

# **DETERMINATION AND DELINEATION OF WETLAND AREAS WITHIN THE LOST RIVER DAM SITE 16 PROJECT AREA CONSTRUCTION LIMITS**



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## **INTRODUCTION**

The interaction of hydrology, vegetation and soil results in the characteristics unique to wetlands. The United States Environmental Protection Agency (USEPA) and the United States Army Corps of Engineers (USACE) jointly define wetlands as:

*“Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.”*

## **PURPOSE**

This report was initiated due to the proposed construction of a multi purpose (flood control and water supply) dam and associated structures within the Lost River watershed. The purpose of this investigation is to determine the amount of wetlands within the construction limits of the Natural Resources Conservation Service (NRCS) project entitled Lost River Dam Site 16 and then delineate those areas meeting the current wetland criteria.

This document outlines the location of identified wetlands within the construction limits of the proposed dam and borrow area. Delineation of wetlands is necessary to determine the amount of impact to the resource and to establish benchmark conditions. No recognized methodology was utilized to determine the functionality or value of the identified wetlands and is considered beyond the scope of this investigation. However, a general assessment is provided in the Summary and Conclusions section of this document.

## **PROJECT LOCATION**

This report evaluates approximately 232 acres comprising the proposed project boundaries along Lower Cove Run. It is located in Hardy County, West Virginia within the Lost River Valley. It is within the Cacapon Watershed, Hydrologic Unit 02070003 Cacapon River.

Specifically, the proposed Lost River Dam Site 16 is on Lower Cove Run, about 2,000 feet upstream from the town of Lost City and approximately 2,000 feet downstream from the boundary of the George Washington National Forest, at 38° 56' N latitude and 78° 50' W longitude. The proposed site will impound a portion of Lower Cove Run between the boundary of the George Washington National Forest and State Route 259. Refer to the location map(s) in the appendix of this document.

## **BACKGROUND**

A review of the records at the Natural Resources Conservation Service (NRCS) Moorefield Field Office revealed that the area has had no known prior wetland determinations for United States Department of Agriculture (USDA) programs and has not historically participated in USDA programs. Therefore, no wetland determinations performed for the Food Security Act of 1985 that are certified for 1972 Clean Water Act (CWA) purposes exist.

Based on contacts with regulatory agencies, the area has had no known wetland delineations performed under the 1972 Clean Water Act for any other purpose.

Reviews of the National Wetland Inventory (NWI) maps provide evidence of palustrine emergent marshes (i.e. PEMxx). Refer to the National Wetland Inventory map(s) in the Appendix of this document.

Since no previous determinations or delineations existed for the area, NRCS staff was requested to perform a delineation which included all areas within the borrow and construction limits. Although there is evidence that wetlands exist within the easement area of the proposed project, these areas were not included in this report since they will not be affected by construction activities.

## METHODOLOGY

This delineation was performed using the procedures and methodologies outlined in the *Corps of Engineers Wetlands Delineation Manual - Technical Report Y-87-1* (January 1987).

Hydrology was verified by the presence of at least two secondary hydrologic indicators or one primary indicator. Verification of hydric soils was determined by the presence of hydric soil indicators and comparison of soil characteristics using the *Field Indicators of Hydric Soils in the Mid-Atlantic United States version 6.0*. The presence of hydrophytic vegetation was determined using the routine methodology outlined in the 1987 ACOE Wetlands Delineation Manual and the 50/20 Rule. This information was recorded on the Standard Data Form for Routine Wetland Determinations from the ACOE Wetlands Delineation Manual. These forms are included in the Appendix of this document and originals are maintained in the case file within USDA.

In most instances it was extremely difficult to determine the natural plant community and hydrologic regime due to ongoing agricultural activities. The vegetation and hydrology on this site has been significantly altered. Vegetation has been removed in several ways including livestock grazing, disking and plowing, re-planting and crop production. Hydrology was altered through ditches, diversions and fill. A review of historical aerial photography indicates that this area has:

1. been in continuous agricultural production (cropping, haying & grazing) since at least the 1930's; and more than likely since before 1900; and
2. the hydrology has been removed, diverted or otherwise altered via bedding systems, culverts, diversions and drainage ditches.

Therefore, most areas described in this delineation were performed using the “**Atypical Situation**” where “**Normal Circumstances**” did not exist.

The entire area within the construction limits was examined. Areas that exhibited wetland characteristics were given more detailed examination. This involved dozens of soil probings and comparing results against hydric criteria. Areas within the boundary having similar soils, vegetation and hydrologic indicators were located and established as test pits (TP1 - TP7). A total of seven test pits were located throughout the project site where the soils, vegetation and hydrologic indicators were described in detail. Flagging was set at the point where one or more of the three wetland parameters ceased. (In most instances, this was defined by the edge of the hydric soil boundary due to the atypical situations described above.) Test pits and flagged boundary markers were surveyed by NRCS personnel and shown on the final results.

## RESULTS

Eight separate areas were identified as meeting the wetland criteria. These areas were lumped into three groups for description purposes due to similar geomorphic settings. They are loosely described as follows:

Geomorphic Setting	Mapped Areas	Included Descriptions
Bottomlands	Area 1	TP 1 through TP4
Abandoned Stream Meanders	Areas 2, 3, 4, 5 and 6	TP 5 and TP6
Hillside Seeps	Areas 7 and 8	TP7

### Area 1 Including TP-1 through TP-4

#### General

At the time of this investigation, an extended dry period was occurring. Hydrology and rainfall data is included in this study. Refer to the section entitled Hydrology Data. Specific data may be found on TP1 - 4 data sheets. Also, photographs for TP1- 4 are included. The findings for Area 1 are summarized below.

Area 1 is the largest contiguous wetland within the boundary having a total acreage of 24.31 acres. The area starts at the northwest end of the construction limits and continues eastward through the majority of the bottomlands. The agricultural uses of these fields are cropland, hay and pasture. The area contains two dug out farm ponds (**AW**'s) totaling 0.22 acres. These areas are not included in the total acreage of wetlands identified (AW included = 24.53 acres). The area is riddled with dozens of drainage ditches and bedding systems which carry surface water and intercept subsurface waters. Although only a few drainage ditches are being actively maintained, all relic ditches are functioning to some degree.

