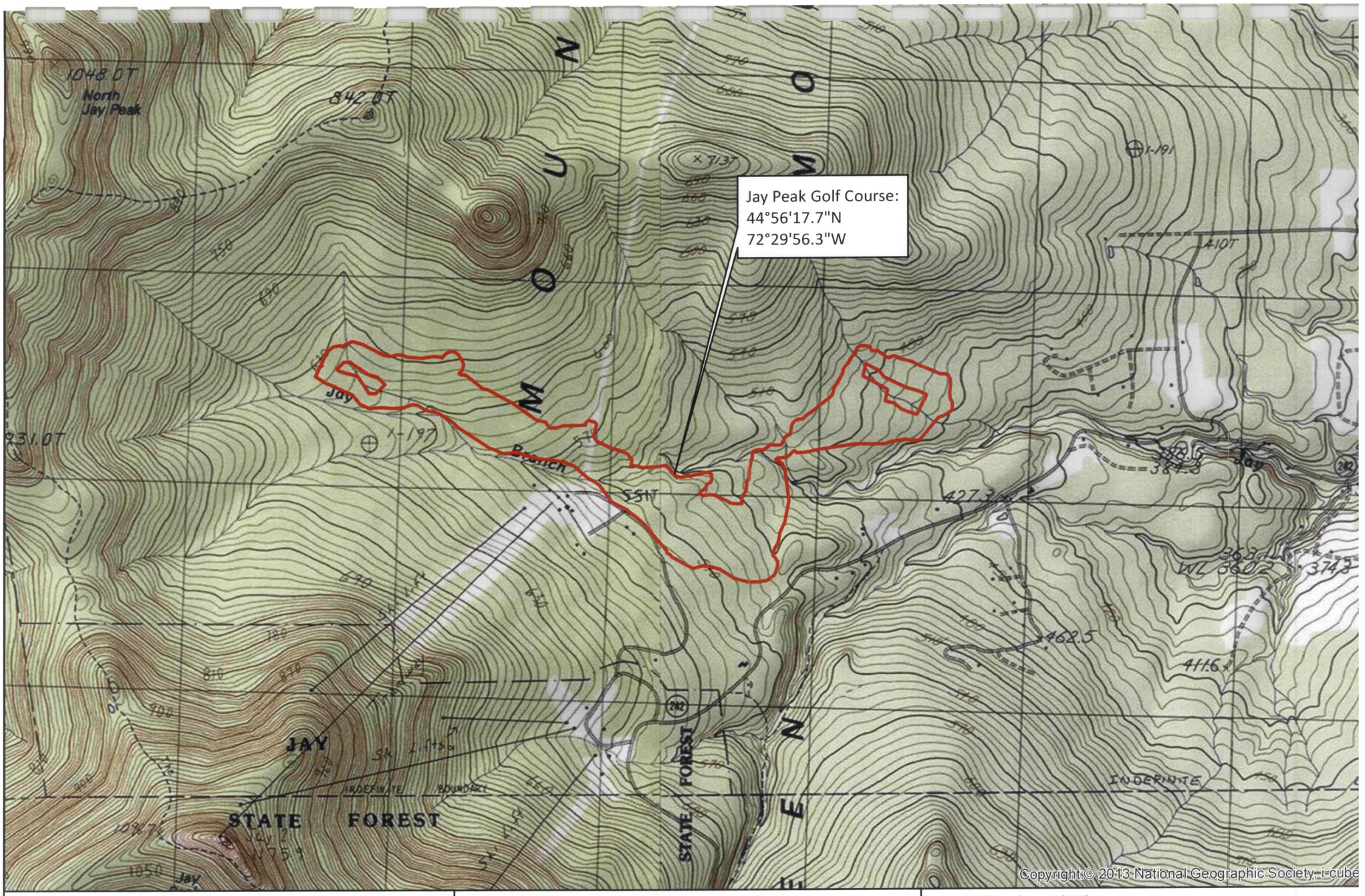
VHB. 2013. *Jay Peak Resort – Golf Course Wetland and Stream Mitigation – Second Annual (2012) Mitigation Monitoring Report.*

VHB. 2014. *Jay Peak Resort – Golf Course Wetland and Stream Mitigation – Third Annual (2013) Mitigation Monitoring Report.*

APPENDIX



Legend

Golf Course Investigation Area

N
W E
S

Jay Peak Resort Golf Course
Jay, Vermont
Site Location Map

December 15, 2014

2,000 1,000 0 2,000
Feet

Sources: USGS Topos from NGS (2013)
Investigation area digitized by VHB (2008).

vhb

\\vtnfdata\projects\57276.03\GIS\project\JPR GC Mitigation Monitoring - Year 4\JPR_GC_Site Location Map.m

Legend

- Approximate Golf Course Investigation Area
- Sheet Index
- Road (VTrans)

700 350 0 700
Feet

Jay Peak Resort Golf Course
Jay, Vermont
Golf Course Mitigation Monitoring Index Map

October 27, 2014

N

Sources: Ortho from Bing (2014); Roads from VTrans (2011); Sheet Index of VHB Maps and VHB Investigation Area (2010).

Prepared by: PBW

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Legend

Permanent Monitoring Points
- Wetland Data Plot
- Vegetation Plot
- Photo Point

- Wetland Restoration/ Creation
- Stream Channel Restoration
- VHB Wetlands (2008-2012)
- VHB Streams (2008-2012)
- Stream (VHD)

Culverts
- New Culvert
- Remaining Culvert
- Stormwater Drainage Culvert

Jay Peak Resort - Jay, Vermont
Golf Course Mitigation Monitoring

Map 1 of 7

October 27, 2014

150 75 0 150

Feet

N

Prepared by: PBW

vhb

Sources: Background: Ortho from Bing (2014); VHD Streams provided by VCGI (2010); Wetlands, Culverts and Stream Features field- delineated by VHB (2008-2012); Restoration Areas GPS'd by VHB (2009-2010); Permanent wetland data, vegetation and photograph monitoring points established and GPS'd by VHB (2011).

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Legend

Permanent Monitoring Points
- Wetland Data Plot
- Vegetation Plot
- Photo Point

- Wetland Restoration/ Creation
- Stream Channel Restoration
- VHB Wetlands (2008-2012)
- VHB Streams (2008-2012)
- Stream (VHD)

Culverts
- New Culvert
- Remaining Culvert
- Stormwater Drainage Culvert

Jay Peak Resort - Jay, Vermont
Golf Course Mitigation Monitoring
Map 2 of 7

October 27, 2014

150 75 0 150

Feet

N

Prepared by: PBW

vhb

Sources: Background: Ortho from Bing (2014); VHD Streams provided by VCGI (2010); Wetlands, Culverts and Stream Features field- delineated by VHB (2008-2012); Restoration Areas GPS'd by VHB (2009-2010); Permanent wetland data, vegetation and photograph monitoring points established and GPS'd by VHB (2011).

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Legend

- Permanent Monitoring Points
- Wetland Data Plot
- Vegetation Plot
- Photo Point
- Wetland Restoration/ Creation
- Stream Channel Restoration
- VHB Wetlands (2008-2012)
- VHB Streams (2008-2012)
- Stream (VHD)

Culverts

- New Culvert
- Remaining Culvert
- Stormwater Drainage Culvert

Jay Peak Resort - Jay, Vermont
Golf Course Mitigation Monitoring

Map 3 of 7

October 27, 2014

150 75 0 150

Feet

N

Prepared by: PBW

vhb

Sources: Background: Ortho from Bing (2014); VHD Streams provided by VCGI (2010); Wetlands, Culverts and Stream Features field- delineated by VHB (2008-2012); Restoration Areas GPS'd by VHB (2009-2010); Permanent wetland data, vegetation and photograph monitoring points established and GPS'd by VHB (2011).

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Legend

Permanent Monitoring Points
- Wetland Data Plot
- Vegetation Plot
- Photo Point

- Wetland Restoration/ Creation
- Stream Channel Restoration
- VHB Wetlands (2008-2012)
- VHB Streams (2008-2012)
- Stream (VHD)

Culverts
- New Culvert
- Remaining Culvert
- Stormwater Drainage Culvert

Jay Peak Resort - Jay, Vermont
Golf Course Mitigation Monitoring

Map 4 of 7

October 27, 2014

150 75 0 150

Feet

N

vhb

Sources: Background: Ortho from Bing (2014); VHD Streams provided by VCGI (2010); Wetlands, Culverts and Stream Features field- delineated by VHB (2008-2012); Restoration Areas GPS'd by VHB (2009-2010); Permanent wetland data, vegetation and photograph monitoring points established and GPS'd by VHB (2011).

Prepared by: PBW

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Legend

Permanent Monitoring Points
- Wetland Data Plot
- Vegetation Plot
- Photo Point

- Wetland Restoration/ Creation
- Stream Channel Restoration
- VHB Wetlands (2008-2012)
- VHB Streams (2008-2012)
- Stream (VHD)

Culverts
- New Culvert
- Remaining Culvert
- Stormwater Drainage Culvert

Jay Peak Resort - Jay, Vermont
Golf Course Mitigation Monitoring

Map 5 of 7

October 27, 2014

150 75 0 150
Feet

N

Prepared by: PBW

vhb

Sources: Background: Ortho from Bing (2014); VHD Streams provided by VCGI (2010); Wetlands, Culverts and Stream Features field- delineated by VHB (2008-2012); Restoration Areas GPS'd by VHB (2009-2010); Permanent wetland data, vegetation and photograph monitoring points established and GPS'd by VHB (2011).

