

Semi-Annual Wetland Mitigation Area Status Report July 2003

Blenheim Gilboa Slide Area Remediation Project
Blenheim, New York

U.S. Army Corps of Engineers Permit No. 1998-0950

Prepared For:
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Respectfully Submitted To:
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Supervision and Compliance Section
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July 28, 2003

Semi-Annual Wetland Mitigation Area Status Report, July 2003
Blenheim-Gilboa Slide Area Remediation Project
Blenheim, New York

EXECUTIVE SUMMARY

The New York Power Authority (NYPA) Blenheim-Gilboa (B-G) Project includes a lower reservoir on Schoharie Creek and an upper reservoir on Brown Mountain. The two reservoirs are separated by a fairly steep west-facing hillside that rises from an elevation of approximately 900 feet above sea level, to an elevation of approximately 1,900 feet above sea level. In recent years, the NYPA has documented evidence of significant earth movement (i.e. slumping) on portions of the hillside between the upper and lower reservoirs. This slumping is threatening the integrity of transmission lines and other project-related facilities in this area. To address this problem, NYPA has completed a remediation project to stabilize the hillside. A portion of this project includes a redirection and removal of sources of surface water.

In September 2000, the U.S. Army Corps of Engineers (Corps) issued a final permit (No. 1998-0950) for the remediation of the B-G Slide Area, which authorizes NYPA to:

- Discharge approximately 220,000 cubic yards of fill into approximately 8.0 acres of the Lower Reservoir of the Schoharie Creek below the ordinary high water mark to construct a berm; and
- Discharge fill material into 5.30 acres of Waters of the U.S. to facilitate the redirection of surface water on the existing slope, and to excavate approximately 0.16 acres of Waters of the U.S. located at the borrow area to provide fill for the berm's construction.

The permit was exercised during the 2000-2001 construction season. Special Condition (C) of the Corps Permit requires that the NYPA shall construct compensatory mitigation areas through the creation of at least 6.19 acres of freshwater wetlands, the majority of which shall become 5.24 acres of shrub-scrub wetland cover type. Furthermore, Special Condition (G) of the subject permit, requires the completion of semiannual reports on the status of the mitigation activities, to monitor the success rate of the conversion of the mitigation areas from upland to freshwater wetlands.

The following report provides the first semiannual report during 'Year Three' on the status of the four compensatory mitigation areas created during the 2001 construction season. As required by the permit conditions, the report provides a status of the mitigation area's dominant plant species and hydrologic information and is supplemented by photographic documentation, a survey of the mitigation areas with contour intervals, data sheets summarizing the data collection efforts for the monitoring period, and a remedial plan to address steps proposed to improve success of the mitigation areas, where necessary.

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Mitigation Area A1

General Description: Mitigation Area A1 is an isolated area immediately east of the wetland identified as Wetland A in the delineation performed by Environmental Design & Research, P.C. (EDR) in the spring of 1999. See Figure 1. Mitigation Area A1 was designed to develop into a 1.03 acres wetland with a finished low elevation of 808' above sea level. The area was planted with Northeast Wetland Forest/Herb Mix at a rate of 3 lbs./acre (supplemented by *Verbena hastata*, *Scirpus atrovirens*, and *Glyceria grandis* each at a rate of 0.5 lbs/acre) in addition to individual shrub plantings, to create a scrub-shrub wetland. In 2001, Mitigation Area A1 was excavated, lined with a bentonite clay liner, surfaced with topsoil, fine graded, seeded and mulched (straw). Additionally, two groundwater-monitoring wells were installed in the mitigation area. Construction, including seeding and mulching was completed by September 21, 2001. Individual shrub plantings, consisting of speckled alder (*Alnus rugosa*), willows (*Salix* sp.), and cranberry viburnum (*Viburnum trifolium*), were planted during April 2002.

Data Collection: Semiannual data was collected from Mitigation Area A1 by EDR Staff Ecologist Bill Trembath on June 25, 2003. Percent coverage of dominant plant species, hydrologic data, and soils data were collected in two sample points. One data point was taken near the location of the north well (SP-A1-1). Soils in the top 1-inch of the profile were dark brown (10YR 3/2), grayish-brown (10YR 5/2) from 1 inch to the liner, and did not yet exhibit hydric soils characteristics. One data point was taken near the location of the south well (SP-A1-2). Soils in the top 2 inches were dark brown (10YR 3/1), grayish-brown (10YR 5/2) from 2 inches to the liner, and did not yet exhibit hydric soils characteristics. The average soil depth to the bentonite clay liner at both sample locations was 12", and therefore only the upper 12" of soil was inspected. A summary of the data collected for SP-A1-1 and SP-A1-2 is reported in the attached data collection sheets.

Photographic documentation: Photographic documentation was performed in each mitigation area during the site investigation on June 25, 2003. Representative photographs of Mitigation Area A1 are attached.

Dominant plant species: Refer to the attached data sheets labeled for SP-A1-1 and SP-A1-2. One data point was taken near the location of the north well (SP-A1-1) and one near the south well (SP-A1-2). At both data points, the areas were dominated by rice cutgrass (*Leeria oryzoides*), water plantain (*Alisma plantago-aquatica*), thin-leaf cattails (*Typha angustifolia*), and soft rush (*Juncus effusus*). However this is not typical of the entire mitigation area. The overall wetland is primarily dominated by cattails but shrub species (particularly *Alnus rugosa*) planted in April 2002 are becoming well established. Other species noted include sedges (*Carex* sp.), blue vervain (*Verbena hastata*), and green bulrush (*Scirpus atrovirens*). No evidence of invasion by common reed (*Phragmites australis*), or purple loosestrife (*Lythrum salicaria*) was found.

Groundwater Monitoring Well Data: Groundwater data was not collected directly from the existing wells, since they were not in a vertical position due to heaving caused by environmental stresses (i.e. frost heaving, wind, etc.). Therefore, visual indicators of hydrology were noted. The ground surface is inundated in pockets up to 3-4" in the area of SP-A1-1, and from 1-2" in the area of well point SP-A1-2. In most areas throughout the wetland, the upper 12" of soil are saturated. While this mitigation area appears dryer than the other 3 mitigation areas, it appears to have the most seasonally appropriate hydrology. The outlet at the north end of the area

appears to be functioning properly, as well. Two new monitoring wells were installed (6/25/03) to replace the heaved wells.

Remedial Plan: A post-construction survey performed by Sear Brown Associates on September 21, 2001 indicated the desired elevation of 808' was generally achieved throughout Mitigation Area A1. However, in most locations around the edge of the designed area, the 808' contour was well within the edge of the work area, which suggested a smaller acreage of wetland, would develop than designed. Additionally some areas at the north end of the mitigation area were higher than designed by as much as 12." It was estimated based solely upon as-built contours that the area anticipated to develop into wetland was between 0.75 and 0.94 acres. Remedial efforts were undertaken in the fall of 2001 including spot corrections to grades, to increase the size of the area anticipated to develop into wetland. Approximately one acre of wetland has developed and the present pattern of hydrology supports a preponderance of wetland vegetation within the 808' contour. Emergent wetland vegetation has become firmly established.

An assessment of shrub survival was performed in May 2003. A total of 1,250 shrubs were planted in Area A1. A sample plot of approximately 10% of Area 1 was established for determining shrub survival rates. Approximately 81% shrub survival was documented in Area 1 at the time of sampling. The results may be reviewed with the planting contractor. Additional shrub plantings may be needed in those areas that are notably lacking shrub survival.

DATA FORM
 ROUTINE WETLAND DETERMINATION
 1987 COE Wetlands Delineation Manual

Project No: 900 Applicant: NYPA - B-G Date: 6/25/03
 Investigator: Trembath County: Schoharie State: NY
 Community: EME
 Transect/Flag ID: Mitigation Area A-1
 Plot ID: SP-A1-T

Do normal circumstances exist on site? Yes No
 Is the site significantly disturbed? Yes No
 Is the area a potential Problem Area? Yes No

SOILS

Series and Phase: _____ Drainage Class: WD MWD SPD PD VPD
 Subgroup: _____ Confirm Mapped Type: Yes No

Depth	Horizon	Matrix color	Mottle color/abundance	Texture, Structure, Other
<u>0-1</u>	<u>A</u>	<u>10YR3/2</u>	<u>None</u>	<u>organic, Silt loam</u>
<u>1-10+</u>	<u>B</u>	<u>10YR5/2</u>	<u>None</u>	<u>Clay</u>

Hydric Soil Indicators:
 Histisols Concretions Listed on Local Hydric Soils List
 Histic Epipedon High Org. Content in Surface Layer of Sandy Soils Listed as Potential for Hydric Inclusions Only
 Sulfidic Odor Organic Streaking in Sandy Soils Other (Explain in Remarks)
 Reducing Conditions Gleyed or Low Chroma color Aquic Moisture Regime

Landscape position: concave _____ convex _____ sloping _____ Approximate slope: _____
 flat undulating _____

Remarks: Clay liner at ~ 10" depth

HYDROLOGY

Recorded Data (Describe in Remarks)
 _____ No Recorded Data Available
 _____ Stream, Lake or Tide Gauge
 _____ Aerial Photographs

Field Observations
 Ground Surface Inundated 3-4 inches.
 Soil Saturated.
 Depth to Free Water 0 inches.
 Depth to Saturated Soils 0 inches.