#### Vegetation

The prevalent vegetation consisted of macrophytes that are typically adapted to areas having hydrophytic species, due to morphological, physiological and/or reproductive adaptations, have the ability to grow, effectively compete, reproduce and/or persist in anaerobic soil conditions.

Most of the hydrophytic communities that were present in Area 1 are comprised of various densities of *Juncus sp.*, *Carex sp.*, *Polygonum sp.*, *Scirpus sp.* and various forage species. Cattle are heavily grazing all fields including the cropfield, to the fenceline at the second access road. Overgrazing is so severe that much of Area 1 is bare ground and vegetation is trampled, compacted and/or non-existent. Livestock grazing of all succulent hydrophytes occurred immediately upon emergence. No trees or shrubs are present except for occasional *Rosa multiflora* along or adjacent to fencerows. One field is currently in corn (*Zea mays* spp. *mays*) and has recently been harvested. This field had no cover except for corn stubble.

The percentage of hydrophytic vegetation in each of the four TPs within this boundary range from 0 - 100% using the 50/20 Rule. According to the 1987 ACOE Wetlands Delineation Manual, at least 50% of the vegetation must be hydrophytic for the area in question to be considered a wetland. Nonetheless, this area was considered a wetland due to the presence of hydric soils and wetland hydrology using the procedures in the 1987 ACOE Wetland Delineation

Manual for an Atypical Situation not under Normal Circumstances. Wetland vegetation was significantly disturbed and hydrology was significantly altered. Current management practices have altered hydrophytic communities that would normally be present on the site.

## Hydrology

The area is periodically inundated or saturated within the upper 12 inches by subsurface and surface water flow. This area has had significant disturbance to hydrology from surface ditching. Based on aerial photography, evidence of alterations exists during the 1930's with evidence of ditching existing much earlier.

The hydrologic indicators still persist in most instances, even though the surface ditches were removing at least a portion of the hydrology. For the most part, the presence of secondary indicators were sufficient in verifying hydrology. The most common verifiable indicators were oxidized rhizospheres in the upper twelve inches and local soil survey data showing that these areas were mapped as hydric soils. Although there was no standing water present at the time of this investigation, there was evidence that water ponds within portions of the bottomlands as seen in evidence of drift patterns and vegetation patterns. Area 1 is hydrologically sustained via subsurface "seeps" and surface water from upslope. These hydrological sources are fairly consistent along the northern boundary of Area 1 emerging at a consistent elevation along the face of the slope. To a lesser degree, surface runoff and flooding of Lower Cove Run may inundate this area during flooding and provide at least secondary sources of hydrology.

## Soils

Soils were described using four (TP1-TP4) test pits. The soils identified include Me - Melvin Silt Loam and Du - Dunning Silty Clay Loam. Due to extended dry period, only one test pit exhibits standing water near the surface of the pit. Drainage classifications ranged from Poor to Very Poorly Drained. As one would expect the better drained soils were found in closer proximity to Lower Cove Run or further upslope. The exception to this generalization is along the boundaries of the seep areas and within ancient stream meanders along the floodplain. (See the description of areas 2 through 5.)

The soils in Area 1 exhibited a high or perched water table. All the described soil types within the boundary of Area 1 exhibited the F3 Hydric Soils Indicator which is described as:

*"A layer with a depleted matrix that has 60% or more chroma of 2 or less starting within 12 inches (30 cm) of the soil surface that has a minimum thickness of either:*

- a. 6 inches (15cm)*
- b. 2 inches (5 cm) if the 2 inches consist of fragmented soil material*

*The layer(s) above the depleted matrix have value 3 or less and chroma 2 or less."*

However, not all areas mapped in the Local Soil Survey as Me – Melvin or Du – Dunning exhibited hydric characteristics and did not fit other hydric indicators.

## **Areas 2 through 6 Including TP-5 and TP-6**

### **General**

These areas comprise a total of 0.93 acres. The area starts at the southwest end of the construction limit boundary and continues eastward along the floodplain of Lower Cove Run. Distances from the stream range from a few feet to approximately 300 feet.

These areas are narrow, relatively small in size (<0.66 acres) and appear to be non-functional abandoned stream meanders. They have been altered significantly by activities associated with agriculture; and include minor road fills, culverts and very heavy livestock grazing.

### **Vegetation**

The prevalent vegetation consists of macrophytes that are typically adapted to areas having hydrophytic species, due to morphological, physiological and/or reproductive adaptations, have the ability to grow, effectively compete, reproduce and/or persist in anaerobic soil conditions.

The hydrophytic communities that were present in this area were comprised of various densities of *Juncus sp.*, *Carex sp.*, *Scirpus sp.* and domestic forage species. Cattle heavily graze the area. Hydrophytes that emerge are immediately grazed upon. Moisture levels are maintaining succulent growth during the current dry period and concentrating grazing in these areas. Overgrazing is so severe that much of Area 2, 3 and 5 is bare ground and compacted soil. No tree or shrub layers are present within these stream meanders except for occasional *Rosa multiflora*. Occasional trees such as *Juglans nigra* did occur above the meanders on old "streambanks".

The percentage of hydrophytic vegetation in the TPs within the described boundaries range from 0 - 83% using the 50/20 Rule. According to the Corps of Engineers Wetland Delineation Manual, at least 50% of the vegetation must be hydrophytic for the area in question to be considered a wetland. Nonetheless, all outlined areas were considered wetlands due to the presence of hydric soils and wetland hydrology using the procedures in the 1987 ACOE Wetlands Delineation Manual for an Atypical Situation not under Normal Circumstances. Wetland vegetation was significantly disturbed and hydrology has been significantly affected.

### **Hydrology**

These areas are periodically inundated or saturated within the upper 12 inches by subsurface and surface water flow. This area has had significant alteration of hydrology from minor fills associated with agriculture and significant ditching upslope. Based on aerial photography, evidence of alterations exists during the 1930's with the high probability of alterations existing much earlier.

The hydrologic indicators were still evident in most instances, even though the surface ditches were affecting the hydrology. Although there was no standing water present at the time of this investigation, there was evidence that water ponds within portions of the bottomlands as seen in evidence of drift and vegetation patterns. These were documented as evidence of a primary indicator of hydrology. The most common verifiable secondary indicators were oxidized rhizospheres in the upper twelve inches and local soil survey data. These areas are hydrologically sustained by perched water tables high in the soil profile. Surface runoff and

flooding of Lower Cove Run may inundate this area during flooding and provide primary and secondary sources of hydrology from the adjacent stream (floodplain wetlands).