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Legend

- Permanent Monitoring Points
- Wetland Data Plot
- Vegetation Plot
- Photo Point
- Wetland Restoration/ Creation
- Stream Channel Restoration
- VHB Wetlands (2008-2012)
- VHB Streams (2008-2012)
- Stream (VHD)

Culverts

- New Culvert
- Remaining Culvert
- Stormwater Drainage Culvert

Jay Peak Resort - Jay, Vermont
Golf Course Mitigation Monitoring
Map 6 of 7

October 27, 2014

150 75 0 150

Feet

N

Prepared by: PBW

vhb

Sources: Background: Ortho from Bing (2014); VHD Streams provided by VCGI (2010); Wetlands, Culverts and Stream Features field- delineated by VHB (2008-2012); Restoration Areas GPS'd by VHB (2009-2010); Permanent wetland data, vegetation and photograph monitoring points established and GPS'd by VHB (2011).

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Legend

Permanent Monitoring Points
- Wetland Data Plot
- Vegetation Plot
- Photo Point

- Wetland Restoration/ Creation
- Stream Channel Restoration
- VHB Wetlands (2008-2012)
- VHB Streams (2008-2012)
- Stream (VHD)

Culverts
- New Culvert
- Remaining Culvert
- Stormwater Drainage Culvert

Jay Peak Resort - Jay, Vermont
Golf Course Mitigation Monitoring
Map 7 of 7

October 27, 2014

150 75 0 150
Feet

N

vhb

Sources: Background: Ortho from Bing (2014); VHD Streams provided by VCGI (2010); Wetlands, Culverts and Stream Features field- delineated by VHB (2008-2012); Restoration Areas GPS'd by VHB (2009-2010); Permanent wetland data, vegetation and photograph monitoring points established and GPS'd by VHB (2011).

Prepared by: PBW

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Jay Peak Resort Golf Course Mitigation
Year Four (2014) Mitigation Monitoring Report
Herbaceous Species and Cover Summary Data from 1m² Plots and Wetland Data Plots
December 15, 2014

Scientific Name[1,2]	Common Name	Indicator Status[3]	VHB Mitigation Monitoring Map 1 of 7[5]								Map 2 of 7		Map 3 of 7	Map 4 of 7			Map 5 of 7	Map 6 of 7										Map 7 of 7						
			H5-TB1	H5-Create		H6-WT1		WH-WT1	H6-TB1	WH-WT2	H4-WT1	H4-WT3	H8-Create	H1-WT1	P2-TB1		H11-WT2/3	H11-TB2	H11-Create		H11-WT6		H12-TB1u	H16-WT1/ H11-WT1	H16-Create			H16-SC1	H13-WT1/1a/1b	H13-WT2		H13-WT3	H14-WT2/3	H14-WT1	H15-WT1
			Stream	Wetland		Wetland		Wetland	Stream	Wetland	Wetland	Wetland	Wetland	Wetland	Stream		Wetland	Stream	Wetland		Wetland		Stream	Wetland	Wetland			Stream	Wetland	Wetland		Wetland	Wetland	Wetland
			H5-TB1-V1[6]	H5-Create-V1	H5-Create-W1[6]	H6-WT1-V1	H6-WT1-W1	WH-WT1-V1	H6-TB1-V1	WH-WT2-V1	H4-WT1/2-V1	H4-WT3-V1	H8-Create-W1	H1-WT1-V1	P2-TB1 (in GC) -V1	P2-TB1 (off GC)-V1	H11-WT2/3-V1	H11-TB2-V1	H11-Create-W1	H11-Create-V1	H11-WT6-W1	H11-WT6-V1	H12-TB1u-V1	H16-WT1/ H11-VT1	H16-Create-W1	H16-Create-V1	H16-Create-V2	H16-SC1-V1	H13-WT1/1a/1b-W1	H13-WT2-V1	H13-WT2-V2	H13-WT3-V1	H14-WT2/3-W1	H14-WT1d-V1	H15-WT1-W1
			APPROXIMATE COVERAGE WITHIN VEGETATION MONITORING AND WETLAND DATA PLOTS[4]																																
Alisma subcordatum Raf.	American water plantain	OBL																															1	
Anaphalis margaritacea (L.) Benth.	pearly everlasting	FACU																																3
Asclepias incarnata L.	swamp milkweed	OBL							3		1																15							1
Carex comosa Boott	longhair sedge	OBL		3	3	3	15	38		3	3		15	3	3		3	15			38	38	38	3		3		3	38	3	3		3	3	15
Carex crinita Lam.	fringed sedge	OBL				3	3	3		15	15	38					3	3			3	3	3			3	3	15	15	15	15	3		3	38
Carex lacustris Willd.	hairy sedge	OBL		3																														
Carex scoparia Schkuhr ex Willd.	broom sedge	FACW			15		15	3		3		15	15		15		38	3	15	15	15	15	15	38	38	3	3	3	3	15	3		3	3	
Carex vulpinoidea Michx.	fox sedge	OBL	38	3	15	63			38	38			3	38	3				38	38	15		15	15	15	38	15	3		3		3	38		
Eleocharis obtusa (Willd.) J.A. Schultes	blunt spikerush	OBL																													15			
Elymus virginicus L.	Virginia wildrye	FACW														3																		
Epilobium coloratum Biehler	purpleleaf willowherb	OBL								1																	3				3			
Equisetum arvense L.	field horsetail	FAC				15	38																							3				
Epilobium palustre L.	Marsh willowherb	OBL																																
Eupatorium perfoliatum L.	common boneset	FACW		1	15	15	38	15	38	3	3			3	3		15	15	15	15	15	3		15	15	15	15	15		3	3		15	3	3
Euthamia graminifolia (L.) Nutt.	flat-top goldentop	FAC	3		1	1	3			1	3	3		15	1			3		3	3	3					15		3	15	3				3
Eutrochium maculatum (L.) E.E. Lamont	spotted joepyeweed	OBL			3			3	3	3	3	1			3		15	3			3	3	3		3	3		3			3	3	3	3	
Festuca rubra L.	red fescue	FACU								1																								
Galium mollugo	false baby's breath	FACU													3																			
Galium palustre L.	common marsh bedstraw	OBL								3	3						3								1	1		3				3	3	
Glyceria canadensis (Michx.) Trin.	rattlesnake mannagrass	OBL						1			3				1																			
Glyceria grandis S. Wats.	American mannagrass	OBL																												15			3	
Glyceria striata (Lam.) A.S. Hitchc.	fowl mannagrass	OBL																											3		63	15		
Helonias bullata L.	swamppink	OBL	3																															
Hypericum perforatum L.	common St. Johnswort	UPL																							15									
Impatiens capensis Meerb.	jewelweed	FACW									38		38			38	38	3							3	3		15		3	3	15			
Juncus effusus L.	common rush	OBL	38	38	38	15	38			38	3	3	38	38	15		38	3	15	63	3	38	38	15	15	63	38	15	3	3	15		15	15	
Juncus tenuis Willd.	poverty rush	FAC		15	3													3	15				3	3		3	1		3	3	3		3		
Leersia oryzoides (L.) Sw.	rice cutgrass	OBL																													15			
Leucanthemum vulgare Lam.	oxeye daisy	FACU	3																															
Lotus corniculatus L.	Bird's-foot trefoil	FACU													3	15		15	15															
Lycopus americanus Muhl. ex W. Bart.	American water horehound	OBL																							3			3	3	3	15			
Mimulus ringens L.	Allegheny monkeyflower	OBL	1	3	15			3	15						1				15	3			3	3	3			3	3			15		
Onoclea sensibilis L.	sensitive fern	FACW										15															1				3		1	1
Phalaris arundinacea L.	*reed canarygrass*	*FACW*															*1*				-													
Poa compressa L.	Canada bluegrass	FACU																			38													
Polygonum sagittatum L.	arrowleaf tearthumb	OBL						3												3					1		1			3				

Jay Peak Resort Golf Course Mitigation
Year Four (2014) Mitigation Monitoring Report
Herbaceous Species and Cover Summary Data from 1m² Plots and Wetland Data Plots
December 15, 2014