Wetland Hydrology Indicators:

Primary Indicators
 Inundated
 Saturated in upper 12 inches.
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetland

Secondary Indicators (2 or more required)
 Oxidized Root Channels in upper 12 inches
 Water-Stained leaves
 Local Soil Survey
 Morphological Plant Adaptations
 Other (Explain in Remarks)

Remarks:

Project Number: 900
 Applicant: NYPA - B-G

Date: 6/25/03
 Plot ID Number: SP-A1-1

VEGETATION

Dominant Plant Species:	Stratum: (circle one)	Indicator:	% Cover:
1 <u>Rice cut grass</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>50</u>
2 <u>Water plantain</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>25</u>
3 <u>Thin-leaf cattail</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>15</u>
4 <u>Soft Rush</u>	<input checked="" type="radio"/> H S/S T V	<u>FACW+</u>	<u>10</u>
5 <u>Spike Rush</u>	<input checked="" type="radio"/> H S/S T V	<u>NL</u>	<u>< 5</u>
6 _____	H S/S T V	_____	_____
7 _____	H S/S T V	_____	_____
8 _____	H S/S T V	_____	_____
9 _____	H S/S T V	_____	_____
10 _____	H S/S T V	_____	_____
11 _____	H S/S T V	_____	_____
12 _____	H S/S T V	_____	_____
13 _____	H S/S T V	_____	_____
14 _____	H S/S T V	_____	_____
15 _____	H S/S T V	_____	_____
16 _____	H S/S T V	_____	_____

Percent of Dominant Species OBL, FACW, FAC 100 Percent of Dominant Species OBL, FACW 100

50/20 Rule Applied? Yes No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes or No

Hydric Soils Present? Yes or No

Wetland Hydrology Present? Yes or No

Is this Sampling Point Within a Wetland? Yes or No

Remarks:

Photo Reference Number:

SP-A1-1 taken adjacent to southern water level well.

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DATA FORM
 ROUTINE WETLAND DETERMINATION
 1987 COE Wetlands Delineation Manual

Project No: 900 Applicant: NYPA - B-G Date: 6/25/03
 Investigator: Trembath County: Schoharie
 State: NY
 Do normal circumstances exist on site? Yes No Community: EME
 Is the site significantly disturbed? Yes No Transect/Flag ID: Mitigation Area A-1
 Is the area a potential Problem Area? Yes No Plot ID: SP-A1-2

SOILS

Series and Phase: _____ Drainage Class: WD MWD SPD PD VPD
 Subgroup: _____ Confirm Mapped Type: Yes No

Depth	Horizon	Matrix color	Mottle color/abundance	Texture, Structure, Other
<u>0-2</u>	<u>A</u>	<u>10YR 3/1</u>	<u>NONE</u>	<u>Silt loam, Organic</u>
<u>2-10</u>	<u>B</u>	<u>10YR 5/2</u>	<u>NONE</u>	<u>Clay</u>

Hydric Soil Indicators:

- Histisols Concretions Listed on Local Hydric Soils List
- Histic Epipedon High Org. Content in Surface Layer of Sandy Soils Listed as Potential for Hydric Inclusions Only
- Sulfidic Odor Organic Streaking in Sandy Soils Other (Explain in Remarks)
- Reducing Conditions Gleyed or Low Chroma color Aquic Moisture Regime

Landscape position: concave _____ convex _____ sloping _____ Approximate slope: _____
 flat undulating _____

Remarks:

HYDROLOGY

<p>Recorded Data (Describe in Remarks)</p> <p><input type="checkbox"/> No Recorded Data Available</p> <p><input type="checkbox"/> Stream, Lake or Tide Gauge</p> <p><input type="checkbox"/> Aerial Photographs</p>	<p>Field Observations</p> <p><input checked="" type="checkbox"/> Ground Surface Inundated <u>1-2</u> inches.</p> <p><input checked="" type="checkbox"/> Soil Saturated.</p> <p>Depth to Free Water <u>0</u> inches.</p> <p>Depth to Saturated Soils <u>0</u> inches.</p>
<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in upper 12 inches.</p> <p><input checked="" type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input type="checkbox"/> Drainage Patterns in Wetland</p>	<p>Secondary Indicators (2 or more required)</p> <p><input type="checkbox"/> Oxidized Root Channels in upper 12 inches</p> <p><input checked="" type="checkbox"/> Water-Stained leaves</p> <p><input type="checkbox"/> Local Soil Survey</p> <p><input type="checkbox"/> Morphological Plant Adaptations</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>

Remarks:

Project Number: 900
 Applicant: NYPA - B-G

Date: 6/25/03
 Plot ID Number: SP-A1-2

VEGETATION

Dominant Plant Species:	Stratum: (circle one)	Indicator:	% Cover:
1 <u>Thin leaf cattail</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>50</u>
2 <u>Rice Cut Grass</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>30</u>
3 <u>Blue vervain</u>	<input checked="" type="radio"/> H S/S T V	<u>FACW+</u>	<u>10</u>
4 <u>Purple loosestrife</u>	<input checked="" type="radio"/> H S/S T V	<u>FACW+</u>	<u>10</u>
5 _____	H S/S T V	_____	_____
6 _____	H S/S T V	_____	_____
7 _____	H S/S T V	_____	_____
8 _____	H S/S T V	_____	_____
9 _____	H S/S T V	_____	_____
10 _____	H S/S T V	_____	_____
11 _____	H S/S T V	_____	_____
12 _____	H S/S T V	_____	_____
13 _____	H S/S T V	_____	_____
14 _____	H S/S T V	_____	_____
15 _____	H S/S T V	_____	_____
16 _____	H S/S T V	_____	_____

Percent of Dominant Species OBL, FACW, FAC 100 Percent of Dominant Species OBL, FACW 100

50/20 Rule Applied? Yes No

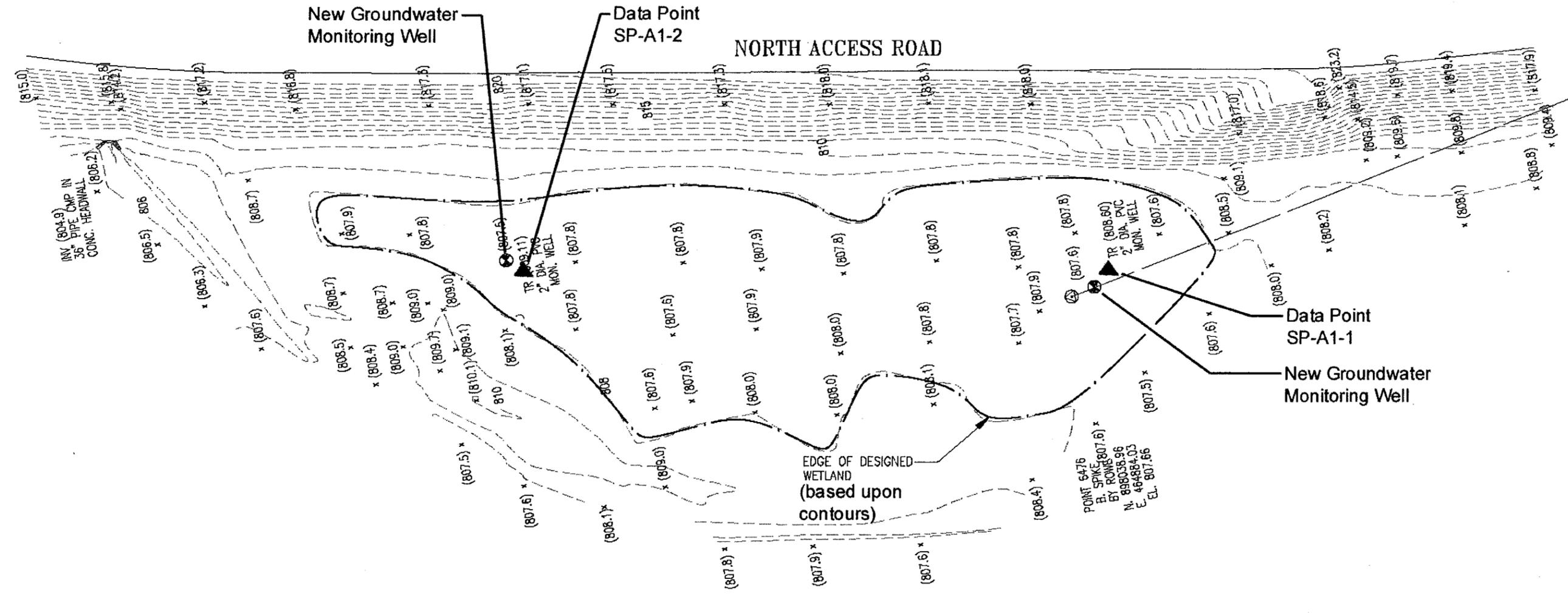
Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes or No Hydric Soils Present? Yes or No
 Wetland Hydrology Present? Yes or No Is this Sampling Point Within a Wetland? Yes or No

Remarks: Photo Reference Number:

SP-A1-2 taken adjacent to northern monitoring well. 14



SURVEY NOTES
 1. TOPOGRAPHIC INFORMATION FROM INSTRUMENT SURVEY COMPLETED BY SEAR-BROWN ON SEPTEMBER 19, 2001.
 2. HORIZONTAL AND VERTICAL DATUM SHOWN HEREON IS REFERENCED TO MAPPING PREPARED BY ROWE, WOODIN, PARSONS & BROVETTO ASSOCIATES AS PROVIDED BY THE NEW YORK STATE POWER AUTHORITY .

 north
SCALE: 1"=50'

AS-BUILT SURVEY
MITIGATION AREA A1
BLenheim-GILBOA PUMPED STORAGE POWER PROJECT
SCHOHARIE COUNTY, NEW YORK
FIGURE 1, SHEET 1

Blenheim Gilboa Slide Area Remediation Project
Wetland Mitigation Area Status Report, July 2003



Photo 1. Mitigation Area A1 with groundwater monitoring well.