## Soils

Soils were described using two (TP5-TP6) separate test pits. The soils identified include Pt - Potomac Cobbly Loam and Ta - Tioga Fine Sandy Loam. Drainage classifications are listed as Somewhat Excessively Drained and Well Drained respectively. These soils contained inclusions of silt loams that exhibited hydric characteristics and are found within the abandoned stream channels but generally did not extend beyond the bottoms of the old meanders.

The described soils exhibited a high water table and proved to be among the wettest soils examined. All the described soil types within the boundaries of Areas 2 - 6 exhibited the F3 Hydric Soils Indicator which is described as:

*“A layer with a depleted matrix that has 60% or more chroma of 2 or less starting within 12 inches (30 cm) of the soil surface that has a minimum thickness of either:*

- a. 6 inches (15cm)*
- b. 2 inches (5 cm) if the 2 inches consist of fragmented soil material*

*The layer(s) above the depleted matrix have value 3 or less and chroma 2 or less.”*

## Area 7 and 8 Including TP-7

### General

These areas comprise a total acreage of 0.43 acres. These areas are located at the north central region of the construction limit boundary. They consist of two distinct areas fed exclusively by subsurface water (seeps). They have been altered by activities associated with agriculture including ditching and livestock grazing.

### Vegetation

The prevalent vegetation consists of macrophytes that are typically adapted to areas having hydrophytic species, due to morphological, physiological and/or reproductive adaptations, have the ability to grow, effectively compete, reproduce and/or persist in anaerobic soil conditions.

These hydrophytic communities were more diverse and were only somewhat disturbed by periodic grazing. They were also upslope and were somewhat less affected by ditches. These two areas are comprised of various species in three strata (Tree, Shrub and Herbaceous layers). Dominant hydrophytic species include *Juncus sp.*, *Polygonum sp.*, *Acer rubrum*, *Solidago sp.* and *Carex sp.*

The percentage of hydrophytic vegetation in the TPs within these boundaries range from 0 - 67% using the 50/20 Rule. These communities meet the criteria outlined in the 1987 ACOE Wetlands Delineation Manual. All identified areas were considered wetlands due to the presence of hydric soils a predominance of hydrophytic vegetation and wetland hydrology using the procedures in the 1987 ACOE Wetland Delineation Manual for an Atypical Situation not under Normal Circumstances.

## Hydrology

These areas are the upslope points from where subsurface water emerges. They are periodically inundated or saturated within the upper 12 inches by subsurface water flow. Significant effort has been made to divert or drain these areas over time.

The hydrologic indicators were still evident, even though the surface ditches were removing a portion of the hydrology. Ditches are clearly evident on aerial photography. The soils were saturated in the upper 12 inches. This was documented as evidence of a primary indicator of hydrology. The verifiable secondary indicators were oxidized rhizospheres in the upper twelve inches and local soil survey data. Both areas are hydrologically sustained by perched water tables high in the soil profile.

## Soils

Soils were described using a test pit (TP7). The soils were identified as CIC - Clarksburg Stony Silt Loam on 3-15% slopes. Drainage classification is listed as Moderately Well Drained. This soil contains hydric inclusions.

This soil exhibits a high water table and proved to be extremely wet. Both areas 7 and 8 exhibited the F3 Hydric Soils Indicator which is described as:

*“A layer with a depleted matrix that has 60% or more chroma of 2 or less starting within 12 inches (30 cm) of the soil surface that has a minimum thickness of either:*

- a. 6 inches (15cm)*
- b. 2 inches (5 cm) if the 2 inches consist of fragmented soil material*

*The layer(s) above the depleted matrix have value 3 or less and chroma 2 or less.”*

## SUMMARY & CONCLUSIONS

A total of 25.65 acres of wetlands were delineated using the 1987 ACOE Wetland Delineation Manual using the criteria for Atypical Situations not occurring under Normal Circumstances (see Table 1 below). These areas have had significant disturbance over a long period of time, have remained in agriculture and have not been abandoned.

Although these areas still exhibit the basic wetland parameters as described in this document, the functionality of these areas is minimal at best. Due to historical and current management practices, landuse, the alteration to natural hydrologic regimes and removal of vegetative communities, these wetlands provide very little functionality in terms of wildlife value, water quality, flood storage or groundwater recharge. A recognized functionality assessment could be used to fully assess the condition of the identified areas, however this is not recommended. Restoration of any functionality to these wetlands would require the removal of fill, filling of ditches and cessation of current management.

<b>GEOMORPHIC SETTING</b>	<b>WETLANDS</b>	<b>AREA DELINEATED (acres)</b>	<b>TOTAL (acres)</b>
Bottomland	Area 1	24.53	24.53
Abandoned Stream Meanders	Area 2	0.20	0.93
	Area 3	0.04	
	Area 4	0.02	
	Area 5	0.01	
	Area 6	0.66	
Hillside Seeps	Area 7	0.17	0.43
	Area 8	0.26	
Artificial Wetlands (ponds for livestock water)	AW	0.22	---
<b>TOTAL</b>		<b>25.87</b>	<b>25.65*</b>

Table 1 showing the breakdown of areas delineated. Refer to the map entitled "Wetland Delineation". \* Note that the total does not include the 0.22 acres of artificial wetlands (AW)

It should be noted that the Natural Resources Conservation Service (NRCS) frequently refers to these types of wetlands as prior-converted (PC) for USDA program purposes using the authority of the Food Security Act of 1985. Prior-Converted wetlands have no management restrictions as long as they remain in agriculture use and are not abandoned.

In addition, there are areas of wetlands that appear to exist in the area immediately below the proposed emergency spillway. These areas were not delineated as no construction is proposed for that area.

Stream habitat and associated resources were not evaluated in this report. Impacts to Lower Cove Run will be evaluated using other stream assessment protocol in conjunction with regulatory agencies.