Scientific Name[1,2]	Common Name	Indicator Status[3]	VHB Mitigation Monitoring Map 1 of 7[5]								Map 2 of 7		Map 3 of 7	Map 4 of 7			Map 5 of 7	Map 6 of 7										Map 7 of 7						
			H5-TB1	H5-Create		H6-WT1		WH-WT1	H6-TB1	WH-WT2	H4-WT1	H4-WT3	H8-Create	H1-WT1	P2-TB1		H11-WT2/3	H11-TB2	H11-Create		H11-WT6		H12-TB1u	H16-WT1/ H11-WT1	H16-Create			H16-SC1	H13-WT1/1a/1b	H13-WT2		H13-WT3	H14-WT2/3	H14-WT1	H15-WT1
			Stream	Wetland		Wetland		Wetland	Stream	Wetland	Wetland	Wetland	Wetland	Wetland	Stream		Wetland	Stream	Wetland		Wetland		Stream	Wetland	Wetland			Stream	Wetland	Wetland		Wetland	Wetland	Wetland	Wetland
			H5-TB1-V1[6]	H5-Create-V1	H5-Create-W1[6]	H6-WT1-V1	H6-WT1-W1	WH-WT1-V1	H6-TB1-V1	WH-WT2-V1	H4-WT1/2-V1	H4-WT3-V1	H8-Create W1	H1-WT1-V1	P2-TB1 (in GC) -V1	P2-TB1 (off GC)-V1	H11-WT2/3-V1	H11-TB2-V1	H11-Create-W1	H11-Create-V1	H11-WT6-W1	H11-WT6-V1	H12-TB1u V1	H16-WT1/ H11 VT1	H16-Create-W1	H16-Create-V1	H16-Create-V2	H16-SC1-V1	H13-WT1/1a/1b-W1	H13-WT2-V1	H13-WT2-V2	H13-WT3-V1	H14-WT2/3-W1	H14-WT1d-V1	H15-WT1-W1
			APPROXIMATE COVERAGE WITHIN VEGETATION MONITORING AND WETLAND DATA PLOTS[4]																																
Potentilla simplex Michx.	common cinquefoil	FACU							3																										
Ranunculus acris L.	tall buttercup	FAC														3		3																	
Scirpus atrovirens Willd.	green bulrush	OBL		1				3		1						1	3	3			3							3			3		38	
Scirpus cyperinus (L.) Kunth	woolgrass	OBL		15			3			3	15	3					3								3	3		15	3				3	
Scirpus hattorianus Makino	mosquito bulrush	OBL						3			3		15													1		15	3			3	3	
Solidago gigantea	giant goldenrod	FACW				3				3		15	15	15	38				3		15						15					15		15
Solidago rugosa P. Mill.	wrinkleleaf goldenrod	FAC									3		3								15	15	15					15	15					
Symphyotrichum novae-angliae (L.) Nesom	New England aster	FACW	15		3	15		3			3	15		1			3	3	3		3	3	15				3							1
Thalictrum pubescens Pursh	king of the meadow	FACW																																1
Thelypteris palustris Schott	eastern marsh fern	FACW					15				3										15													
Trifolium pratense L.	red clover	FACU														15		3																
Trifolium repens L.	white clover	FACU														3																		
Typha angustifolia L.	narrowleaf cattail	OBL															1																	
Typha latifolia L.	broadleaf cattail	OBL		15			3	15			38																		15	3	3			
Verbena hastata L.	swamp verbena	FACW	3	3	3		1	3	3	3	1		15	3	3		15		15	3		3	15	3		3	15	3			15		3		3
Vicia sativa L.	garden vetch	FACU													3																3			
% Cover/Sampling Plot[4]			**104**	**100**	**114**	**133**	**172**	**96**	**103**	**119**	**141**	**108**	**157**	**116**	**92**	**78**	**179**	**78**	**149**	**143**	**181**	**127**	**163**	**95**	**115**	**142**	**125**	**102**	**119**	**108**	**132**	**99**	**134**	**82**	**84**
Average % Cover/ Feature			**104**	**107**		**153**		**96**	**103**	**119**	**141**	**108**	**157**	**116**	**85**		**179**	**78**	**146**		**154**		**163**	**95**	**127**			**102**	**119**	**120**		**99**	**134**	**82**	**84**

Total Average % Cover for All Mitigation Wetlands:	**123**
Total Average % Cover for Restored Stream Floodplains:	**106**
TOTAL Average % Herbaceous Cover:	**119**

Notes:

[2] Species nomenclature follows the USDA Plants Database (USDA - NRCS 2014)

[2] Species identification follows Haines, Arthur. 2011. *Flora Novae Angliae: A Manual for the Identificaiton of Native and Naturalized Higher Vascular Plants of New England*. New England Wildflower Society.

[3] Indicator status follows: *2014 National Wetland Plant List* (Lichvar, R.W., M. Bufferwick, N.C. Melvin, and W.N. Kirchner. 2014. *The National Wetland Plant List: 2014 Update of Wetland Ratings.* Phytoneuron 2014-41: 1-42.

[4] Cover class percentages from visual assessment of 1m² quadrats (including those within wetland data plots) and represents approximate coverage within the quadrat. Approximate mid-point cover classes have been used to report data.

[5] Mapping refers to Jay Peak Resort Golf Course Mitigation Monitoring Set, prepared by VHB, and dated December 17, 2013

[6] Plot names including "V" refer to 1m2 plots used to assess herbaceous vegetation only; plot names incluing "W" refer to data from wetland data plots.

[7] Italics indicate invasive species per the Vermont Class A or B Noxious Weed list (Quarantine #3-Noxious Weeds).

Jay Peak Resort Golf Course Mitigation
Year Four (2014) Mitigation Monitoring Report
Woody Stem Survival Assessment Based on 0.02-acre (5-meter radius) Permanent Vegetation Monitoring Plots and Wetland Data Plots
December 15, 2014

Mitigation Feature	Feature Type	Mitigation Feature Size (acres)	Mitigation Feature Plot	Planted Shrubs within 0.02-acre (5m-radius) Plots	Total Found Planted Shrubs Within Feature	Total Shrubs Planted[1]	Approximate Survival Rate of Shrubs/ Feature (%)
H6-WT1	WETLANDS	0.31	H6-WT1-V1	7	108	150	72%
			H6-WT1-W1	7			
WH-WT2		0.10	WH-WT2-V1	4	20	20	98%
WH-WT1		0.03	WH-WT1-V1	15	24	35	69%
H5-Create		0.24	H5-Create-V1	10	116	152	76%
			H5-Create-W1	9			
H14-WT2/3		0.05	H14-WT2/4-W1	12	32	46	69%
H14-WT1		0.07	H14-WT1-V1	2	7	8	93%
H16-WT1/Create/ H11-WT1[2]		0.66	H16-WT1/H11-WT1-V1	4	107	150	71%
			H16-Create-W1	3			
			H16-Create-V1	4			
			H16-Create-V2	2			
H1-WT1		0.06	H1-WT1-V1	9	25	37	69%
H11-WT6		0.09	H11-WT6-V1	7	30	41	74%
			H11-WT6-W1	7			
H11-WT2/3		0.03	H11-WT2/3-V1	13	17	25	68%
H11-Create		0.36	H11-Create-W1	7	135	185	73%
			H11-Create-V1	8			
H4-WT1/2		0.02	H4-WT1/2-V1	8	8	10	75%
H4-WT3		0.04	H4-WT3-V1	5	9	10	89%
H8-Create		0.13	H8-Create-W1	4	26	30	85%
H13-WT1/1a/1b		0.06	H13-WT1/1a/1b-W1	5	14	16	87%
H13-WT2		0.18	H13-WT2-V1	3	31	45	69%
			H13-WT2-V2	4			
H13-WT3		0.01	H13-WT3-V1	12	15	16	94%
H15-WT1		0.03	H15-WT1-W1	11	23	25	92%
H6-TB1	STREAMS	0.26	H6-TB1-V1	5	65	75	86%
H5-TB1		0.17	H5-TB1-V1	9	75	81	92%
H16-SC1		0.18	H16-SC1-V1	4	35	55	64%
H11-TB2		0.19	H11-TB2-V1	6	56	80	70%
H12-TB1u		0.15	H12-TB1u-V1	6	44	45	97%
P2-TB1		0.25	P2-TB1-V1	4	43	54	80%
			P2-TB1-V2	3			
				AVERAGE SURVIVAL RATE OF PLANTED SHRUBS WITHIN WETLANDS:			79%
				AVERAGE SURVIVAL RATE OF PLANTED SHRUBS WITHIN RESTORED STREAM FLOODPLAINS:			82%
				TOTAL AVERAGE SURVIVAL RATE OF PLANTED SHRUBS:			**80%**

[1]Total plantings as reported in the *Post Construction Report - Wetland/Stream Restoration - Jay Peak Golf Course* , by New England Environmental, Inc. (NEE), dated August 23, 2010; this assessment of planted shrub survival includes those shrubs planted for wetland and stream enhancement (winterberry holly (*Ilex verticillata*), elderberry (*Sambucus canadensis*), American cranberry (*Viburnum trilobum*), and red-osier dogwood (*Cornus sericea*)), but does not include the additional *Salix* sp. and *Cornus* sp. tublelings planted as part of the streambank stabilization plan.