Photo 2. Mitigation Area A1 southwest view, at sample point SP-A1-2.

Prepared By:



Mitigation Area A1

Semi-Annual Wetland Mitigation Area Status Report, July 2003
Blenheim Gilboa Slide Area Remediation Project
Blenheim, New York
Continued

Mitigation Area A2

General description: Mitigation Area A2 is also an isolated area immediately east of the existing wetland identified by EDR as Wetland A, located south of Mitigation Area A1 along the North Access Road (see Figure 2). Mitigation Area A2, as proposed was designed to develop a 0.90 acres wetland with a finished low elevation of 811' above sea level. The area was planted with Northeast Wetland Forest/Herb Mix at a rate of 3 lbs./acre (supplemented by *Verbena hastata*, *Scirpus atrovirens*, and *Glyceria grandis* each at a rate of 0.5 lbs./acre) in addition to individual shrub plantings, to create a scrub-shrub wetland. Mitigation Area A2 was excavated, lined with a bentonite clay liner, surfaced with topsoil, fine graded, seeded and mulched (straw) in summer 2001. Additionally, two groundwater monitoring wells were installed in the mitigation area. Construction, including seeding and mulching, was completed by September 21, 2001. Individual shrub plantings were placed in April 2002. In June 2002, remedial efforts were undertaken in the mitigation area, which included the addition of a 0.22-acre basin to the area constructed in 2001 to increase the size of the mitigation area.

Data Collection: Semiannual data was collected from Mitigation Area A2 by EDR Staff Ecologist Bill Trembath on June 25, 2003. Percent coverage of dominant plant species, hydrologic data, and soils data were collected in two sample points. Soils were grayish brown (10YR 5/2) and have begun to exhibit hydric soils characteristics. Average soils depth to the bentonite clay liner is 12", and therefore only the upper 12" of soil were inspected. A summary of the data collected is reported in the attached data collection sheets labeled "Mitigation Area A2".

Photographic documentation: Photographic documentation was performed in each mitigation area during the site investigation on June 25, 2003. Representative photographs of Wetland A2 are attached.

Dominant plant species: Refer to the attached data collection sheets labeled "Mitigation Area A2" (Plot Id's A2-1 and A2-2). Two data points were taken in the location of the monitoring wells. Generally, Mitigation Area A2 is inundated at the surface and vegetated with herbaceous species including blue vervain, smartweed, spike rush (*Eleocharis* sp.), cattails and sedges. In the area of A2-1, adjacent to the south well, vegetation is primarily dominated by cattails, spike rush, soft rush (*Juncus effusus*) and rice cutgrass. Vegetative coverage in the area is approximately 30%, and open water dominates the southern finger of the mitigation area. In the area of data plot A2-2 (north well), vegetative cover is dense, and dominated by rice cut grass, thin-leaf cattails and fowl meadowgrass (*Poa palustris*). No successful establishment of shrubs has occurred in either sample plot location, although a few surviving alders were noted. No evidence of invasion by common reed or purple loosestrife was found.

Groundwater Monitoring Well Data: Groundwater data was not collected from the installed wells since they were not in a vertical position due to heaving caused by environmental stresses (i.e. frost heaving, wind, etc.). Surface water conditions were inspected during the June 25, 2003 site visit. In the data plot located adjacent to the south well (SP-A2-1), the ground surface was inundated up to 1-2" in pockets. The open water area at the southern end of the mitigation area (remediated area) is inundated to approximately 4 to 6 inches. Given the recent above average precipitation, inundation in this area may still be too excessive for optimal wetland shrub growth.

Remedial Plan: A post-construction survey performed by Sear Brown Associates on September 21, 2001, indicated that the desired elevation of 811' was generally achieved throughout Mitigation Area A2. As with Mitigation Area A1, the basin was designed to hold the 811' contour to the edge of the mitigation area, then rise abruptly rather than having a gradually sloping edge. The post-construction survey shows the 811' contour enclosed a smaller area than designed, suggesting a smaller acreage of wetland would develop than desired. Additionally, the contractor installed a supplemental basin at the south end of the main basin that was not originally designed. While the elevations in the center of the supplemental basin indicate a wetland would develop, it was not hydrologically connected to the main basin of A2. Based upon recommendations made following the November 2001 Status Report, the contractor added a 0.22-acre area, which includes the isolated supplemental basin, at the south end of the main mitigation area. The grading and stabilization of this area was completed in June 2002. In September 2002, Sear Brown Associates re-surveyed the mitigation area. The as-builts indicate that the 811' contour, the designed wetland edge, encloses an area of approximately 1.02 acres (see Figure 2). Emergent wetland vegetation has become firmly established and the pattern of hydrology supports the full development of the designed wetland.

A trench was excavated at the west end of the mitigation area to alleviate excessive inundation, as previously recommended. Water level in the area is higher than during the November 2002 site evaluation. However, this may be a function of recent above average precipitation and the effectiveness of the trench should be reviewed weekly throughout the 2003 growing season (May – September). Two new monitoring wells were installed adjacent to the existing monitoring wells in Mitigation Area A2 on June 26, 2003.

An assessment of shrub survival was performed in May 2003. A total of 650 shrubs were planted in April 2002. Based upon a sample transects covering more than 11% of the mitigation area, it appears that the shrub survival rate is approximately 63%. The results may be reviewed with the planting contractor. Additional shrub plantings may be needed in those areas that are notably lacking shrub survival.

DATA FORM
ROUTINE WETLAND DETERMINATION
 1987 COE Wetlands Delineation Manual

Project No: 900 Applicant: NYPA - B-G Date: 6/25/03
 Investigator: Trembath Town: Blenheim
 County: Schoharie
 State: NY

Do normal circumstances exist on site? Yes No Community: EME
 Is the site significantly disturbed? Yes No Transect/Flag ID: Mitigation Area A2
 Is the area a potential Problem Area? Yes No Plot ID: SP-A2-1

SOILS

Series and Phase: _____ Drainage Class: WD MWD SPD PD VPD
 Subgroup: _____ Confirm Mapped Type: Yes No

Depth	Horizon	Matrix color	Mottle color/abundance	Texture, Structure, Other
<u>0-10</u>	<u>A</u>	<u>10YR 5/2</u>	<u>10YR 5/6, Few</u>	<u>Clay</u>

Hydric Soil Indicators:
 Histisols Concretions Listed on Local Hydric Soils List
 Histic Epipedon High Org. Content in Surface Layer of Sandy Soils Listed as Potential for Hydric Inclusions Only
 Sulfidic Odor Organic Streaking in Sandy Soils Other (Explain in Remarks)
 Reducing Conditions Gleyed or Low Chroma color Aquic Moisture Regime

Landscape position: concave _____ convex _____ sloping _____ Approximate slope: _____
 flat undulating _____

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks)
 No Recorded Data Available
 Stream, Lake or Tide Gauge
 Aerial Photographs

Field Observations
 Ground Surface Inundated 1-2 inches.
 Soil Saturated.
 Depth to Free Water 0 inches.
 Depth to Saturated Soils 0 inches.

Wetland Hydrology Indicators:
 Primary Indicators
 Inundated
 Saturated in upper 12 inches.
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetland

Secondary Indicators (2 or more required)
 Oxidized Root Channels in upper 12 inches
 Water-Stained leaves
 Local Soil Survey
 Morphological Plant Adaptations
 Other (Explain in Remarks)

Remarks:

Project Number: 900
 Applicant: NYPA - B-G

Date: 6/25/03
 Plot ID Number: SP-A2-1

VEGETATION

Dominant Plant Species:	Stratum: (circle one)	Indicator:	% Cover:
1 <u>Rice cut grass</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>50</u>
2 <u>Thin leaf cattail</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>30</u>
3 <u>Soft Rush</u>	<input checked="" type="radio"/> H S/S T V	<u>FACW+</u>	<u>5</u>
4 <u>Water Plantain</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>10</u>
5 <u>Spike Rush</u>	<input checked="" type="radio"/> H S/S T V	<u>NL</u>	<u>5</u>
6 _____	H S/S T V	_____	_____
7 _____	H S/S T V	_____	_____
8 _____	H S/S T V	_____	_____
9 _____	H S/S T V	_____	_____
10 _____	H S/S T V	_____	_____
11 _____	H S/S T V	_____	_____
12 _____	H S/S T V	_____	_____
13 _____	H S/S T V	_____	_____
14 _____	H S/S T V	_____	_____
15 _____	H S/S T V	_____	_____
16 _____	H S/S T V	_____	_____