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## **APPENDIX**

- A. HYDROLOGIC DATA**
- B. DATA FORMS**
- C. LOCATION MAP**
- D. TOPOGRAPHIC MAP**
- E. NATIONAL WETLAND INVENTORY MAP**
- F. HISTORICAL PHOTOGRAPHY**
- G. SOILS MAP**
- H. WETLAND DELINEATION MAP**
- I. SITE PHOTOGRAPHY**

## **HYDROLOGIC DATA**

# USDA Field Office Climate Data

MOOREFIELD 1 SSE (466163)

Monthly Totals/Averages

Precipitation (inches)

Year: 2007

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2007	0.88	3.02	2.65	3.28	1.54	3.99	3.48	2.64	2.22	0.18	-	-	-

Product generated by ACIS - NOAA Regional Climate Centers.

# USDA Field Office Climate Data

MOOREFIELD 1 SSE (466163)

Observed Daily Data

Month: Oct 2007

Day	Max Temp	Min Temp	Avg Temp	GDD B50	GDD B40	Total Prcpn	New Snow	Snow Depth
1	78	40	59.0	9	19	0.00	M	M
2	79	40	59.5	10	20	0.00	M	M
3	84	46	65.0	15	25	0.00	M	M
4	88	49	68.5	19	29	0.00	M	M
5	88	48	68.0	18	28	0.00	M	M
6	87	53	70.0	20	30	0.00	M	M
7	M	M	M	M	M	M	M	M
8	90	53	71.5	22	32	0.02	0.0	0
9	90	57	73.5	24	34	0.00	M	M
10	88	50	69.0	19	29	0.16	M	M
11	79	49	64.0	14	24	0.00	M	M
12	58	49	53.5	4	14	0.00	M	M
13	61	41	51.0	1	11	0.00	M	M
14	M	M	M	M	M	M	M	M
15	69	33	51.0	1	11	0.00	M	M
16	75	37	56.0	6	16	0.00	M	M
17	81	42	61.5	12	22	0.00	M	M
18	83	48	65.5	16	26	0.00	M	M
19	83	51	67.0	17	27	0.00	M	M
20	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M	M	M
22	82	38	60.0	10	20	0.00	M	M
23	83	38	60.5	11	21	0.00	M	M
24	M	M	M	M	M	M	M	M
25	M	M	M	M	M	M	M	M
26	M	M	M	M	M	M	M	M
27	M	M	M	M	M	M	M	M
28	M	M	M	M	M	M	M	M
29	M	M	M	M	M	M	M	M
30	M	M	M	M	M	M	M	M
31	M	M	M	M	M	M	M	M
Smry	80.3	45.4	62.8	248	438	0.18	0.0	0.0

Product generated by ACIS - NOAA Regional Climate Centers.

# USDA Field Office Climate Data

WARDENSVILLE RM FARM (469281)

Monthly Totals/Averages

Precipitation (inches)

Year: 2007

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2007	1.12	2.14	2.60	3.27	1.30	4.22	1.83	5.72	1.00	0.42	-	-	-

Product generated by ACIS - NOAA Regional Climate Centers.

# USDA Field Office Climate Data

WARDENSVILLE RM FARM (469281)

Observed Daily Data

Month: Oct 2007

Day	Max Temp	Min Temp	Avg Temp	GDD B50	GDD B40	Total Prcpn	New Snow	Snow Depth
1	74	37	55.5	6	16	0.00		
2	77	41	59.0	9	19	0.00		
3	81	44	62.5	13	23	0.00		
4	86	47	66.5	17	27	0.00		
5	89	53	71.0	21	31	0.00		
6	M	M	M	M	M	M		
7	M	M	M	M	M	M		
8	89	54	71.5	22	32	0.03		
9	90	58	74.0	24	34	0.00		
10	88	50	69.0	19	29	0.31		
11	80	46	63.0	13	23	0.00		
12	58	44	51.0	1	11	0.08		
13	M	M	M	M	M	M		
14	63	33	48.0	0	8	0.00		
15	69	34	51.5	2	12	0.00		
16	75	37	56.0	6	16	0.00		
17	77	42	59.5	10	20	0.00		
18	M	M	M	M	M	M		
19	M	M	M	M	M	M		
20	M	M	M	M	M	M		
21	M	M	M	M	M	M		
22	M	M	M	M	M	M		
23	M	M	M	M	M	M		
24	M	M	M	M	M	M		
25	M	M	M	M	M	M		
26	M	M	M	M	M	M		
27	M	M	M	M	M	M		
28	M	M	M	M	M	M		
29	M	M	M	M	M	M		
30	M	M	M	M	M	M		
31	M	M	M	M	M	M		

Smry 78.3 44.3 61.3 163 301 0.42

Product generated by ACIS - NOAA Regional Climate Centers.

Month	Temperature (Degrees F.)			Precipitation (Inches)				
	avg daily max	avg daily min	avg	avg	30% chance will have		avg	avg
					less than	more than	# of days w/.1 or more	total snow fall
January	42.5	21.3	31.9	1.99	1.14	2.39	5	9.3
February	47.0	23.8	35.4	1.75	0.91	2.07	4	5.2
March	56.7	31.1	43.9	2.54	1.50	3.05	5	4.0
April	67.6	39.2	53.4	2.33	1.42	2.71	5	0.4
May	76.5	49.4	62.9	3.59	2.66	4.24	8	0.0
June	84.1	57.9	71.0	3.38	2.39	4.12	7	0.0
July	87.3	61.7	74.5	3.63	2.33	4.50	7	0.0
August	85.9	60.2	73.1	3.47	2.57	4.02	7	0.0
September	79.7	53.5	66.6	2.92	1.58	3.72	5	0.0
October	69.6	41.5	55.6	2.57	1.14	3.19	4	0.0
November	57.1	32.9	45.0	2.51	1.51	3.10	4	1.0
December	46.5	25.5	36.0	1.93	1.18	2.42	4	3.4
Annual	-----	-----	-----	-----	29.10	34.35	--	----
Average	66.7	41.5	54.1	-----	-----	-----	--	----
Total	-----	-----	-----	32.63	-----	-----	65	23.3

GROWING SEASON DATES

Probability	Temperature		
	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	4/ 3 to 10/30 211 days	4/16 to 10/18 185 days	4/30 to 10/ 9 162 days
70 percent *	3/30 to 11/ 4 219 days	4/13 to 10/21 192 days	4/26 to 10/12 169 days