[2] The shrub planting summary provided by NEE combined the wetlands areas H16-WT1/H11-WT1 and H16-Create, although for permitting purposes these were considered separate features.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

H5-Create

Project Site: JPR Golf Course Wetland Mitigation | City/County: Jay/Orleans | Samp. Date: 8/5/2014
Applicant/Owner: Jay Peak Resort | State: VERMONT | Sampling Point: H5-Create
Investigator(s): P. Werts-Kallfelz | Section, Township, Range: Jay
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Concave | Slope (%):
Subregion (LRR or MLRA): LRR | Lat: 44°56'32.632"N | Long: 72°29'0.229"W | Datum: NAD 83
Soil Map Unit: Cabot | NWI Class: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? YES (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? NO | Normal Circumstances? YES
Are Vegetation, Soil, or Hydrology naturally problematic? NO | (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	YES	Is This Sample Area Within a Wetland? YES
Hydric Soil Present?	YES	
Wetland Hydrology Present?	YES	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

	Surface Water (A1)	X	Water-Stained Leaves (B9)
	High Water Table (A2)		Aquatic Fauna (B13)
	Saturation (A3)		Marl Deposits (B13)
	Water Marks (B1)		Hydrogen Sulfide Odor (C1)
	Sediment Deposits (B2)	X	Oxidized Rhizospheres on Living Roots (C3)
	Drift Deposits (B3)		Presence of Reduced Iron (C4)
	Algal Mat or Crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron Deposits (B5)		Thin Muck Surface (C7)
	Inundation Visible on Aerial (B7)		Other (Explain in Remarks)
	Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (minimum of two required)

	Surface Soil Cracks (B6)
X	Drainage Patterns (B10)
	Moss Trim Lines (B16)
	Dry-Season Water Table (C2)
	Crayfish Burrows (C8)
	Saturation Visible on Aerial (C9)
	Stunted or Stressed Plants (D1)
	Geomorphic Position (D2)
	Shallow Aquitard (D3)
	Microtopographic Relief (D4)
	FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Depth (inches):
Water Table Present? Depth (inches):
Saturation Present? Depth (inches):
Wetland Hydrology Present? YES

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
1.29" in the last 5 days at Jay Peak (NOAA)

Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(in)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 4/2	97	7.5YR 5/6	3	C	M	SILT LOAM	
10-14+	2.5Y 5/2	98	7.5YR 5/6	2	C	M	SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

	Histosol (A1)		Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
	Histic Epipedon (A2)		Thin Dark Surface (S9) (LRR R, MLRA 149B)
	Black Histic (A3)		Loamy Mucky Mineral (F1) (LRR K, L)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)
	Stratified Layers (A5)	X	Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	Sandy Gleyed Matrix (S4)		
	Sandy Redox (S5)		
	Stripped Matrix (S6)		
	Dark Surface (S7) (LRR R, MLRA 149B)		

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10) (LRR K, L, MLRA 149B)
	Coast Prairie Redox (A16) (LRR K, L, R)
	5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
	Dark Surface (S9) (LRR K, L, M)
	Polyvalue Below Surface (S8) (LRR K, L)
	Thin Dark Surface (S9) (LRR K, L)
	Iron-Manganese Masses (F12) (LRR K, L, R)
	Piedmont Floodplain Soils (F19) (MLRA 149B)
	Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
	Red Parent Material (F21)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):
Hydric Soil Present? YES

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: **H5-Create**

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Shrub Stratum (Plot size: 15'RAD)			
1. **Viburnum opulus**	3	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	3	= Total Cover	
Herb Stratum (Plot size: 5' RAD)			
1. **Juncus effusus**	38	X	OBL
2. **Carex vulpinoidea**	15	X	OBL
3. **Carex scoparia**	15	X	FACW
4. **Eupatorium perfoliatum**	15	X	FACW
5. **Mimulus ringens**	15	X	OBL
6. **Eutrochium maculatum**	3		OBL
7. **Verbena hastata**	3		FACW
8. **Juncus tenuis**	3		FAC
9. **Carex comosa**	3		OBL
10. **Symphyotrichum novae-angliae**	3		FACW
11. **Euthamia graminifolia**	1		FAC
12.			
	114	= Total Cover	
Woody Vines (Plot size:)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Dominance Test Worksheet:

Dominants OBL, FACW, FAC: **6** (A)

Dominants across all strata: **6** (B)

% Dominants OBL, FACW, FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply By:
OBL	**74**	x 1 = **74**
FACW	**39**	x 2 = **78**
FAC	**4**	x 3 = **12**
FACU		x 4 =
UPL		x 5 =
Sum:	**117** (A)	**164** (B)

Prevalence Index = B/A = **1.40**

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is > 50%
- **X** Prevalence Index is <= 3.0
- ___ Problematic Hydrophytic Vegetation[1] (explain)
- ___ Rapid Test for Hydrophytic Vegetation
- ___ Morphological Adaptations

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **YES**

Remarks: (If observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

H6-WT1

Project Site: JPR Golf Course Wetland Mitigation | City/County: Jay/Orleans | Samp. Date: 8/5/2014
Applicant/Owner: Jay Peak Resort | State: VERMONT | Sampling Point: H6-WT1
Investigator(s): P. Werts-Kallfelz | Section, Township, Range: Jay
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Concave | Slope (%):
Subregion (LRR or MLRA): LRR | Lat: 44°56'40.729"N | Long: 72°29'7.534"W | Datum: NAD 83
Soil Map Unit: Cabot | NWI Class: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? YES (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? NO | Normal Circumstances? YES
Are Vegetation, Soil, or Hydrology naturally problematic? NO | (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	YES	Is This Sample Area Within a Wetland? YES
Hydric Soil Present?	YES	
Wetland Hydrology Present?	YES	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

	Surface Water (A1)		Water-Stained Leaves (B9)
X	High Water Table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		Marl Deposits (B13)
	Water Marks (B1)		Hydrogen Sulfide Odor (C1)
	Sediment Deposits (B2)		Oxidized Rhizospheres on Living Roots (C3)
	Drift Deposits (B3)		Presence of Reduced Iron (C4)
	Algal Mat or Crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron Deposits (B5)		Thin Muck Surface (C7)
	Inundation Visible on Aerial (B7)	small pockets of st	Other (Explain in Remarks)
	Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (minimum of two required)

	Surface Soil Cracks (B6)
	Drainage Patterns (B10)
	Moss Trim Lines (B16)
	Dry-Season Water Table (C2)
	Crayfish Burrows (C8)
	Saturation Visible on Aerial (C9)
	Stunted or Stressed Plants (D1)
	Geomorphic Position (D2)
	Shallow Aquitard (D3)
	Microtopographic Relief (D4)
	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?		Depth (inches):	
Water Table Present?	X	Depth (inches):	Surface
Saturation Present?	X	Depth (inches):	Surface

Wetland Hydrology Present? YES

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
1.29" in the last 5 days at Jay Peak (NOAA)

Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(in)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	98	7.5YR 3/4	2	C	M	SILT LOAM	
8-14+	2.5Y 5/1	95	7.5YR 4/6	5	C	M	LOAMY SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

	Histosol (A1)		Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
	Histic Epipedon (A2)		Thin Dark Surface (S9) (LRR R, MLRA 149B)
	Black Histic (A3)		Loamy Mucky Mineral (F1) (LRR K, L)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)
	Stratified Layers (A5)	X	Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	Sandy Gleyed Matrix (S4)		
	Sandy Redox (S5)		
	Stripped Matrix (S6)		
	Dark Surface (S7) (LRR R, MLRA 149B)		

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10) (LRR K, L, MLRA 149B)
	Coast Prairie Redox (A16) (LRR K, L, R)
	5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
	Dark Surface (S9) (LRR K, L, M)
	Polyvalue Below Surface (S8) (LRR K, L)
	Thin Dark Surface (S9) (LRR K, L)
	Iron-Manganese Masses (F12) (LRR K, L, R)
	Piedmont Floodplain Soils (F19) (MLRA 149B)
	Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
	Red Parent Material (F21)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):

Hydric Soil Present? YES

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: **H6-WT1**

		Absolute % Cover	Dom. Sp?	Indicator Status
Tree Stratum	(Plot size:)			
1.				
2.				
3.				
4.				
5.				
6.				
7.				
			= Total Cover	
Sapling Stratum	(Plot size:)			
1.				
2.				
3.				
4.				
5.				
6.				
7.				
			= Total Cover	
Shrub Stratum	(Plot size: **15'RAD**)			
1.				
2.				
3.				
4.				
5.				
6.				
7.				
			= Total Cover	
Herb Stratum	(Plot size: **5' RAD**)			
1.	**Eupatorium perfoliatum**	**38**	**X**	**FACW**
2.	**Juncus effusus**	**38**	**X**	**OBL**
3.	**Equisetum arvense**	**38**	**X**	**FAC**
4.	**Carex comosa**	**15**		**OBL**
5.	**Thelypteris palustris**	**15**		**FACW**
6.	**Carex scoparia**	**15**		**FACW**
7.	**Euthamia graminifolia**	**3**		**FAC**
8.	**Typha latifolia**	**3**		**OBL**
9.	**Carex crinita**	**3**		**OBL**
10.	**Scirpus cyperinus**	**3**		**OBL**
11.	**Verbena hastata**	**1**		**FACW**
12.				
		172	= Total Cover	
Woody Vines	(Plot size:)			
1.				
2.				
3.				
4.				
5.				
			= Total Cover	

Dominance Test Worksheet:

Dominants OBL, FACW, FAC: **3** (A)

Dominants across all strata: **3** (B)

% Dominants OBL, FACW, FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply By:
OBL	**62**	x 1 =	**62**
FACW	**69**	x 2 =	**138**
FAC	**41**	x 3 =	**123**
FACU		x 4 =	
UPL		x 5 =	
Sum:	**172** (A)		**323** (B)

Prevalence Index = B/A = **1.88**

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is > 50%
- **X** Prevalence Index is <= 3.0
- ___ Problematic Hydrophytic Vegetation[1] (explain)
- ___ Rapid Test for Hydrophytic Vegetation
- ___ Morphological Adaptations