Percent of Dominant Species OBL, FACW, FAC 95 Percent of Dominant Species OBL, FACW 95
 50/20 Rule Applied? Yes No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes or No Hydric Soils Present? Yes or No
 Wetland Hydrology Present? Yes or No Is this Sampling Point Within a Wetland? Yes or No

Remarks:

Photo Reference Number:

SP-A2-1 taken adjacent to monitoring well at south end of mitigation area. 3

DATA FORM
ROUTINE WETLAND DETERMINATION
 1987 COE Wetlands Delineation Manual

Project No: 900 Applicant: NYPA - B-G Date: 6/25/03
 Investigator: Trembath Town: Blenheim
 County: Schoharie State: NY
 Do normal circumstances exist on site? Yes No Community: EME
 Is the site significantly disturbed? Yes No Transect/Flag ID: Mitigation Area Az
 Is the area a potential Problem Area? Yes No Plot ID: SP-AZ-2

SOILS

Series and Phase: _____ Drainage Class: **WD MWD SPD PD VPD**

Subgroup: _____ Confirm Mapped Type: **Yes No**

Depth	Horizon	Matrix color	Mottle color/abundance	Texture, Structure, Other
0-10	A	10YR 5/2	10YR 5/6, Few	Clay

Hydric Soil Indicators:

- | | | |
|---|--|---|
| <input type="checkbox"/> Histisols | <input type="checkbox"/> Concretions | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Org. Content in Surface Layer of Sandy Soils | <input type="checkbox"/> Listed as Potential for Hydric Inclusions Only |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Gleyed or Low Chroma color | <input type="checkbox"/> Aquic Moisture Regime |

Landscape position: concave _____ convex _____ sloping _____ Approximate slope: _____
 flat undulating _____

Remarks:

HYDROLOGY

- Recorded Data (Describe in Remarks) _____
 No Recorded Data Available _____
 Stream, Lake or Tide Gauge _____
 Aerial Photographs _____

Field Observations
 Ground Surface Inundated 3-5 inches.
 Soil Saturated.

Depth to Free Water 0 inches.
 Depth to Saturated Soils 0 inches.

Wetland Hydrology Indicators:

Primary Indicators

- Inundated
 Saturated in upper 12 inches.
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetland

Secondary Indicators (2 or more required)

- Oxidized Root Channels in upper 12 inches
 Water-Stained leaves
 Local Soil Survey
 Morphological Plant Adaptations
 Other (Explain in Remarks)

Remarks:

Project Number: 900
 Applicant: NYPA - B-G

Date: 6/25/03
 Plot ID Number: SP-A2-2

VEGETATION

Dominant Plant Species:	Stratum: (circle one)	Indicator:	% Cover:
1 <u>Rice Cut Grass</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>50</u>
2 <u>Fowl Meadowgrass</u>	<input checked="" type="radio"/> H S/S T V	<u>FACW</u>	<u>20</u>
3 <u>Thin leaf Cattail</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>30</u>
4 _____	H S/S T V	_____	_____
5 _____	H S/S T V	_____	_____
6 _____	H S/S T V	_____	_____
7 _____	H S/S T V	_____	_____
8 _____	H S/S T V	_____	_____
9 _____	H S/S T V	_____	_____
10 _____	H S/S T V	_____	_____
11 _____	H S/S T V	_____	_____
12 _____	H S/S T V	_____	_____
13 _____	H S/S T V	_____	_____
14 _____	H S/S T V	_____	_____
15 _____	H S/S T V	_____	_____
16 _____	H S/S T V	_____	_____

Percent of Dominant Species OBL, FACW, FAC 100 Percent of Dominant Species OBL, FACW 100
 50/20 Rule Applied? Yes No

Remarks:

WETLAND DETERMINATION

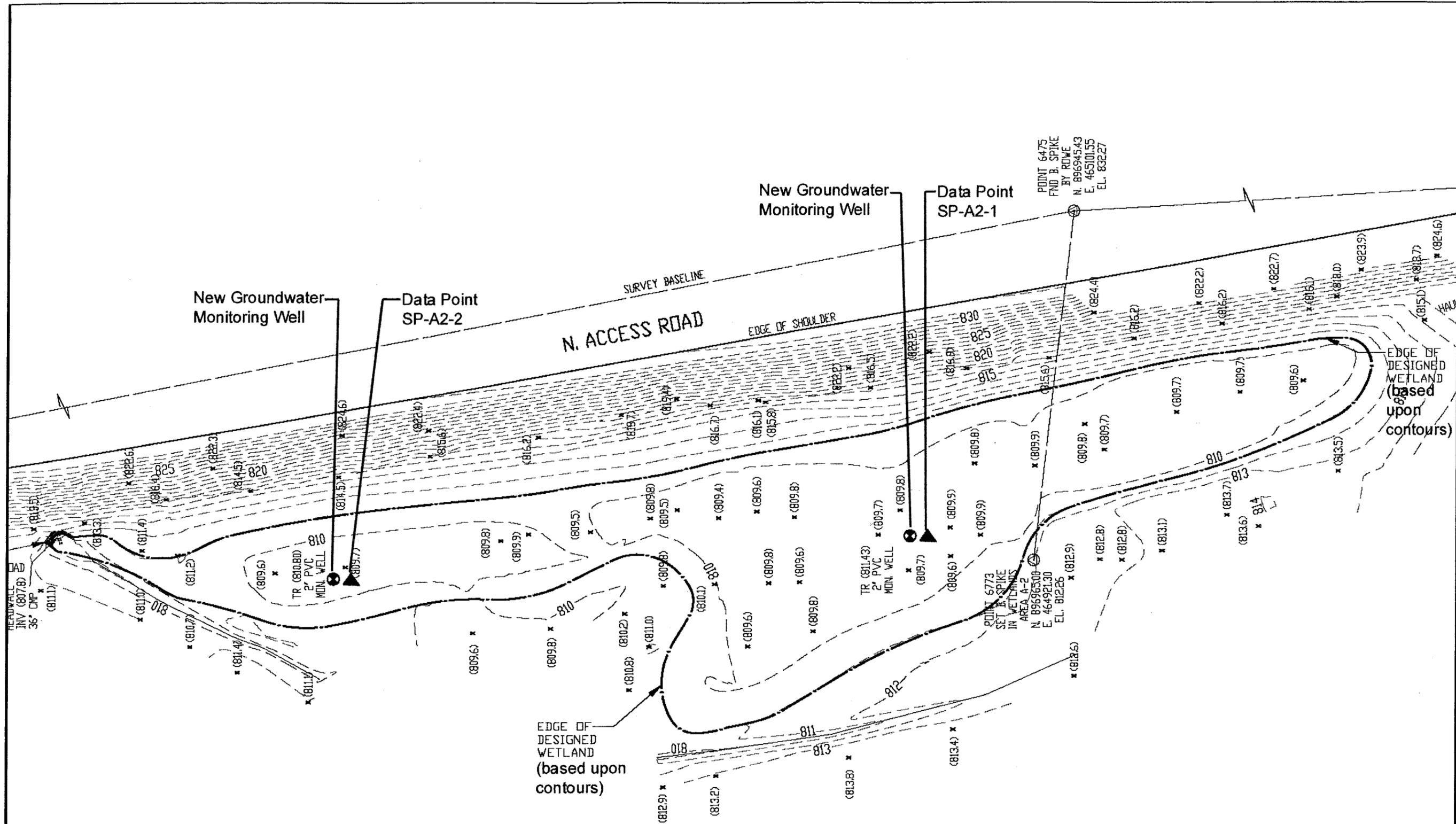
Hydrophytic Vegetation Present? Yes or No Hydric Soils Present? Yes or No
 Wetland Hydrology Present? Yes or No Is this Sampling Point Within a Wetland? Yes or No

Remarks:

Photo Reference Number:

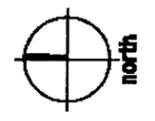
SP-A2-2 taken adjacent to northern monitoring well.

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SURVEY NOTES

1. TOPOGRAPHIC INFORMATION FROM INSTRUMENT SURVEY COMPLETED BY SEAR-BROWN ON SEPTEMBER 19, 2001 AND UPDATED BY US ON SEPTEMBER 11, 2002
2. HORIZONTAL AND VERTICAL DATUM SHOWN HEREON IS REFERENCED TO MAPPING PREPARED BY ROWE, WOODIN, PARSONS & BROVETTO ASSOCIATES AS PROVIDED BY THE NEW YORK STATE POWER AUTHORITY .



SCALE: 1"=50'

AS-BUILT SURVEY
MITIGATION AREA A2
BLENHIM-GILBOA PUMPED STORAGE POWER PROJECT
SCHOHARIE COUNTY, NEW YORK
FIGURE 2, SHEET 1

Blenheim Gilboa Slide Area Remediation Project
Wetland Mitigation Area Status Report, July 2003



Photo 1. Mitigation Area A2 facing south.



Photo 2. Mitigation Area A2 facing northeast.