\* Percent chance of the growing season occurring between the Beginning and Ending dates.

total 1948-2002 prcp

TAPS Station : MOOREFIELD 2 SSE, WV6163

Start yr. - 1971 End yr. - 2000

Temperature: 30 years available out of 30 requested in this analysis

Precipitation: 30 years available out of 30 requested in this analysis

Month	Temperature (Degrees F.)						Precipitation (Inches)					
				2 yrs in 10						2 yrs in 10		avg
	avg	avg	avg	max	min	grow	avg	less	more	# of	avg	
daily	daily		temp.	temp.	deg		than	than	days	total		
max	min		>than	<than	days*				or	fall		
									more			
January	42.5	21.3	31.9	70	-9	39	1.99	0.89	2.92	5	9.3	
February	47.0	23.8	35.4	75	-3	64	1.75	0.70	2.62	4	5.2	
March	56.7	31.1	43.9	84	7	190	2.54	1.19	3.72	5	4.0	
April	67.6	39.2	53.4	89	20	408	2.33	1.16	3.28	5	0.4	
May	76.5	49.4	62.9	92	29	711	3.59	2.28	4.81	8	0.0	
June	84.1	57.9	71.0	95	40	930	3.38	1.97	4.72	7	0.0	
July	87.3	61.7	74.5	98	46	1068	3.63	1.85	5.31	7	0.0	
August	85.9	60.2	73.1	97	44	1024	3.47	2.23	4.58	7	0.0	
September	79.7	53.5	66.6	94	33	797	2.92	1.14	4.54	5	0.0	
October	69.6	41.5	55.6	88	21	483	2.57	0.80	4.14	4	0.0	
November	57.1	32.9	45.0	80	12	203	2.51	1.17	3.73	4	1.0	
December	46.5	25.5	36.0	73	2	71	1.93	0.91	2.90	4	3.4	
Yearly :												
Average	66.7	41.5	54.1	---	---	---	---	---	---	---	---	
Extreme	106	-20	---	99	-12	---	---	---	---	---	---	
Total	---	---	---	---	---	5988	32.63	27.84	36.35	65	23.3	

Average # of days per year with at least 1 inch of snow on the ground: 12

\*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold : 40.0 deg. F)

WETS Station : WARDENSVILLE R M FARM, WV9281      Creation Date: 10/24/2002  
 Latitude: 3906      Longitude: 07835      Elevation: 960  
 State FIPS/County(FIPS): 54031      County Name: Hardy  
 Start yr. - 1971      End yr. - 2000

Month	Temperature (Degrees F.)			Precipitation (Inches)				
	avg daily max	avg daily min	avg	avg	30% chance will have		avg	avg
					less than	more than	# of days w/.1 or more	total snow fall
January	40.9	18.5	29.7	2.31	1.35	2.79	5	8.7
February	44.3	20.7	32.5	2.01	1.05	2.49	4	6.4
March	53.2	28.3	40.8	2.82	1.81	3.26	6	4.9
April	63.9	36.8	50.3	2.73	1.68	3.17	6	0.6
May	73.3	46.6	60.0	3.55	2.41	4.50	7	0.0
June	81.5	55.6	68.5	3.43	2.45	4.18	6	0.0
July	85.6	60.0	72.8	3.58	2.48	4.13	7	0.0
August	84.0	58.1	71.1	3.48	2.47	4.10	6	0.0
September	77.7	50.7	64.2	3.26	1.67	3.68	5	0.0
October	66.9	38.0	52.4	3.00	1.60	3.77	5	0.0
November	55.8	30.6	43.2	2.93	1.80	3.56	5	1.5
December	45.2	23.1	34.2	2.18	1.56	3.00	4	4.1
Annual	-----	-----	-----	-----	31.48	37.34	--	-----
Average	64.4	38.9	51.6	-----	-----	-----	--	-----
Total	-----	-----	-----	35.29	-----	-----	66	26.3

GROWING SEASON DATES

Probability	Temperature		
	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	4/ 6 to 10/26 202 days	4/22 to 10/16 176 days	5/ 3 to 10/ 5 155 days
70 percent *	4/ 2 to 10/30 211 days	4/18 to 10/19 184 days	4/29 to 10/ 9 162 days

\* Percent chance of the growing season occurring between the Beginning and Ending dates.

TAPS Station : WARDENSVILLE R M FARM, WV9281

Start yr. - 1971 End yr. - 2000

Temperature: 30 years available out of 30 requested in this analysis

Precipitation: 30 years available out of 30 requested in this analysis

Month	Temperature (Degrees F.)						Precipitation (Inches)				
				2 yrs in 10			2 yrs in 10			avg	
				will have			will have			# of	avg
	avg	avg	avg	max	min	grow	avg	less	more	w/.1	snow
daily	daily		temp.	temp.	deg		than	than	or	fall	
max	min		>than	<than	days*				more		
January	40.9	18.5	29.7	70	-10	25	2.31	1.07	3.39	5	8.7
February	44.3	20.7	32.5	73	-3	40	2.01	0.77	3.10	4	6.4
March	53.2	28.3	40.8	81	7	134	2.82	1.52	3.89	6	4.9
April	63.9	36.8	50.3	87	19	320	2.73	1.38	3.83	6	0.6
May	73.3	46.6	60.0	91	28	614	3.55	1.89	5.20	7	0.0
June	81.5	55.6	68.5	94	38	850	3.43	2.02	4.78	6	0.0
July	85.6	60.0	72.8	98	44	1011	3.58	2.13	4.81	7	0.0
August	84.0	58.1	71.1	97	42	957	3.48	2.10	4.72	6	0.0
September	77.7	50.7	64.2	94	32	722	3.26	1.32	4.70	5	0.0
October	66.9	38.0	52.4	86	20	382	3.00	1.17	4.66	5	0.0
November	55.8	30.6	43.2	80	13	162	2.93	1.43	4.27	5	1.5
December	45.2	23.1	34.2	72	2	50	2.18	1.09	3.26	4	4.1
Yearly :											
Average	64.4	38.9	51.6	---	---	---	---	---	---	---	---
Extreme	105	-17	---	99	-11	---	---	---	---	---	---
Total	---	---	---	---	---	5267	35.29	30.11	39.62	66	26.3