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **YES**

Remarks: (If observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

H8-Create

Project Site: JPR Golf Course Wetland Mitigation | City/County: Jay/Orleans | Samp. Date: 8/4/2014
Applicant/Owner: Jay Peak Resort | State: VERMONT | Sampling Point: H8-Create
Investigator(s): P. Werts-Kallfelz | Section, Township, Range: Jay
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Concave | Slope (%):
Subregion (LRR or MLRA): LRR | Lat: 44°56'21.345"N | Long: 72°29'37.266"W | Datum: NAD 83
Soil Map Unit: Dixfield | NWI Class: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? YES (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? NO | Normal Circumstances? YES
Are Vegetation, Soil, or Hydrology naturally problematic? NO | (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	YES	Is This Sample Area Within a Wetland? YES
Hydric Soil Present?	YES	
Wetland Hydrology Present?	YES	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

	Surface Water (A1)	X	Water-Stained Leaves (B9)
X	High Water Table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		Marl Deposits (B13)
	Water Marks (B1)		Hydrogen Sulfide Odor (C1)
	Sediment Deposits (B2)		Oxidized Rhizospheres on Living Roots (C3)
	Drift Deposits (B3)		Presence of Reduced Iron (C4)
	Algal Mat or Crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron Deposits (B5)		Thin Muck Surface (C7)
	Inundation Visible on Aerial (B7)		Other (Explain in Remarks)
	Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (minimum of two required)

	Surface Soil Cracks (B6)
X	Drainage Patterns (B10)
	Moss Trim Lines (B16)
	Dry-Season Water Table (C2)
	Crayfish Burrows (C8)
	Saturation Visible on Aerial (C9)
	Stunted or Stressed Plants (D1)
	Geomorphic Position (D2)
	Shallow Aquitard (D3)
	Microtopographic Relief (D4)
	FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? | Depth (inches):
Water Table Present? X | Depth (inches): Surface
Saturation Present? X | Depth (inches): Surface
Wetland Hydrology Present? YES

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.89" in the last 5 days at Jay Peak (NOAA)

Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(in)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/1	98	7.5YR 4/4	2	C	M	SILT LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

	Histosol (A1)		Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
	Histic Epipedon (A2)		Thin Dark Surface (S9) (LRR R, MLRA 149B)
	Black Histic (A3)		Loamy Mucky Mineral (F1) (LRR K, L)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)
	Stratified Layers (A5)	X	Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	Sandy Gleyed Matrix (S4)		
	Sandy Redox (S5)		
	Stripped Matrix (S6)		
	Dark Surface (S7) (LRR R, MLRA 149B)		

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10) (LRR K, L, MLRA 149B)
	Coast Prairie Redox (A16) (LRR K, L, R)
	5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
	Dark Surface (S9) (LRR K, L, M)
	Polyvalue Below Surface (S8) (LRR K, L)
	Thin Dark Surface (S9) (LRR K, L)
	Iron-Manganese Masses (F12) (LRR K, L, R)
	Piedmont Floodplain Soils (F19) (MLRA 149B)
	Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
	Red Parent Material (F21)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

Restrictive Layer (if observed):
Type: Bedrock
Depth (inches): 6
Hydric Soil Present? YES

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: **H8-Create**

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Shrub Stratum (Plot size: 15'RAD)			
1. **Cornus alba**	15	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	
Herb Stratum (Plot size: 5' RAD)			
1. **Juncus effusus**	38	X	OBL
2. **Impatiens capensis**	38	X	FACW
3. **Carex comosa**	15	X	OBL
4. **Verbena hastata**	15	X	FACW
5. **Scirpus hattorianus**	15	X	OBL
6. **Carex scoparia**	15	X	FACW
7. **Solidago gigantea**	15	X	FACW
8. **Carex vulpinoidea**	3		OBL
9. **Solidago rugosa**	3		FAC
10.			
11.			
12.			
	157	= Total Cover	
Woody Vines (Plot size:)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Dominance Test Worksheet:

Dominants OBL, FACW, FAC: **8** (A)

Dominants across all strata: **8** (B)

% Dominants OBL, FACW, FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply By:
OBL	**71**	x 1 = **71**
FACW	**98**	x 2 = **196**
FAC	**3**	x 3 = **9**
FACU		x 4 =
UPL		x 5 =
Sum:	**172** (A)	**276** (B)

Prevalence Index = B/A = **1.60**

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is > 50%
- **X** Prevalence Index is <= 3.0
- ____ Problematic Hydrophytic Vegetation[1] (explain)
- ____ Rapid Test for Hydrophytic Vegetation
- ____ Morphological Adaptations

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **YES**

Remarks: (If observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

H11-Create

Project Site: JPR Golf Course Wetland Mitigation | City/County: Jay/Orleans | Samp. Date: 8/4/2014
Applicant/Owner: Jay Peak Resort | State: VERMONT | Sampling Point: H11-Create
Investigator(s): P. Werts-Kallfelz | Section, Township, Range: Jay
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Concave | Slope (%):
Subregion (LRR or MLRA): LRR | Lat: 44°56'29.849"N | Long: 72°30'25.141"W | Datum: NAD 83
Soil Map Unit: Cabot | NWI Class: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? YES (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? NO | Normal Circumstances? YES
Are Vegetation, Soil, or Hydrology naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	YES	Is This Sample Area Within a Wetland? YES
Hydric Soil Present?	YES	
Wetland Hydrology Present?	YES	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

	Surface Water (A1)	X	Water-Stained Leaves (B9)
X	High Water Table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		Marl Deposits (B13)
	Water Marks (B1)		Hydrogen Sulfide Odor (C1)
	Sediment Deposits (B2)		Oxidized Rhizospheres on Living Roots (C3)
	Drift Deposits (B3)		Presence of Reduced Iron (C4)
	Algal Mat or Crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron Deposits (B5)		Thin Muck Surface (C7)
	Inundation Visible on Aerial (B7)		Other (Explain in Remarks)
	Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (minimum of two required)

	Surface Soil Cracks (B6)
	Drainage Patterns (B10)
	Moss Trim Lines (B16)
	Dry-Season Water Table (C2)
	Crayfish Burrows (C8)
	Saturation Visible on Aerial (C9)
	Stunted or Stressed Plants (D1)
	Geomorphic Position (D2)
	Shallow Aquitard (D3)
	Microtopographic Relief (D4)
	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?		Depth (inches):	
Water Table Present?	X	Depth (inches):	Surface
Saturation Present?	X	Depth (inches):	Surface

Wetland Hydrology Present? YES

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.89" in the last 5 days at Jay Peak (NOAA)

Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(in)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	5Y 3/2	100					#N/A	
4-12	2.5Y 5/2	100					SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

	Histosol (A1)		Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
	Histic Epipedon (A2)		Thin Dark Surface (S9) (LRR R, MLRA 149B)
	Black Histic (A3)		Loamy Mucky Mineral (F1) (LRR K, L)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)
	Stratified Layers (A5)	X	Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	Sandy Gleyed Matrix (S4)		
	Sandy Redox (S5)		
	Stripped Matrix (S6)		
	Dark Surface (S7) (LRR R, MLRA 149B)		

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10) (LRR K, L, MLRA 149B)
	Coast Prairie Redox (A16) (LRR K, L, R)
	5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
	Dark Surface (S9) (LRR K, L, M)
	Polyvalue Below Surface (S8) (LRR K, L)
	Thin Dark Surface (S9) (LRR K, L)
	Iron-Manganese Masses (F12) (LRR K, L, R)
	Piedmont Floodplain Soils (F19) (MLRA 149B)
	Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
	Red Parent Material (F21)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):

Hydric Soil Present? YES

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: **H11-Create**

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Shrub Stratum (Plot size: 15'RAD)			
1. **Cornus alba**	15	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	
Herb Stratum (Plot size: 5' RAD)			
1. **Carex vulpinoidea**	38	X	OBL
2. **Verbena hastata**	15	X	FACW
3. **Eupatorium perfoliatum**	15	X	FACW
4. **Juncus effusus**	15	X	OBL
5. **Juncus tenuis**	15	X	FAC
6. **Mimulus ringens**	15	X	OBL
7. **Carex scoparia**	15	X	FACW
8. **Lotus corniculatus**	15	X	FACU
9. **Symphyotrichum novae-angliae**	3		FACW
10. **Solidago gigantea**	3		FACW
11.			
12.			
	149	= Total Cover	
Woody Vines (Plot size:)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Dominance Test Worksheet:

Dominants OBL, FACW, FAC: **8** (A)

Dominants across all strata: **9** (B)

% Dominants OBL, FACW, FAC: **89%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply By:
OBL	68	x 1 =	68
FACW	66	x 2 =	132
FAC	15	x 3 =	45
FACU	15	x 4 =	60
UPL		x 5 =	
Sum:	164 (A)		305 (B)

Prevalence Index = B/A = **1.86**

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is > 50%
- **X** Prevalence Index is <= 3.0
- ___ Problematic Hydrophytic Vegetation[1] (explain)
- ___ Rapid Test for Hydrophytic Vegetation
- ___ Morphological Adaptations