Prepared By:



Mitigation Area A2

Semi-Annual Wetland Mitigation Area Status Report, July 2003
Blenheim Gilboa Slide Area Remediation Project
Blenheim, New York
Continued

Mitigation Area B

General description: Mitigation Area B is located in the vicinity of the existing man-made pond and the area previously delineated as Wetland B at the Lansing Manor Visitor's Center. See Figure 3. This area, consisting of an upper and lower basin, was designed to be approximately 1.86 acres in size, and consists of a mix of shallow open water, emergent and scrub-shrub vegetative cover types. A low berm was constructed in the path of an existing outlet stream from the pond in order to impound a portion of the existing stream flow. Additionally, a spillway was constructed at the berm to allow continued flow to the existing downstream drainage course. The area was planted with Northeast Wetland Forest/Herb Mix at a rate of 3 lbs./acre supplemented by *Verbena hastata*, *Scirpus atrovirens*, and *Glyceria grandis* each at a rate of 0.5 lbs./acre) in September 2001. Mitigation Area B has been excavated, lined with a bentonite clay liner, surfaced with topsoil, fine graded, seeded and mulched (straw). Other landscape features, such as a stone dust path and a boardwalk/deck system have also been constructed. Additionally, two groundwater-monitoring wells were installed in the mitigation area. Construction, including seeding and mulching was completed by September 21, 2001. Individual bare root shrub and emergent plantings were planted in April 2002 and included winterberry, silky dogwood, cranberry viburnum, iris (*Iris versicolor*), burreed (*Sparganium sp.*), sweetflag (*Acorus calamus*), and rushes.

Data Collection: Semiannual data was collected from Mitigation Area B by EDR Staff Ecologist Bill Trembath on June 25, 2003. Percent coverage of dominant plant species, hydrologic data, and soils data were collected in two sample points in the upper basin (SP-B-1 and SP-B-2), and at one point in the lower basin (SP-B-3). Soils in the upper basin are very dark gray (10 YR 3/1 and 10YR 3/2) and have begun to exhibit hydric soils characteristics (mottles). Soils in the lower basin are dark reddish brown (5YR 3/2) and also have begun to exhibit hydric soils characteristics. Average soils depth to the bentonite clay liner is 12", and therefore only the upper 12" of soil were inspected. A summary of the data collected is reported in the attached data collection sheets labeled SP-B-1, SP-B-2, and SP-B-3.

Photographic documentation: Photographic documentation was performed in each mitigation area during the site investigation on June 25, 2003. Representative photographs of Mitigation Area B are attached.

Dominant plant species: Refer to the attached data collection sheets labeled "Mitigation Area B" (Plot Id's B-1, B-2, and B-3). Vegetation data was collected in three separate sample plots, two in the upper basin and one in the lower basin of Mitigation Area B. The upper basin is a thriving emergent/open water wetland (see photos 1 and 2) dominated by cattails in addition to blue-flag iris, bur marigold, fowl meadowgrass, sedges, soft rush and hearty clumps of pickerelweed (*Pontederia cordata*). While the upper basin is dominated by emergent vegetation, some cranberry viburnum is persisting on the edges of the open water area.

The lower basin is taking on a more wet meadow condition and is dominated by sedges, cattails, blue vervain, narrow-leaved goldenrod (*Euthamia graminifolia*), and smartweed. Shrub species are sparse and not hardy in the lower basin. Species observed include winterberry and cranberry viburnum.

Groundwater Monitoring Well Data: Groundwater data was collected from the well in the lower basin during the June 25, 2003 site visit, while surface water conditions in the upper basin were observed. Inundation in the upper basin is highly variable (1"-18+"), with approximately 35% of the area currently in an open water condition. Edges of the upper basin are saturated or inundated just to the surface. Soils in the lower basin were inundated to approximately 1-4 inches depending on specific location. The monitoring well in the lower basin has 14 inches of water (3 inches of standing water). Although no damage to the existing wells have been observed (i.e. frost heaving), they were replaced with wells with an updated design to deter heaving.

Remedial Plan: Based upon a post-construction survey performed by Sear Brown Associates on September 21, 2001, the desired elevation of 1116' in the south basin, and 1119' in the north basin was generally achieved throughout Mitigation Area B. The as-built survey indicated that the cut spillway at the northwest end was higher than the 1119' elevation, which was designed to make a hydrologic connection with the existing pond. Additionally, at the southeast ends of both the upper and lower wetland basins, there were low spots that provided breaks in the berms surrounding these areas. Subsequently, the contractor performed recommended corrections to Mitigation Area B. This work was completed on November 8th and 9th, 2001. Additionally the spillway was lowered, as recommended in the July 2002 report.

An assessment of shrub survival was performed in May 2003. A combined of 1375 shrubs were initially planted in the upper and lower basins of Mitigation Area B. The shrub survival assessment considered sampling transects which covered approximately 12% of the basins, with transects covering areas known to be planted with shrub plantings. At the time of sampling, it appears approximately 71% shrub survival has occurred in the combined basins. The results may be reviewed with the planting contractor. Additional shrub plantings may be needed in those areas that are notably lacking shrub survival.

DATA FORM
ROUTINE WETLAND DETERMINATION
 1987 COE Wetlands Delineation Manual

Project No: 900 Applicant: NYPA - BG Date: 6/25/03
 Investigator: Trembath County: Schoharie State: NY
 Do normal circumstances exist on site? Yes No Community: SS/EME
 Is the site significantly disturbed? Yes No Transect/Flag ID: Mitigation Area B
 Is the area a potential Problem Area? Yes No Plot ID: SP-B-1

SOILS

Series and Phase: _____ Drainage Class: WD MWD SPD PD VPD
 Subgroup: _____ Confirm Mapped Type: Yes No

Depth	Horizon	Matrix color	Mottle color/abundance	Texture, Structure, Other
<u>0-2</u>	<u>A</u>	<u>10YR 3/1</u>	<u>None</u>	<u>Organic, silt</u>
<u>2-10</u>	<u>B</u>	<u>5YR 3/2</u>	<u>None</u>	<u>Clay</u>

Hydric Soil Indicators:
 Histisols Concretions Listed on Local Hydric Soils List
 Histic Epipedon High Org. Content in Surface Layer of Sandy Soils Listed as Potential for Hydric Inclusions Only
 Sulfidic Odor Organic Streaking in Sandy Soils Other (Explain in Remarks)
 Reducing Conditions Gleyed or Low Chroma color Aquic Moisture Regime

Landscape position: concave _____ convex _____ sloping _____ Approximate slope: _____
 flat undulating _____

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks)
 _____ No Recorded Data Available
 _____ Stream, Lake or Tide Gauge
 _____ Aerial Photographs

Field Observations
 Ground Surface Inundated 3-5 inches.
 Soil Saturated.
 Depth to Free Water 0 inches.
 Depth to Saturated Soils 0 inches.

Wetland Hydrology Indicators:

Primary Indicators
 Inundated
 Saturated in upper 12 inches.
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetland

Secondary Indicators (2 or more required)
 Oxidized Root Channels in upper 12 inches
 Water-Stained leaves
 Local Soil Survey
 Morphological Plant Adaptations
 Other (Explain in Remarks)

Remarks:

Project Number:

900

Applicant:

NYPA - B-G

Date:

6/25/03

Plot ID Number:

SP-B-1

VEGETATION

Dominant Plant Species:	Stratum: (circle one)	Indicator:	% Cover:
1 <u>Thin leaf cattail</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>50</u>
2 <u>Spike rush</u>	<input checked="" type="radio"/> H S/S T V	<u>NL</u>	<u>20</u>
3 <u>Rice cut grass</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>15</u>
4 <u>Fowl meadowgrass</u>	<input checked="" type="radio"/> H S/S T V	<u>FACW</u>	<u>5</u>
5 <u>Soft rush</u>	<input checked="" type="radio"/> H S/S T V	<u>FACW+</u>	<u>5</u>
6 <u>Arrowhead (Sagittaria latifolia)</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>5</u>
7 _____	H S/S T V	_____	_____
8 _____	H S/S T V	_____	_____
9 _____	H S/S T V	_____	_____
10 _____	H S/S T V	_____	_____
11 _____	H S/S T V	_____	_____
12 _____	H S/S T V	_____	_____
13 _____	H S/S T V	_____	_____
14 _____	H S/S T V	_____	_____
15 _____	H S/S T V	_____	_____
16 _____	H S/S T V	_____	_____

Percent of Dominant Species OBL, FACW, FAC 80+

Percent of Dominant Species OBL, FACW 80+

50/20 Rule Applied? Yes No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes or No

Hydric Soils Present? Yes or No

Wetland Hydrology Present? Yes or No

Is this Sampling Point Within a Wetland? Yes or No

Remarks:

Photo Reference Number:

SP-B-1 done in the lower wetland area near the existing water level monitoring well.

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DATA FORM
 ROUTINE WETLAND DETERMINATION
 1987 COE Wetlands Delineation Manual

Project No: 900 Applicant: NYPA - B-G Date: 6/25/03
 Investigator: Trembath Town: Blenheim
 County: Schoharie
 State: NY

Do normal circumstances exist on site? Yes No Community: EME
 Is the site significantly disturbed? Yes No Transect/Flag ID: Mitigation
 Is the area a potential Problem Area? Yes No Plot ID: SP B-2

SOILS

Series and Phase: _____ Drainage Class: WD MWD SPD PD VPD
 Subgroup: _____ Confirm Mapped Type: Yes No

Depth	Horizon	Matrix color	Mottle color/abundance	Texture, Structure, Other
<u>0-10</u>	<u>A</u>	<u>10YR 3/2</u>	<u>10YR 5/6, Few</u>	<u>Clay</u>

Hydric Soil Indicators:

<input type="checkbox"/> Histisols	<input type="checkbox"/> Concretions	<input type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Org. Content in Surface Layer of Sandy Soils	<input type="checkbox"/> Listed as Potential for Hydric Inclusions Only
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Gleyed or Low Chroma color	<input type="checkbox"/> Aquic Moisture Regime

Landscape position: concave _____ convex _____ sloping _____ Approximate slope: _____
 flat undulating _____

Remarks: _____

HYDROLOGY

<input type="checkbox"/> Recorded Data (Describe in Remarks)	Field Observations
<input type="checkbox"/> No Recorded Data Available	<input checked="" type="checkbox"/> Ground Surface Inundated <u>> 12</u> inches.
<input type="checkbox"/> Stream, Lake or Tide Gauge	<input checked="" type="checkbox"/> Soil Saturated.
<input type="checkbox"/> Aerial Photographs	Depth to Free Water <u>0</u> inches.
	Depth to Saturated Soils <u>0</u> inches.