Average # of days per year with at least 1 inch of snow on the ground: 16

\*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold : 40.0 deg. F)

TAPS Station : MOOREFIELD 2 SSE, WV6163

Start yr. - 1971 End yr. - 2000

Temperature: 30 years available out of 30 requested in this analysis

Precipitation: 30 years available out of 30 requested in this analysis

Month	Temperature (Degrees F.)						Precipitation (Inches)					
				2 yrs in 10						2 yrs in 10		avg
	avg	avg	avg	max	min	grow	avg	less	more	# of	avg	
daily	daily		temp.	temp.	deg		than	than	days	total		
max	min		>than	<than	days*				or	fall		
									more			
January	42.5	21.3	31.9	70	-9	39	1.99	0.89	2.92	5	9.3	
February	47.0	23.8	35.4	75	-3	64	1.75	0.70	2.62	4	5.2	
March	56.7	31.1	43.9	84	7	190	2.54	1.19	3.72	5	4.0	
April	67.6	39.2	53.4	89	20	408	2.33	1.16	3.28	5	0.4	
May	76.5	49.4	62.9	92	29	711	3.59	2.28	4.81	8	0.0	
June	84.1	57.9	71.0	95	40	930	3.38	1.97	4.72	7	0.0	
July	87.3	61.7	74.5	98	46	1068	3.63	1.85	5.31	7	0.0	
August	85.9	60.2	73.1	97	44	1024	3.47	2.23	4.58	7	0.0	
September	79.7	53.5	66.6	94	33	797	2.92	1.14	4.54	5	0.0	
October	69.6	41.5	55.6	88	21	483	2.57	0.80	4.14	4	0.0	
November	57.1	32.9	45.0	80	12	203	2.51	1.17	3.73	4	1.0	
December	46.5	25.5	36.0	73	2	71	1.93	0.91	2.90	4	3.4	
Yearly :												
Average	66.7	41.5	54.1	---	---	---	---	---	---	---	---	
Extreme	106	-20	---	99	-12	---	---	---	---	---	---	
Total	---	---	---	---	---	5988	32.63	27.84	36.35	65	23.3	

Average # of days per year with at least 1 inch of snow on the ground: 12

\*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold : 40.0 deg. F)

## **DATA FORMS**

**DATA FORM**

**ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

Project/Site	Date
Applicant / Owner	County
Investigator	State
Do Normal Circumstances exist on the site? YES NO	Community ID
Is the site significantly disturbed (Atypical Situation)? YES NO	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES NO	Plot ID

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1			9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-)					
Remarks					

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe in Remarks) <ul style="list-style-type: none"> <li><input type="checkbox"/> Stream, Lake, or Tide Gauge</li> <li><input type="checkbox"/> Aerial Photographs</li> <li><input type="checkbox"/> Other</li> </ul> <input type="checkbox"/> No Recorded Data Available		<p align="center"><b>WETLAND HYDROLOGY INDICATORS</b></p> Primary Indicators: <ul style="list-style-type: none"> <li><input type="checkbox"/> Inundated</li> <li><input type="checkbox"/> Saturated in Upper 12 Inches</li> <li><input type="checkbox"/> Water Marks</li> <li><input type="checkbox"/> Drift Lines</li> <li><input type="checkbox"/> Sediment Deposits</li> <li><input type="checkbox"/> Drainage Patterns in Wetlands</li> </ul> Secondary Indicators (2 or more Required): <ul style="list-style-type: none"> <li><input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</li> <li><input type="checkbox"/> Water-Stained Leaves</li> <li><input type="checkbox"/> Local Soil Survey Data</li> <li><input type="checkbox"/> FAC-Neutral Test</li> <li><input type="checkbox"/> Other (Explain in Remarks)</li> </ul>	
<b>FIELD OBSERVATIONS</b>			
Depth of Surface Water		(in)	
Depth to Free Water in Pit		(in)	
Depth to Saturated Soil		(in)	

# SOILS

Map Unit Name (Series and Phase):				Drainage Class:	
Taxonomy (Subgroup)			Field Observations Confirm Mapped Type?    YES    NO		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks:					

## WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES    NO	Is this Sampling Point Within a Wetland?    YES    NO
Wetland Hydrology Present?	YES    NO	
Hydric Soils Present?	YES    NO	
Remarks		

**DATA FORM**

**ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

Project/Site	Date
Applicant / Owner	County
Investigator	State
Do Normal Circumstances exist on the site? YES NO	Community ID
Is the site significantly disturbed (Atypical Situation)? YES NO	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES NO	Plot ID

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1			9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-)

Remarks

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe in Remarks) <ul style="list-style-type: none"> <li><input type="checkbox"/> Stream, Lake, or Tide Gauge</li> <li><input type="checkbox"/> Aerial Photographs</li> <li><input type="checkbox"/> Other</li> </ul> <input type="checkbox"/> No Recorded Data Available	<p align="center"><b>WETLAND HYDROLOGY INDICATORS</b></p> <p>Primary Indicators:</p> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands
<b>FIELD OBSERVATIONS</b>	
Depth of Surface Water	(in)
Depth to Free Water in Pit	(in)
Depth to Saturated Soil	(in)
	<p>Secondary Indicators (2 or more Required):</p> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)

# SOILS

Map Unit Name (Series and Phase):				Drainage Class:	
Taxonomy (Subgroup)			Field Observations Confirm Mapped Type?    YES    NO		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks:					

## WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES    NO	Is this Sampling Point Within a Wetland?    YES    NO
Wetland Hydrology Present?	YES    NO	
Hydric Soils Present?	YES    NO	
Remarks		

**DATA FORM**

**ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

Project/Site	Date
Applicant / Owner	County
Investigator	State
Do Normal Circumstances exist on the site? YES NO	Community ID
Is the site significantly disturbed (Atypical Situation)? YES NO	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES NO	Plot ID

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1			9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-)

Remarks

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe in Remarks) <ul style="list-style-type: none"> <li><input type="checkbox"/> Stream, Lake, or Tide Gauge</li> <li><input type="checkbox"/> Aerial Photographs</li> <li><input type="checkbox"/> Other</li> </ul> <input type="checkbox"/> No Recorded Data Available	<p align="center"><b>WETLAND HYDROLOGY INDICATORS</b></p> <p>Primary Indicators:</p> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands
<b>FIELD OBSERVATIONS</b>	
Depth of Surface Water	(in)
Depth to Free Water in Pit	(in)
Depth to Saturated Soil	(in)
	<p>Secondary Indicators (2 or more Required):</p> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)