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **YES**

Remarks: (If observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

H11-WT6

Project Site: JPR Golf Course Wetland Mitigation | City/County: Jay/Orleans | Samp. Date: 8/4/2014
Applicant/Owner: Jay Peak Resort | State: VERMONT | Sampling Point: H11-WT6
Investigator(s): P. Werts-Kallfelz | Section, Township, Range: Jay
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Concave | Slope (%):
Subregion (LRR or MLRA): LRR | Lat: 44°56'37.815"N | Long: 72°30'40.383"W | Datum: NAD 83
Soil Map Unit: Cabot | NWI Class: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? YES (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? NO | Normal Circumstances? YES
Are Vegetation, Soil, or Hydrology naturally problematic? NO | (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	YES	Is This Sample Area Within a Wetland? YES
Hydric Soil Present?	YES	
Wetland Hydrology Present?	YES	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

				Secondary Indicators (minimum of two required)	
	Surface Water (A1)	X	Water-Stained Leaves (B9)		Surface Soil Cracks (B6)
X	High Water Table (A2)		Aquatic Fauna (B13)		Drainage Patterns (B10)
X	Saturation (A3)		Marl Deposits (B13)		Moss Trim Lines (B16)
	Water Marks (B1)		Hydrogen Sulfide Odor (C1)		Dry-Season Water Table (C2)
	Sediment Deposits (B2)		Oxidized Rhizospheres on Living Roots (C3)		Crayfish Burrows (C8)
	Drift Deposits (B3)		Presence of Reduced Iron (C4)		Saturation Visible on Aerial (C9)
	Algal Mat or Crust (B4)		Recent Iron Reduction in Tilled Soils (C6)		Stunted or Stressed Plants (D1)
	Iron Deposits (B5)		Thin Muck Surface (C7)		Geomorphic Position (D2)
	Inundation Visible on Aerial (B7)		Other (Explain in Remarks)		Shallow Aquitard (D3)
	Sparsely Vegetated Concave Surface (B8)				Microtopographic Relief (D4)
					FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?		Depth (inches):		
Water Table Present?	X	Depth (inches):	10	Wetland Hydrology Present? YES
Saturation Present?	X	Depth (inches):	10	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.89" in the last 5 days at Jay Peak (NOAA)

Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(in)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 4/2	100					SANDY LOAM	
10-15+	5Y 4/1	97	10YR 5/6	3	C	M	SANDY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

	Histosol (A1)		Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
	Histic Epipedon (A2)		Thin Dark Surface (S9) (LRR R, MLRA 149B)
	Black Histic (A3)		Loamy Mucky Mineral (F1) (LRR K, L)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)
	Stratified Layers (A5)	X	Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	Sandy Gleyed Matrix (S4)		
	Sandy Redox (S5)		
	Stripped Matrix (S6)		
	Dark Surface (S7) (LRR R, MLRA 149B)		

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10) (LRR K, L, MLRA 149B)
	Coast Prairie Redox (A16) (LRR K, L, R)
	5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
	Dark Surface (S9) (LRR K, L, M)
	Polyvalue Below Surface (S8) (LRR K, L)
	Thin Dark Surface (S9) (LRR K, L)
	Iron-Manganese Masses (F12) (LRR K, L, R)
	Piedmont Floodplain Soils (F19) (MLRA 149B)
	Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
	Red Parent Material (F21)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):

Hydric Soil Present? YES

Remarks:

VEGETATION - Use scientific names of plants. Sampling Point: **H11-WT6**

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (Plot size: 15'RAD)			
1. **Spiraea tomentosa**	3	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	3 = Total Cover		
Herb Stratum (Plot size: 5' RAD)			
1. **Carex comosa**	38	X	OBL
2. **Poa compressa**	38	X	FACU
3. **Eupatorium perfoliatum**	15	X	FACW
4. **Solidago gigantea**	15	X	FACW
5. **Carex scoparia**	15	X	FACW
6. **Solidago rugosa**	15	X	FAC
7. **Carex vulpinoidea**	15	X	OBL
8. **Thelypteris palustris**	15	X	FACW
9. **Symphyotrichum novae-angliae**	3		FACW
10. **Juncus effusus**	3		OBL
11. **Euthamia graminifolia**	3		FAC
12. **Carex crinita**	3		OBL
	178 = Total Cover		
Woody Vines (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test Worksheet:

Dominants OBL, FACW, FAC: **8** (A)

Dominants across all strata: **9** (B)

% Dominants OBL, FACW, FAC: **89%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply By:
OBL	**59**	x 1 = **59**
FACW	**66**	x 2 = **132**
FAC	**18**	x 3 = **54**
FACU	**38**	x 4 = **152**
UPL		x 5 =
Sum:	**181** (A)	**397** (B)

Prevalence Index = B/A = **2.19**

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is > 50%
- **X** Prevalence Index is <= 3.0
- ___ Problematic Hydrophytic Vegetation[1] (explain)
- ___ Rapid Test for Hydrophytic Vegetation
- ___ Morphological Adaptations

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **YES**

Remarks: (If observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

H16-Create

Project Site: JPR Golf Course Wetland Mitigation | City/County: Jay/Orleans | Samp. Date: 8/5/2014
Applicant/Owner: Jay Peak Resort | State: VERMONT | Sampling Point: H16-Create
Investigator(s): P. Werts-Kallfelz | Section, Township, Range: Jay
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Concave | Slope (%):
Subregion (LRR or MLRA): LRR | Lat: 44°56'32.121"N | Long: 72°30'40.583"W | Datum: NAD 83
Soil Map Unit: Cabot | NWI Class: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? YES (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? NO | Normal Circumstances? YES
Are Vegetation, Soil, or Hydrology naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	YES	Is This Sample Area Within a Wetland? YES
Hydric Soil Present?	YES	
Wetland Hydrology Present?	YES	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

	Surface Water (A1)		Water-Stained Leaves (B9)
X	High Water Table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		Marl Deposits (B13)
	Water Marks (B1)		Hydrogen Sulfide Odor (C1)
	Sediment Deposits (B2)		Oxidized Rhizospheres on Living Roots (C3)
	Drift Deposits (B3)		Presence of Reduced Iron (C4)
	Algal Mat or Crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron Deposits (B5)		Thin Muck Surface (C7)
	Inundation Visible on Aerial (B7)		Other (Explain in Remarks)
	Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (minimum of two required)

	Surface Soil Cracks (B6)
X	Drainage Patterns (B10)
	Moss Trim Lines (B16)
	Dry-Season Water Table (C2)
	Crayfish Burrows (C8)
	Saturation Visible on Aerial (C9)
	Stunted or Stressed Plants (D1)
	Geomorphic Position (D2)
	Shallow Aquitard (D3)
	Microtopographic Relief (D4)
	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?		Depth (inches):	
Water Table Present?	X	Depth (inches):	Surface
Saturation Present?	X	Depth (inches):	Surface

Wetland Hydrology Present? YES

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
1.29" in the last 5 days at Jay Peak (NOAA)

Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(in)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					SANDY LOAM	
3-10	2.5Y 4/2	98	2.5Y 5/6	2	C	M	SANDY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

	Histosol (A1)		Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
	Histic Epipedon (A2)		Thin Dark Surface (S9) (LRR R, MLRA 149B)
	Black Histic (A3)		Loamy Mucky Mineral (F1) (LRR K, L)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)
	Stratified Layers (A5)	X	Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	Sandy Gleyed Matrix (S4)		
	Sandy Redox (S5)		
	Stripped Matrix (S6)		
	Dark Surface (S7) (LRR R, MLRA 149B)		

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10) (LRR K, L, MLRA 149B)
	Coast Prairie Redox (A16) (LRR K, L, R)
	5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
	Dark Surface (S9) (LRR K, L, M)
	Polyvalue Below Surface (S8) (LRR K, L)
	Thin Dark Surface (S9) (LRR K, L)
	Iron-Manganese Masses (F12) (LRR K, L, R)
	Piedmont Floodplain Soils (F19) (MLRA 149B)
	Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
	Red Parent Material (F21)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

Restrictive Layer (if observed):
Type: Bedrock
Depth (inches): 10

Hydric Soil Present? YES

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: **H16-Create**

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Shrub Stratum (Plot size: 15'RAD)			
1. **Salix discolor**	15	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	
Herb Stratum (Plot size: 5' RAD)			
1. **Carex scoparia**	38	X	FACW
2. **Eupatorium perfoliatum**	15	X	FACW
3. **Juncus effusus**	15	X	OBL
4. **Hypericum perforatum**	15	X	UPL
5. **Carex vulpinoidea**	15	X	OBL
6. **Eutrochium maculatum**	3		OBL
7. **Impatiens capensis**	3		FACW
8. **Lycopus americanus**	3		OBL
9. **Scirpus cyperinus**	3		OBL
10. **Mimulus ringens**	3		OBL
11. **Persicaria sagittata**	1		OBL
12. **Galium palustre**	1		OBL
	115	= Total Cover	
Woody Vines (Plot size:)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Dominance Test Worksheet:

Dominants OBL, FACW, FAC: **5** (A)

Dominants across all strata: **6** (B)

% Dominants OBL, FACW, FAC: **83%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply By:
OBL	**44**	x 1 =	**44**
FACW	**71**	x 2 =	**142**
FAC		x 3 =	
FACU		x 4 =	
UPL	**15**	x 5 =	**75**
Sum:	**130** (A)		**261** (B)

Prevalence Index = B/A = **2.01**

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is > 50%
- **X** Prevalence Index is <= 3.0
- ___ Problematic Hydrophytic Vegetation[1] (explain)
- ___ Rapid Test for Hydrophytic Vegetation
- ___ Morphological Adaptations