Wetland Hydrology Indicators:

Primary Indicators	Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Inundated	<input type="checkbox"/> Oxidized Root Channels in upper 12 inches
<input checked="" type="checkbox"/> Saturated in upper 12 inches.	<input type="checkbox"/> Water-Stained leaves
<input checked="" type="checkbox"/> Water Marks	<input type="checkbox"/> Local Soil Survey
<input type="checkbox"/> Drift Lines	<input type="checkbox"/> Morphological Plant Adaptations
<input type="checkbox"/> Sediment Deposits	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Drainage Patterns in Wetland	

Remarks: Significant portions of the upper basin of mitigation area B have substantial (>6") standing/open water.

s:\edr office files\forms\Data Form Routine Wetland Determination.xls

Project Number: 900
 Applicant: NYPA - B-G

Date: 6/25/03
 Plot ID Number: SP-B-2

VEGETATION

Dominant Plant Species:	Stratum: (circle one)	Indicator:	% Cover:
1 <u>Thin leaf cattail</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>60</u>
2 <u>Pickrel weed (Pontederia cordata)</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>20</u>
3 <u>Rice cut grass</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>10</u>
4 <u>Blue flag (Iris versicolor)</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>5</u>
5 <u>Yellow iris (Iris pseudacorus)</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>5</u>
6 _____	H S/S T V	_____	_____
7 _____	H S/S T V	_____	_____
8 _____	H S/S T V	_____	_____
9 _____	H S/S T V	_____	_____
10 _____	H S/S T V	_____	_____
11 _____	H S/S T V	_____	_____
12 _____	H S/S T V	_____	_____
13 _____	H S/S T V	_____	_____
14 _____	H S/S T V	_____	_____
15 _____	H S/S T V	_____	_____
16 _____	H S/S T V	_____	_____

Percent of Dominant Species OBL, FACW, FAC 100 Percent of Dominant Species OBL, FACW 100
 50/20 Rule Applied? Yes No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes or No Hydric Soils Present? Yes or No
 Wetland Hydrology Present? Yes or No Is this Sampling Point Within a Wetland? Yes or No

Remarks:

Photo Reference Number:

SP-B-2 taken ~20' NW of water level monitoring well due to level of standing water (~20") and lack of vegetation.

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DATA FORM
 ROUTINE WETLAND DETERMINATION
 1987 COE Wetlands Delineation Manual

Project No: 900 Applicant: NYPA - B-G Date: 6/25/03
 Investigator: Trembath County: Schoharie State: NY
 Community: EME
 Is the site significantly disturbed? Yes No
 Is the area a potential Problem Area? Yes No
 Transect/Flag ID: Mitigation Area B
 Plot ID: SP-B-3

SOILS

Series and Phase: _____ Drainage Class: WD MWD SPD PD VPD
 Subgroup: _____ Confirm Mapped Type: Yes No
 Depth Horizon Matrix color Mottle color/abundance Texture, Structure, Other
0-10 A 10YR 3/2 10YR 5/6, FOW Clay

Hydric Soil Indicators:
 Histisols Concretions Listed on Local Hydric Soils List
 Histic Epipedon High Org. Content in Surface Layer of Sandy Soils Listed as Potential for Hydric Inclusions Only
 Sulfidic Odor Organic Streaking in Sandy Soils Other (Explain in Remarks)
 Reducing Conditions Gleyed or Low Chroma color Aquic Moisture Regime

Landscape position: concave convex _____ sloping _____ Approximate slope: _____
 flat _____ undulating _____

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks)
 No Recorded Data Available
 Stream, Lake or Tide Gauge
 Aerial Photographs

Field Observations
 Ground Surface Inundated 1-2 inches.
 Soil Saturated.
 Depth to Free Water 0 inches.
 Depth to Saturated Soils 1 inches.

Wetland Hydrology Indicators:

Primary Indicators
 Inundated
 Saturated in upper 12 inches.
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetland

Secondary Indicators (2 or more required)
 Oxidized Root Channels in upper 12 inches
 Water-Stained leaves
 Local Soil Survey
 Morphological Plant Adaptations
 Other (Explain in Remarks)

Remarks: Water marks on herbaceous vegetation.

Project Number:

900

Date:

6/25/03

Applicant:

NYPA - B-G

Plot ID Number:

SP-B-3

VEGETATION

Dominant Plant Species:	Stratum: (circle one)	Indicator:	% Cover:
1 <u>Fowl meadowgrass</u>	<input checked="" type="radio"/> H S/S T V	<u>FACW</u>	<u>15</u>
2 <u>Carex sp.</u>	<input checked="" type="radio"/> H S/S T V	<u>FACW/OBL</u>	<u>15</u>
3 <u>Rice Cut Grass</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>35</u>
4 <u>Thin leaf cattail</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>25</u>
5 <u>Yellow iris</u>	<input checked="" type="radio"/> H S/S T V	<u>OBL</u>	<u>5</u>
6 <u>Silky dogwood</u>	H <input checked="" type="radio"/> S/S T V	<u>FACW</u>	<u>5</u>
7 _____	H S/S T V	_____	_____
8 _____	H S/S T V	_____	_____
9 _____	H S/S T V	_____	_____
10 _____	H S/S T V	_____	_____
11 _____	H S/S T V	_____	_____
12 _____	H S/S T V	_____	_____
13 _____	H S/S T V	_____	_____
14 _____	H S/S T V	_____	_____
15 _____	H S/S T V	_____	_____
16 _____	H S/S T V	_____	_____

Percent of Dominant Species OBL, FACW, FAC 100

Percent of Dominant Species OBL, FACW 100

50/20 Rule Applied? Yes No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes or No

Hydric Soils Present? Yes or No

Wetland Hydrology Present? Yes or No

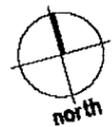
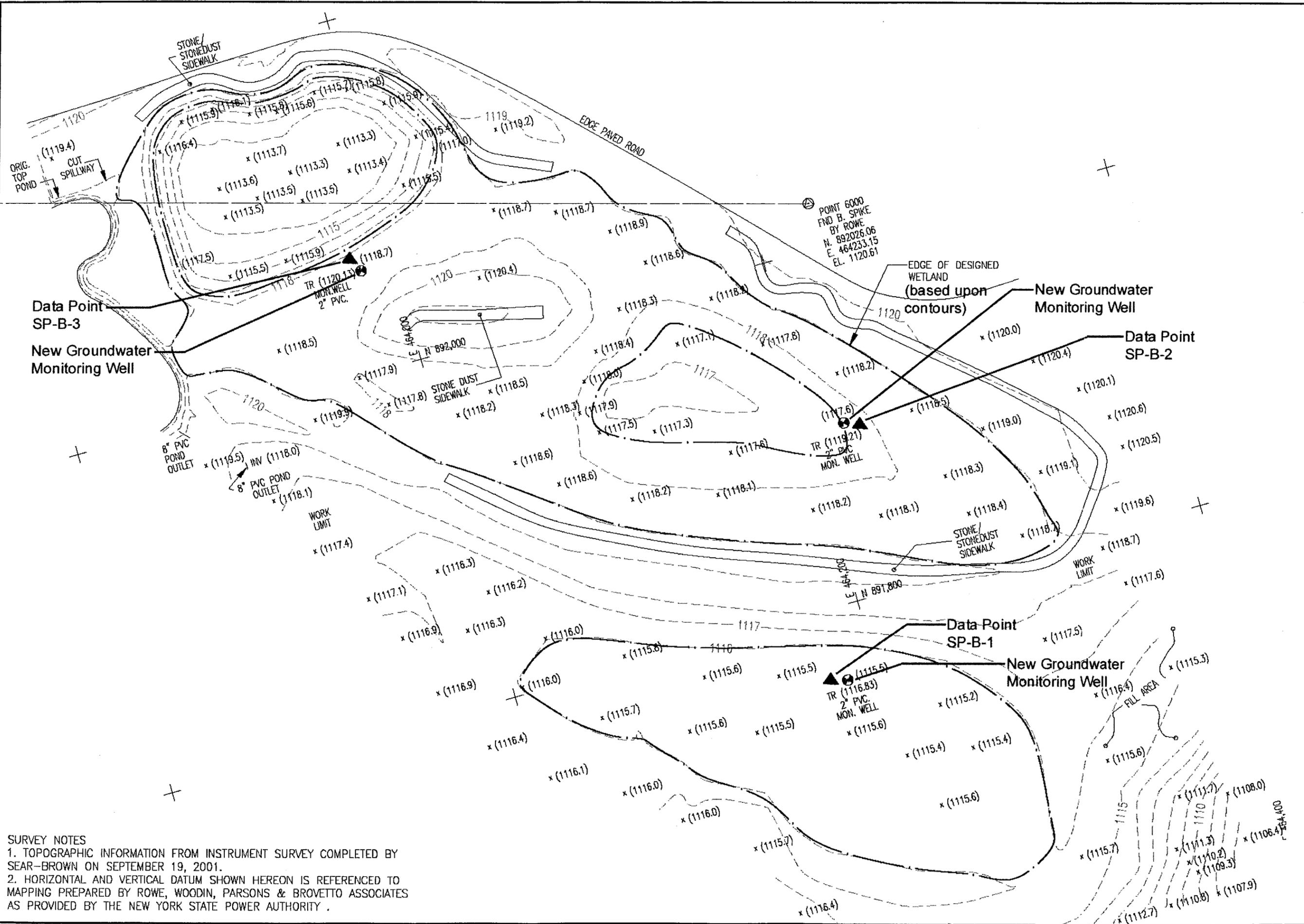
Is this Sampling Point Within a Wetland? Yes or No