# SOILS

Map Unit Name (Series and Phase):				Drainage Class:	
Taxonomy (Subgroup)			Field Observations Confirm Mapped Type?    YES    NO		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks:					

## WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES    NO	Is this Sampling Point Within a Wetland?    YES    NO
Wetland Hydrology Present?	YES    NO	
Hydric Soils Present?	YES    NO	
Remarks		

**DATA FORM**

**ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

Project/Site	Date
Applicant / Owner	County
Investigator	State
Do Normal Circumstances exist on the site? YES NO	Community ID
Is the site significantly disturbed (Atypical Situation)? YES NO	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES NO	Plot ID

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1			9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-)					
Remarks					

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe in Remarks) <ul style="list-style-type: none"> <li><input type="checkbox"/> Stream, Lake, or Tide Gauge</li> <li><input type="checkbox"/> Aerial Photographs</li> <li><input type="checkbox"/> Other</li> </ul> <input type="checkbox"/> No Recorded Data Available		<p align="center"><b>WETLAND HYDROLOGY INDICATORS</b></p> Primary Indicators: <ul style="list-style-type: none"> <li><input type="checkbox"/> Inundated</li> <li><input type="checkbox"/> Saturated in Upper 12 Inches</li> <li><input type="checkbox"/> Water Marks</li> <li><input type="checkbox"/> Drift Lines</li> <li><input type="checkbox"/> Sediment Deposits</li> <li><input type="checkbox"/> Drainage Patterns in Wetlands</li> </ul> Secondary Indicators (2 or more Required): <ul style="list-style-type: none"> <li><input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</li> <li><input type="checkbox"/> Water-Stained Leaves</li> <li><input type="checkbox"/> Local Soil Survey Data</li> <li><input type="checkbox"/> FAC-Neutral Test</li> <li><input type="checkbox"/> Other (Explain in Remarks)</li> </ul>	
<b>FIELD OBSERVATIONS</b>			
Depth of Surface Water		(in)	
Depth to Free Water in Pit		(in)	
Depth to Saturated Soil		(in)	

# SOILS

Map Unit Name (Series and Phase):				Drainage Class:	
Taxonomy (Subgroup)			Field Observations Confirm Mapped Type?    YES    NO		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks:					

## WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES    NO	Is this Sampling Point Within a Wetland?    YES    NO
Wetland Hydrology Present?	YES    NO	
Hydric Soils Present?	YES    NO	
Remarks		

**DATA FORM**

**ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

Project/Site	Date
Applicant / Owner	County
Investigator	State
Do Normal Circumstances exist on the site? YES NO	Community ID
Is the site significantly disturbed (Atypical Situation)? YES NO	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES NO	Plot ID

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1			9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-)

Remarks

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe in Remarks) <ul style="list-style-type: none"> <li><input type="checkbox"/> Stream, Lake, or Tide Gauge</li> <li><input type="checkbox"/> Aerial Photographs</li> <li><input type="checkbox"/> Other</li> </ul> <input type="checkbox"/> No Recorded Data Available	<p align="center"><b>WETLAND HYDROLOGY INDICATORS</b></p> <p>Primary Indicators:</p> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands
<b>FIELD OBSERVATIONS</b>	
Depth of Surface Water	(in)
Depth to Free Water in Pit	(in)
Depth to Saturated Soil	(in)
	<p>Secondary Indicators (2 or more Required):</p> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)

# SOILS

Map Unit Name (Series and Phase):				Drainage Class:	
Taxonomy (Subgroup)			Field Observations Confirm Mapped Type?    YES    NO		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks:					

## WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES    NO	Is this Sampling Point Within a Wetland?    YES    NO
Wetland Hydrology Present?	YES    NO	
Hydric Soils Present?	YES    NO	
Remarks		

**DATA FORM**

**ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

Project/Site	Date
Applicant / Owner	County
Investigator	State
Do Normal Circumstances exist on the site? YES NO	Community ID
Is the site significantly disturbed (Atypical Situation)? YES NO	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES NO	Plot ID

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1			9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-)					
Remarks					

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe in Remarks) <ul style="list-style-type: none"> <li><input type="checkbox"/> Stream, Lake, or Tide Gauge</li> <li><input type="checkbox"/> Aerial Photographs</li> <li><input type="checkbox"/> Other</li> </ul> <input type="checkbox"/> No Recorded Data Available		<p align="center"><b>WETLAND HYDROLOGY INDICATORS</b></p> Primary Indicators: <ul style="list-style-type: none"> <li><input type="checkbox"/> Inundated</li> <li><input type="checkbox"/> Saturated in Upper 12 Inches</li> <li><input type="checkbox"/> Water Marks</li> <li><input type="checkbox"/> Drift Lines</li> <li><input type="checkbox"/> Sediment Deposits</li> <li><input type="checkbox"/> Drainage Patterns in Wetlands</li> </ul> Secondary Indicators (2 or more Required): <ul style="list-style-type: none"> <li><input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</li> <li><input type="checkbox"/> Water-Stained Leaves</li> <li><input type="checkbox"/> Local Soil Survey Data</li> <li><input type="checkbox"/> FAC-Neutral Test</li> <li><input type="checkbox"/> Other (Explain in Remarks)</li> </ul>	
<b>FIELD OBSERVATIONS</b>			
Depth of Surface Water		(in)	
Depth to Free Water in Pit		(in)	
Depth to Saturated Soil		(in)	

# SOILS

Map Unit Name (Series and Phase):				Drainage Class:	
Taxonomy (Subgroup)			Field Observations Confirm Mapped Type?    YES    NO		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks:					

## WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES    NO	Is this Sampling Point Within a Wetland?    YES    NO
Wetland Hydrology Present?	YES    NO	
Hydric Soils Present?	YES    NO	
Remarks		

**DATA FORM**

**ROUTINE WETLAND DETERMINATION  
(1987 COE Wetlands Delineation Manual)**

Project/Site	Date
Applicant / Owner	County
Investigator	State
Do Normal Circumstances exist on the site? YES NO	Community ID
Is the site significantly disturbed (Atypical Situation)? YES NO	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES NO	Plot ID