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **YES**

Remarks: (If observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

H13-WT1/a/b

Project Site: JPR Golf Course Wetland Mitigation | City/County: Jay/Orleans | Samp. Date: 8/4/2014
Applicant/Owner: Jay Peak Resort | State: VERMONT | Sampling Point: H13-WT1/a/b
Investigator(s): P. Werts-Kallfelz | Section, Township, Range: Jay
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Concave | Slope (%):
Subregion (LRR or MLRA): LRR | Lat: 44°56'40.283"N | Long: 72°30'51.467"W | Datum: NAD 83
Soil Map Unit: Cabot | NWI Class: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? YES (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? NO | Normal Circumstances? YES
Are Vegetation, Soil, or Hydrology naturally problematic? NO | (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	YES	Is This Sample Area Within a Wetland? YES
Hydric Soil Present?	YES	
Wetland Hydrology Present?	YES	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

	Surface Water (A1)	X	Water-Stained Leaves (B9)
X	High Water Table (A2)		Aquatic Fauna (B13)
X	Saturation (A3)		Marl Deposits (B13)
	Water Marks (B1)		Hydrogen Sulfide Odor (C1)
	Sediment Deposits (B2)		Oxidized Rhizospheres on Living Roots (C3)
	Drift Deposits (B3)		Presence of Reduced Iron (C4)
	Algal Mat or Crust (B4)		Recent Iron Reduction in Tilled Soils (C6)
	Iron Deposits (B5)		Thin Muck Surface (C7)
	Inundation Visible on Aerial (B7)		Other (Explain in Remarks)
	Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (minimum of two required)

	Surface Soil Cracks (B6)
	Drainage Patterns (B10)
	Moss Trim Lines (B16)
	Dry-Season Water Table (C2)
	Crayfish Burrows (C8)
	Saturation Visible on Aerial (C9)
	Stunted or Stressed Plants (D1)
	Geomorphic Position (D2)
	Shallow Aquitard (D3)
	Microtopographic Relief (D4)
	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?		Depth (inches):		
Water Table Present?	X	Depth (inches):	10	Wetland Hydrology Present? YES
Saturation Present?	X	Depth (inches):	10	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

0.89" in the last 5 days at Jay Peak (NOAA)

Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(in)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 3/1	100					SANDY LOAM	
4-15	2.5Y 4/2	93	7.5YR 4/6	7	C	M	LOAMY SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

	Histosol (A1)		Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
	Histic Epipedon (A2)		Thin Dark Surface (S9) (LRR R, MLRA 149B)
	Black Histic (A3)		Loamy Mucky Mineral (F1) (LRR K, L)
	Hydrogen Sulfide (A4)		Loamy Gleyed Matrix (F2)
	Stratified Layers (A5)	X	Depleted Matrix (F3)
	Depleted Below Dark Surface (A11)		Redox Dark Surface (F6)
	Thick Dark Surface (A12)		Depleted Dark Surface (F7)
	Sandy Mucky Mineral (S1)		Redox Depressions (F8)
	Sandy Gleyed Matrix (S4)		
	Sandy Redox (S5)		
	Stripped Matrix (S6)		
	Dark Surface (S7) (LRR R, MLRA 149B)		

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10) (LRR K, L, MLRA 149B)
	Coast Prairie Redox (A16) (LRR K, L, R)
	5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
	Dark Surface (S9) (LRR K, L, M)
	Polyvalue Below Surface (S8) (LRR K, L)
	Thin Dark Surface (S9) (LRR K, L)
	Iron-Manganese Masses (F12) (LRR K, L, R)
	Piedmont Floodplain Soils (F19) (MLRA 149B)
	Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
	Red Parent Material (F21)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):

Hydric Soil Present? YES

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: **H13-WT1/a/b**

	Absolute % Cover	Dom. Sp?	Indicator Status
Tree Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (Plot size: **15'RAD**)			
1. **Salix nigra**	**15**	**X**	**OBL**
2.			
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
Herb Stratum (Plot size: **5' RAD**)			
1. **Carex comosa**	**38**	**X**	**OBL**
2. **Carex crinita**	**15**	**X**	**OBL**
3. **Solidago rugosa**	**15**	**X**	**FAC**
4. **Scirpus cyperinus**	**15**	**X**	**OBL**
5. **Scirpus hattorianus**	**15**	**X**	**OBL**
6. **Euthamia graminifolia**	**3**		**FAC**
7. **Lycopus americanus**	**3**		**OBL**
8. **Scirpus atrovirens**	**3**		**OBL**
9. **Mimulus ringens**	**3**		**OBL**
10. **Carex scoparia**	**3**		**FACW**
11. **Juncus effusus**	**3**		**OBL**
12. **Juncus tenuis**	**3**		**FAC**
	119 = Total Cover		
Woody Vines (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test Worksheet:

Dominants OBL, FACW, FAC: **6** (A)

Dominants across all strata: **6** (B)

% Dominants OBL, FACW, FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:			Multiply By:
OBL	**110**	x 1 =	**110**
FACW	**3**	x 2 =	**6**
FAC	**21**	x 3 =	**63**
FACU		x 4 =	
UPL		x 5 =	
Sum:	**134** (A)		**179** (B)

Prevalence Index = B/A = **1.34**

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is > 50%
- **X** Prevalence Index is <= 3.0
- ____ Problematic Hydrophytic Vegetation[1] (explain)
- ____ Rapid Test for Hydrophytic Vegetation
- ____ Morphological Adaptations

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **YES**

Remarks: (If observed, list morphological adaptations below).

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

H15-WT1

Project Site: JPR Golf Course Wetland Mitigation | City/County: Jay/Orleans | Samp. Date: 8/4/2014
Applicant/Owner: Jay Peak Resort | State: VERMONT | Sampling Point: H15-WT1
Investigator(s): P. Werts-Kallfelz | Section, Township, Range: Jay
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Concave | Slope (%):
Subregion (LRR or MLRA): LRR | Lat: 44°56'35.358"N | Long: 72°30'46.838"W | Datum: NAD 83
Soil Map Unit: Cabot | NWI Class: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? YES (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? NO | Normal Circumstances? YES
Are Vegetation, Soil, or Hydrology naturally problematic? NO | (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	YES	Is This Sample Area Within a Wetland? NO
Hydric Soil Present?	YES	
Wetland Hydrology Present?	NO	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? ___ Depth (inches): ___
Water Table Present? ___ Depth (inches): ___
Saturation Present? ___ Depth (inches): ___
Wetland Hydrology Present? NO

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.89" in the last 5 days at Jay Peak (NOAA)

Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(in)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/2	93	2.5Y 4/2	7	D	M	SANDY LOAM	
10-14	10Y 4/1	98	7.5YR 5/8	2	C	M	LOAMY SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (LRR R, MLRA 149B)
- ___ Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- ___ Thin Dark Surface (S9) (LRR R, MLRA 149B)
- ___ Loamy Mucky Mineral (F1) (LRR K, L)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- ___ Coast Prairie Redox (A16) (LRR K, L, R)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- ___ Dark Surface (S9) (LRR K, L, M)
- ___ Polyvalue Below Surface (S8) (LRR K, L)
- ___ Thin Dark Surface (S9) (LRR K, L)
- ___ Iron-Manganese Masses (F12) (LRR K, L, R)
- ___ Piedmont Floodplain Soils (F19) (MLRA 149B)
- ___ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___
Hydric Soil Present? YES

Remarks:

VEGETATION - Use scientific names of plants.

Sampling Point: **H15-WT1**

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Shrub Stratum (Plot size: 15'RAD)			
1. **Cornus alba**	15	X	FACW
2. **Salix bebbiana**	15	X	FACW
3. **Acer rubrum**	3		FAC
4. **Betula alleghaniensis**	3		FAC
5.			
6.			
7.			
	36	= Total Cover	
Herb Stratum (Plot size: 5' RAD)			
1. **Carex crinita**	38	X	OBL
2. **Carex comosa**	15	X	OBL
3. **Solidago gigantea**	15	X	FACW
4. **Verbena hastata**	3		FACW
5. **Euthamia graminifolia**	3		FAC
6. **Eupatorium perfoliatum**	3		FACW
7. **Anaphalis DC**	3		FACU
8. **Onoclea sensibilis**	1		FACW
9. **Thalictrum L.**	1		NI
10. **Symphyotrichum novae-angliae**	1		FACW
11. **Asclepias incarnata**	1		OBL
12.			
	84	= Total Cover	
Woody Vines (Plot size:)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Dominance Test Worksheet:

Dominants OBL, FACW, FAC: **5** (A)

Dominants across all strata: **5** (B)

% Dominants OBL, FACW, FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply By:
OBL	**54**	x 1 = **54**
FACW	**53**	x 2 = **106**
FAC	**9**	x 3 = **27**
FACU	**3**	x 4 = **12**
UPL		x 5 =
Sum:	**119** (A)	**199** (B)

Prevalence Index = B/A = **1.67**

Hydrophytic Vegetation Indicators:

- **X** Dominance Test is > 50%
- **X** Prevalence Index is <= 3.0
- ___ Problematic Hydrophytic Vegetation[1] (explain)
- ___ Rapid Test for Hydrophytic Vegetation
- ___ Morphological Adaptations

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).

Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.

Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.

Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.

Woody vine - All woody vines, regardless of height.

Hydrophytic Vegetation Present? **YES**

Remarks: (If observed, list morphological adaptations below).

Photograph 1: H5-TB3 from Station H5-TB3-P1, facing east (P. Werts, 8/5/14)

Photograph 2: H5-TB1 from Station H5-TB1-P1, facing south (P. Werts, 8/5/2014)

Photograph 3: H5-Create from Station H5-Create-P1, facing northeast (P. Werts, 8/5/2014)

Photograph 4: H6-WT1, from Station H6-WT1-P1, facing southeast (P. Werts, 8/5/14)

Photograph 5: H6-WT1, from Station H6-WT1-P2, facing east (P. Werts, 8/5/14)

Photograph 6: H6-TB1 from Station H6-TB1-P1, facing south (P. Werts, 8/5/14)

Photograph 7: H6-TB1 from Station H6-TB1-P2, facing northwest (P. Werts, 8/5/14)

Photograph 8: WH-WT1 from Station WH-WT1-P1, facing northeast (P. Werts, 8/5/14)

Photograph 9: WH-WT2 from Station WH-WT2-P1, facing southwest (P. Werts, 8/5/14)

Photograph 10: H7-SC1 from Station H7-SC1-P1, facing southeast (P. Werts, 8/5/14)

Photograph 11: H4-WT1/2 from Station H4-WT1-P1, facing southeast (P. Werts, 8/5/14)

Photograph 12: H4-WT3 from Station H4-WT3-P1, facing east (P. Werts, 8/5/14)

Photograph 13: H8-SC3 from Station H8-SC3-P1, facing east (P. Werts, 8/4/14)

Photograph 14: H8-SC1 from Station H8-SC1-P1, facing northeast (P. Werts, 8/4/14)

Photograph 15: H8-Create from Station H8-Create-P1, facing northeast (P. Werts, 8/4/14)

Photograph 16: H1-WT1 from Station H1-WT1-P1, facing north (P. Werts, 8/4/14)

Photograph 17: P2-TB1 looking upstream from Station P2-TB1-P1, facing southwest (P. Werts, 8/4/14)

Photograph 18: P2-TB1 looking downstream from Station P2-TB1-P1, facing northeast (P. Werts, 8/4/14)

Photograph 19: P2-TB1 looking upstream from Station P2-TB1-P2, facing southwest (P. Werts, 8/5/14)

Photograph 20: P2-TB1 looking upstream from Station P2-TB1-P3, facing southwest (P. Werts, 8/5/14)

Photograph 21: H11-WT2/3 from Station H11-WT2/3-P1, facing southwest (P. Werts, 8/4/14)

Photograph 22: H11-TB1 from Station H11-TB1-P1, facing northwest (P. Werts, 8/4/14)

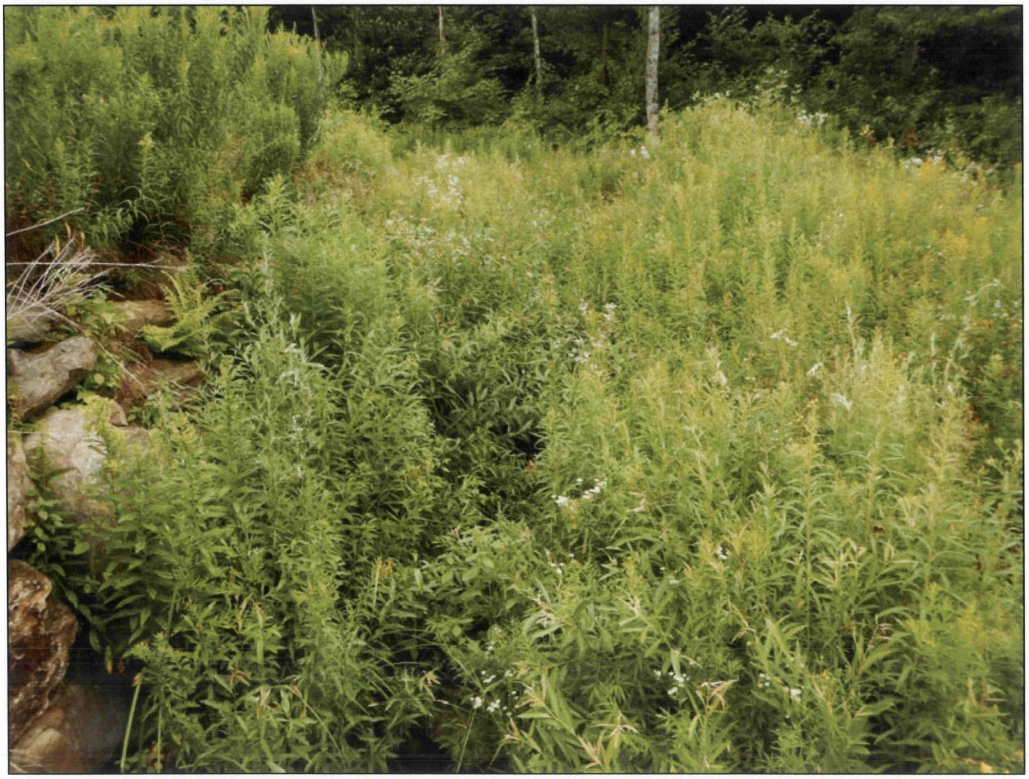
Photograph 23: H11-Create from Station H11-Create-P1, facing northwest (P. Werts, 8/4/14)

Photograph 24: H11-Create from Station H11-Create-P2, facing southeast (P. Werts, 8/4/14)

Photograph 25: H11-TB2 from Station H11-TB2-P1 facing north (P. Werts, 8/4/14)

Photograph 26: H11-WT6 from Station H11-WT6-P1, facing northeast (P. Werts, 8/4/14)

Photograph 27: H12-TB1u from Station H12-TB1u-P1, facing south (P. Werts, 8/4/14)



Photograph 28: H13-TB1u from Station H13-TB1u-P1, facing north (P. Werts, 8/4/14)

Photograph 29: H13-TB2 from Station H13-TB2-P1, facing south (P. Werts, 8/4/14)

Photograph 30: H13-SC/TB3 from Station H13-SC/TB3-P1, facing north (P. Werts, 8/4/14)

Photograph 31: H13-WT1/a/b from Station H13-WT1/a/b-P1, facing north (P. Werts, 8/4/14)

Photograph 32: H13-WT2-from Station H13-WT2-P1, facing west (P. Werts, 8/4/14)

Photograph 33: H13-WT3 from Station H13-WT3-P1, facing southwest (P. Werts, 8/4/14)

Photograph 34: H14-WT1u from Station H14-WT1u-P1, facing southeast (P. Werts, 8/4/14)

Photograph 35: H14-SC1 from Station H14-SC1-P1, facing northwest (P. Werts, 8/4/14)

Photograph 36: H14-WT2/3 from Station H14-WT2/3-P1, facing west (P. Werts, 8/4/14)

Photograph 37: H14-WT1d from Station H14-WT1d-P1, facing southeast (P. Werts, 8/4/14)

Photograph 38: H15-TB1 from Station H15-TB1-P1, facing south (P. Werts, 8/4/14)

Photograph 39: H15-WT1 from Station H15-WT1-P1, facing south (P. Werts, 8/4/14)

Photograph 40: H13-TB1d from Station H15-TB1d-P1, facing north (P. Werts, 8/4/14)

Photograph 41: H12-TB1d from Station H12-TB1d-P1, facing south (P. Werts, 8/4/14)

Photograph 42: H16-Create from Station H16-Create-P1, facing southwest (P. Werts, 8/4/14)

Photograph 43: H16-Create from Station H16-Create-P2, facing northwest (P. Werts, 8/4/14)

Photograph 44: H16-SC1 from Station H16-SC1-P1, facing northwest (P. Werts, 8/4/14)

APPENDIX E

MITIGATION REPORT
TRANSMITTAL AND SELF-CERTIFICATION

DEPARTMENT OF THE ARMY PERMIT NUMBER: NAE-2008-1314
PROJECT TITLE: Jay Peak Resort Golf Course

PERMITTEE:
MAILING ADDRESS: 4850 VT Route 242
Jay, VT 05859

TELEPHONE: 802-988-2726

AUTHORIZED AGENT: Vanasse Hangen Brustlin, Inc.
MAILING ADDRESS: 40 IDX Drive, Building 100, Suite 200
South Burlington, VT 05403

TELEPHONE: 802-497-6100

ATTACHED MITIGATION REPORT TITLE: Jay Peak Resort Golf Course Mitigation - Fourth Annual (2014) Mitigation Monitoring Report

PREPARERS: Vanasse Hangen Brustlin, Inc.

DATE: January 27, 2015

CERTIFICATION OF COMPLIANCE: I certify that the attached report is accurate and discloses that the mitigation required by the Department of the Army Permit **[is]** **[is not]** in full compliance with the terms and conditions of that permit.

CORRECTIVE ACTION: A need for corrective action **[is]** **[is not]** identified in the attached report.

CONSULTATION: I **[do]** **[do not]** request consultation with the Corps of Engineers to discuss a corrective strategy or permit modification.

CERTIFIED: _____ Jan. 26, 2015
(Signature of permittee) Date