Remarks:

Photo Reference Number:

SP-B-3 taken in the upper basin of Mitigation Area B, near the northernmost water level monitoring well and ~20' north of wooden boardwalk.

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SCALE: 1"=50'

SURVEY NOTES
 1. TOPOGRAPHIC INFORMATION FROM INSTRUMENT SURVEY COMPLETED BY SEAR-BROWN ON SEPTEMBER 19, 2001.
 2. HORIZONTAL AND VERTICAL DATUM SHOWN HEREON IS REFERENCED TO MAPPING PREPARED BY ROWE, WOODIN, PARSONS & BROVETTO ASSOCIATES AS PROVIDED BY THE NEW YORK STATE POWER AUTHORITY.

AS-BUILT SURVEY
MITIGATION AREA B
 BLENHEIM-GILBOA PUMPED STORAGE POWER PROJECT
 SCHOHARIE COUNTY, NEW YORK
 FIGURE 3, SHEET 1

Blenheim Gilboa Slide Area Remediation Project
Wetland Mitigation Area Status Report, July 2003



Photo 1. Mitigation Area B (Lower basin) facing west.



Photo 2. Mitigation Area B (Lower basin) facing southeast, near sample point SP-B-1.

Prepared By:



Mitigation Area B

Blenheim Gilboa Slide Area Remediation Project
Wetland Mitigation Area Status Report, July 2003



Photo 3. Mitigation Area B (Upper basin) facing northwest, near sample point SP-B-2.



Photo 4. Mitigation Area B (Upper basin) facing east, near sample point SP-B-3.

Prepared By:



Mitigation Area B

Semi-Annual Wetland Mitigation Area Status Report, July 2002

Blenheim Gilboa Slide Area Remediation Project

Blenheim, New York

Continued

Mitigation Area D

General description: Mitigation Area D is located in a previously level upland area adjacent to the wetland previously identified by EDR as Wetland D. See Figure 4. Mitigation Area D was designed to develop a 2.4 acres wetland with a finished primary basin low elevation of 818' and an internal deeper basin with a finished elevation of 816.9' above sea level. The primary basin area was designed to be excavated adjacent to the existing wetland to collect shallow groundwater and impound surface water runoff. The area was planted with Northeast Wetland Forest/Herb Mix at a rate of 3lbs./acre (supplemented by *Verbena hastata*, *Scirpus atrovirens*, and *Glyceria grandis* each at a rate of 0.5 lbs./acre) in addition to individual bare root emergent wetland and shrub wetland plantings. Mitigation Area D has been excavated, lined with a bentonite clay liner, surfaced with top soil, fine graded, seeded and mulched (straw). Additionally, two groundwater-monitoring wells were installed in the mitigation area. Construction was completed by September 21, 2001. Individual bare root herbaceous and shrub plantings were placed in April 2002. These plantings include sweet flag, sedges, rushes, silky dogwood, speckled alder, arrowwood and willow. Remediation efforts were undertaken in June 2002 to add 0.33 acres to the east end of Area D, to increase the size of the mitigation area.

Data Collection: Semiannual data was collected from Mitigation Area D by EDR Staff Ecologist Bill Trembath on June 25, 2003. Percent coverage of dominant plant species and hydrologic data, and soils data were collected in two sample points. Soils were variable from very dark gray brown (10YR 3/2) to grayish brown (10YR 5/2). Average soils depth to the bentonite clay liner is 12", and therefore only the upper 12" of soil were inspected. A summary of the data collected is reported in the attached data collection sheet labeled "Mitigation Area D" (Plot ID's SP-D-1, and SP-D-2).

Photographic documentation: Photographic documentation was performed in each mitigation area during the site investigation on October 10, 2002. Representative photographs of Mitigation Area D are attached.

Dominant plant species: Refer to the attached data collection sheets labeled "Mitigation Area D". Two data points were taken, one in each of the locations of the groundwater monitoring wells (sample plots D-1 and D-2). Sample plot D-1 was taken adjacent to the addition to the mitigation area, which was graded and planted in June 2002. Presently the area is sporadically vegetated (see photo 1) with sedges, cattails, blue vervain, alders, and seedlings of cottonwood (*Populus deltoids*). In general, compacted and unsuitable soils (gravelly) in the remediated area are inhibiting vegetative growth. Wet pockets are vegetated but dry areas are lacking vegetative cover resulting in only 30%-40% overall cover in the area. Shrub growth appears sparse in areas.

Sample plot D-2 was taken adjacent to the existing well in the western area of Mitigation D. Vegetation in this location is 100% upland old-field species including chickory, (*Chichorium intybus*), timothy (*Phleum pratense*), red top (*Agrostis alba*), and red clover (*Trifolium pratense*). However, this is not indicative of the entire area. The central basin is doing well and is dominated by emergent species such as spike rush, cattails, sedges, and water plantain. The area surrounding the central basin is covered with smartweed, bur marigold, alder, and cattails. No evidence of invasion by common reed or purple loosestrife was found. A robust population of common reed is established immediately to the south end of Mitigation Area D. It has not been

recommended to eradicate the existing population of common reed with chemical methods, as it is interspersed in a shrub community of willows. Invasion by common reed in Wetland D should be closely monitored.

Groundwater Monitoring Well Data: Groundwater data was not collected from the installed wells during the June 25, 2003 site evaluation since they were not in a vertical position due to heaving caused by environmental stresses (i.e. frost heaving, wind, etc.). However, surface water conditions were observed. Inundation throughout the area is variable with dry soils to as much as 10 inches in the center of the basin in Area D. The supplemental remediated area is saturated at the surface with pockets of inundation up to 4 inches. The heaved monitoring wells were removed and replaced on June 26, 2003.

Remedial Plan: A post-construction survey performed by Sear Brown Associates on September 28, 2001 indicated the desired elevation of the main basin of 818' was generally achieved in some areas of Mitigation Area D. As with the other mitigation areas, the basin was designed to hold the 818' contour to the edge of the mitigation area, then rise abruptly rather than having a gradually sloping edge. However, the perimeter of the wetland, and especially in a sizeable portion of the southeastern edge of the mitigation area, the 818' contour is well within the edge of the work area, which suggested a smaller acreage of wetland would develop than designed. It is estimated, based solely upon as-built contours, that the area anticipated to develop into wetland might have been up to an acre less than designed. In order to remediate the acreage deficit in Mitigation Area D, recommendations were made, to provide for additional wetland acreage. Berm adjustments and spot corrections in Mitigation Area D, which included excavation of the appropriate edge areas exceeding 818', were performed on November 8th and 9th 2001. However, in many locations, the liner depth did not significantly exceed 12" and these corrective measures did not provide a suitable elevation for wetland development. Remedial efforts since the November 2001 Status Report have addressed recommendations. Because only minimal spot corrections were feasible, an additional 0.33 acres area was added to the eastern edge of Area D. This area was graded and planted primarily with wetland shrub plantings in June 2002. It appears that wetland vegetation and hydrology have become established within the design contour; which does not coincide with the initial design edge. The additional 0.33 acre area is becoming established but vegetative growth has been inhibited by insufficient topsoil dressing prior to planting.

Approximately 2050 shrubs were planted in Area D in April and June 2002. Based upon a sample plot (multiple transects) covering more than 10% of the mitigation area, it appears that shrub survival is 73%. An assessment of shrub survival was performed in May 2003. The results may be reviewed with the planting contractor. Additional shrub plantings may be needed in those areas lacking shrub survival.

DATA FORM
ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Delineation Manual

Project No: 900 Applicant: NYPA - B-G Date: 6/25/03
Investigator: Trembath County: Schoharie
Town: Blenheim
State: NY

Do normal circumstances exist on site? Yes No Community: EME
Is the site significantly disturbed? Yes No Transect/Flag ID: Mitigation Area D
Is the area a potential Problem Area? Yes No Plot ID: SP-D-1

SOILS

Series and Phase: _____ Drainage Class: WD MWD SPD PD VPD
Subgroup: _____ Confirm Mapped Type: Yes No

Depth	Horizon	Matrix color	Mottle color/abundance	Texture, Structure, Other
<u>0-10</u>	<u>A</u>	<u>10YR 4/3</u>	<u>10YR 5/2, Abundant</u>	<u>Fine sand loam</u>

Hydric Soil Indicators:

Histisols Concretions Listed on Local Hydric Soils List
 Histic Epipedon High Org. Content in Surface Layer of Sandy Soils Listed as Potential for Hydric Inclusions Only
 Sulfidic Odor Organic Streaking in Sandy Soils Other (Explain in Remarks)
 Reducing Conditions Gleyed or Low Chroma color Aquic Moisture Regime

Landscape position: concave _____ convex _____ sloping _____ Approximate slope: _____
flat undulating _____

Remarks:

HYDROLOGY

_____ Recorded Data (Describe in Remarks)
_____ No Recorded Data Available
_____ Stream, Lake or Tide Gauge
_____ Aerial Photographs

Field Observations
 Ground Surface Inundated 1-3 inches.

Soil Saturated.

Depth to Free Water _____ inches.

Depth to Saturated Soils _____ inches.

Wetland Hydrology Indicators:

Primary Indicators

Inundated
 Saturated in upper 12 inches.
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetland

Secondary Indicators (2 or more required)

Oxidized Root Channels in upper 12 inches
 Water-Stained leaves
 Local Soil Survey
 Morphological Plant Adaptations
 Other (Explain in Remarks)

Remarks:

Water marks on herbaceous vegetation.

Project Number:

900

Date:

6/25/03

Applicant:

NYPA - B-G

Plot ID Number:

SP-D-1

VEGETATION

Dominant Plant Species:	Stratum: (circle one)	Indicator:	% Cover:
1 Rice cut grass	<input checked="" type="radio"/> H S/S T V	OBL	40
2 Silky dogwood	H <input checked="" type="radio"/> S/S T V	FACW	10
3 Cottonwood saplings	H <input checked="" type="radio"/> S/S T V	FAC	10
4 Thin leaf cattail	<input checked="" type="radio"/> H S/S T V	OBL	20
5 Water plantain	<input checked="" type="radio"/> H S/S T V	OBL	10
6 Fowl meadowgrass	<input checked="" type="radio"/> H S/S T V	FACW	5
7 Orchard grass	<input checked="" type="radio"/> H S/S T V	FACU	5
8	H S/S T V		
9	H S/S T V		
10	H S/S T V		
11	H S/S T V		
12	H S/S T V		
13	H S/S T V		
14	H S/S T V		
15	H S/S T V		
16	H S/S T V		

Percent of Dominant Species OBL, FACW, FAC 95

Percent of Dominant Species OBL, FACW 85

50/20 Rule Applied? Yes No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes or No

Hydric Soils Present? Yes or No

Wetland Hydrology Present? Yes or No

Is this Sampling Point Within a Wetland? Yes or No

Remarks:

Photo Reference Number:

SP-D-1 taken adjacent to the east monitoring well.

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DATA FORM
ROUTINE WETLAND DETERMINATION
 1987 COE Wetlands Delineation Manual

Project No: 900 Applicant: NYPA - B-6 Date: 6/25/03
 Investigator: Trembath Town: Blenheim
 County: Schoharie
 State: NY

Do normal circumstances exist on site? Yes No Community: EME
 Is the site significantly disturbed? Yes No Transect/Flag ID: Mitigation Area D
 Is the area a potential Problem Area? Yes No Plot ID: SP-D-2

SOILS

Series and Phase: _____ Drainage Class: WD MWD SPD PD VPD
 Subgroup: _____ Confirm Mapped Type: Yes No

Depth	Horizon	Matrix color	Mottle color/abundance	Texture, Structure, Other
<u>0-10</u>	<u>A</u>	<u>10YR 4/3</u>	<u>10YR 5/2 Mod. Abund.</u>	<u>Fine sand loam</u>

Hydric Soil Indicators:

- | | | |
|--|---|---|
| <input type="checkbox"/> Histisols | <input type="checkbox"/> Concretions | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input checked="" type="checkbox"/> High Org. Content in Surface Layer of Sandy Soils | <input type="checkbox"/> Listed as Potential for Hydric Inclusions Only |
| <input type="checkbox"/> Sulfidic Odor | <input checked="" type="checkbox"/> Organic Streaking in Sandy Soils | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Gleyed or Low Chroma color | <input type="checkbox"/> Aquic Moisture Regime |

Landscape position: concave _____ convex _____ sloping _____ Approximate slope: _____
 flat undulating _____

Remarks:

HYDROLOGY

- Recorded Data (Describe in Remarks)
 _____ No Recorded Data Available
 _____ Stream, Lake or Tide Gauge
 _____ Aerial Photographs

- Field Observations**
 _____ Ground Surface Inundated _____ inches.
 Soil Saturated.

Depth to Free Water _____ inches.
 Depth to Saturated Soils 4 inches.

Wetland Hydrology Indicators:

- Primary Indicators
 Inundated
 Saturated in upper 12 inches.
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetland

- Secondary Indicators (2 or more required)
 Oxidized Root Channels in upper 12 inches
 Water-Stained leaves
 Local Soil Survey
 Morphological Plant Adaptations
 Other (Explain in Remarks)

Remarks: 1-2" of standing water within 10 feet of sample point.

Project Number: 900
 Applicant: NYPA - B-G

Date: 6/25/03
 Plot ID Number: SP-D-2

VEGETATION

Dominant Plant Species:	Stratum: (circle one)	Indicator:	% Cover:
1 <u>Carex sp.</u>	<input checked="" type="radio"/> H S/S T V	<u>FACW/OBL</u>	<u>40</u>
2 <u>Cottonwood saplings</u>	H <input checked="" type="radio"/> S/S T V	<u>FAC</u>	<u>15</u>
3 <u>Red clover</u>	<input checked="" type="radio"/> H S/S T V	<u>FACU-</u>	<u>25</u>
4 <u>White aster (small)</u>	<input checked="" type="radio"/> H S/S T V	<u>FAC</u>	<u>10</u>
5 <u>Oxeye daisy</u>	<input checked="" type="radio"/> H S/S T V	<u>NL</u>	<u><5</u>
6 <u>Field buttercup</u>	<input checked="" type="radio"/> H S/S T V	<u>FAC+</u>	<u><5</u>
7 <u>Timothy</u>	<input checked="" type="radio"/> H S/S T V	<u>FACU</u>	<u><5</u>
8 <u>Orchard grass</u>	<input checked="" type="radio"/> H S/S T V	<u>FACU</u>	<u><5</u>
9 _____	H S/S T V	_____	_____
10 _____	H S/S T V	_____	_____
11 _____	H S/S T V	_____	_____
12 _____	H S/S T V	_____	_____
13 _____	H S/S T V	_____	_____
14 _____	H S/S T V	_____	_____
15 _____	H S/S T V	_____	_____
16 _____	H S/S T V	_____	_____

Percent of Dominant Species OBL, FACW, FAC 65+

Percent of Dominant Species OBL, FACW 40

50/20 Rule Applied? Yes No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes or No

Hydric Soils Present? Yes or No

Wetland Hydrology Present? Yes or No

Is this Sampling Point Within a Wetland? Yes or No

Remarks:

Photo Reference Number:

SP-D-2 taken adjacent to western monitoring well near wetland/upland boundary.

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Project Number:

900

Date:

6/25/03

Applicant:

NYPA - B-G

Plot ID Number:

SP-D-1

VEGETATION

Dominant Plant Species:	Stratum: (circle one)	Indicator:	% Cover:
1 Rice cut grass	<input checked="" type="radio"/> H S/S T V	OBL	40
2 Silky dogwood	H <input checked="" type="radio"/> S/S T V	FACW	10
3 Cottonwood saplings	H <input checked="" type="radio"/> S/S T V	FAC	10
4 Thin leaf cattail	<input checked="" type="radio"/> H S/S T V	OBL	20
5 Water plantain	<input checked="" type="radio"/> H S/S T V	OBL	10
6 Fowl meadowgrass	<input checked="" type="radio"/> H S/S T V	FACW	5
7 Orchard grass	<input checked="" type="radio"/> H S/S T V	FACU	5
8	H S/S T V		
9	H S/S T V		
10	H S/S T V		
11	H S/S T V		
12	H S/S T V		
13	H S/S T V		
14	H S/S T V		
15	H S/S T V		
16	H S/S T V		

Percent of Dominant Species OBL, FACW, FAC 95

Percent of Dominant Species OBL, FACW 85

50/20 Rule Applied? Yes No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes or No

Hydric Soils Present? Yes or No

Wetland Hydrology Present? Yes or No

Is this Sampling Point Within a Wetland? Yes or No

Remarks:

Photo Reference Number:

SP-D-1 taken adjacent to the east monitoring well.

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Blenheim Gilboa Slide Area Remediation Project
Wetland Mitigation Area Status Report, July 2003



Photo 1. Mitigation Area D facing northeast, near sample point SP-D-2.



Photo 2. Northeast corner of Mitigation Area D facing south.

Prepared By:



Mitigation Area D

Blenheim Gilboa Slide Area Remediation Project
Wetland Mitigation Area Status Report, July 2003



Photo 3. Mitigation Area D facing southeast from western boundary of wetland area.



Photo 4. Southeast corner of Mitigation Area D facing south.

Prepared By:



Mitigation Area D