**VEGETATION**

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1			9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-)					
Remarks					

**HYDROLOGY**

<input type="checkbox"/> Recorded Data (Describe in Remarks) <ul style="list-style-type: none"> <li><input type="checkbox"/> Stream, Lake, or Tide Gauge</li> <li><input type="checkbox"/> Aerial Photographs</li> <li><input type="checkbox"/> Other</li> </ul> <input type="checkbox"/> No Recorded Data Available	<p align="center"><b>WETLAND HYDROLOGY INDICATORS</b></p> <p>Primary Indicators:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Inundated</li> <li><input type="checkbox"/> Saturated in Upper 12 Inches</li> <li><input type="checkbox"/> Water Marks</li> <li><input type="checkbox"/> Drift Lines</li> <li><input type="checkbox"/> Sediment Deposits</li> <li><input type="checkbox"/> Drainage Patterns in Wetlands</li> </ul> <p>Secondary Indicators (2 or more Required):</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</li> <li><input type="checkbox"/> Water-Stained Leaves</li> <li><input type="checkbox"/> Local Soil Survey Data</li> <li><input type="checkbox"/> FAC-Neutral Test</li> <li><input type="checkbox"/> Other (Explain in Remarks)</li> </ul>
<b>FIELD OBSERVATIONS</b>	
Depth of Surface Water	(in)
Depth to Free Water in Pit	(in)
Depth to Saturated Soil	(in)

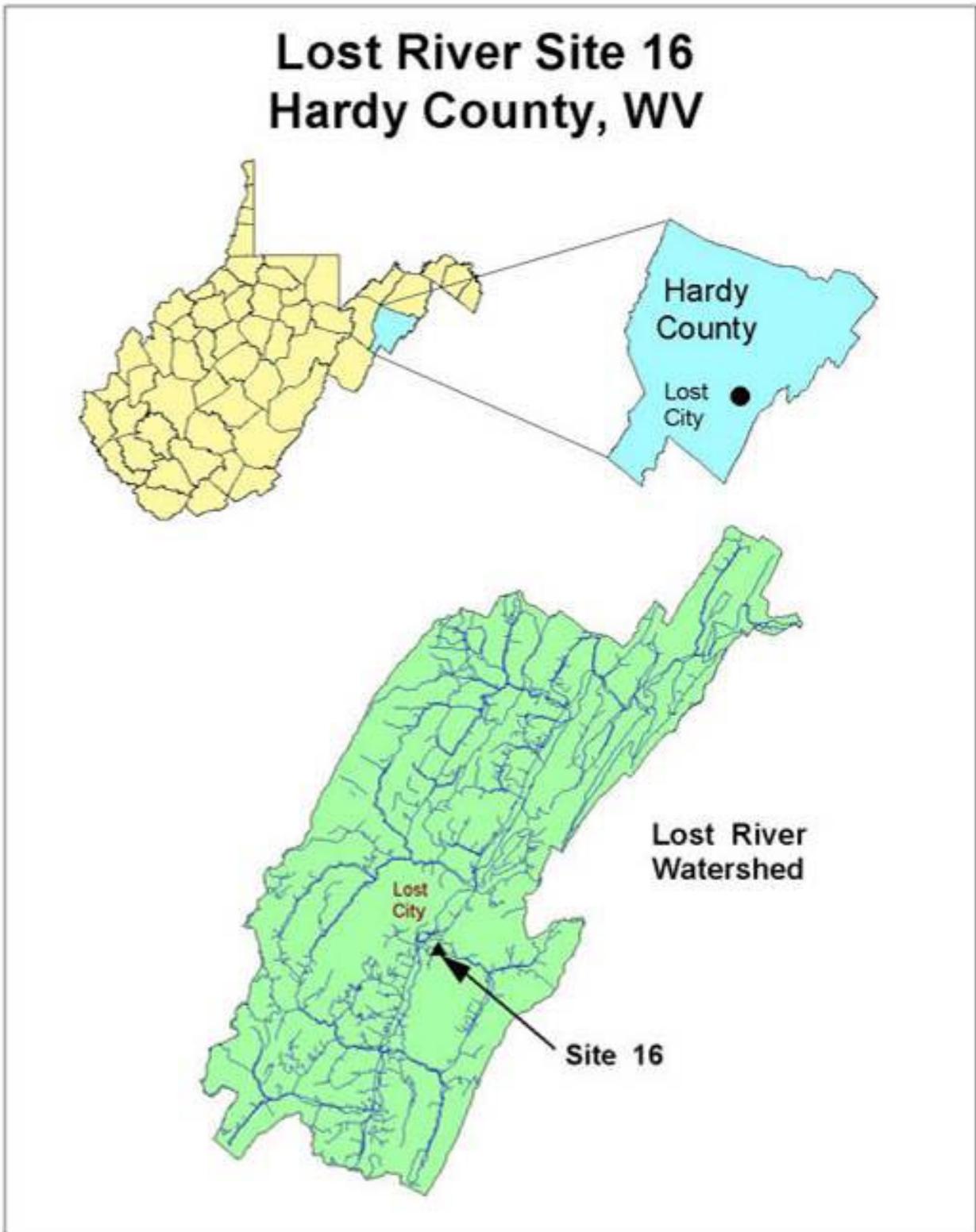
# SOILS

Map Unit Name (Series and Phase):				Drainage Class:	
Taxonomy (Subgroup)			Field Observations Confirm Mapped Type?    YES    NO		
PROFILE DESCRIPTION					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
HYDRIC SOIL INDICATORS:					
<input type="checkbox"/> Histosol		<input type="checkbox"/> Concretions			
<input type="checkbox"/> Histic Epipedon		<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils			
<input type="checkbox"/> Sulfidic Odor		<input type="checkbox"/> Organic Streaking in Sandy Soils			
<input type="checkbox"/> Aquic Moisture Regime		<input type="checkbox"/> Listed on Local Hydric Soils List			
<input type="checkbox"/> Reducing Conditions		<input type="checkbox"/> Listed on National Hydric Soils List			
<input type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Other (Explain in Remarks)			
Remarks:					

## WETLAND DETERMINATION

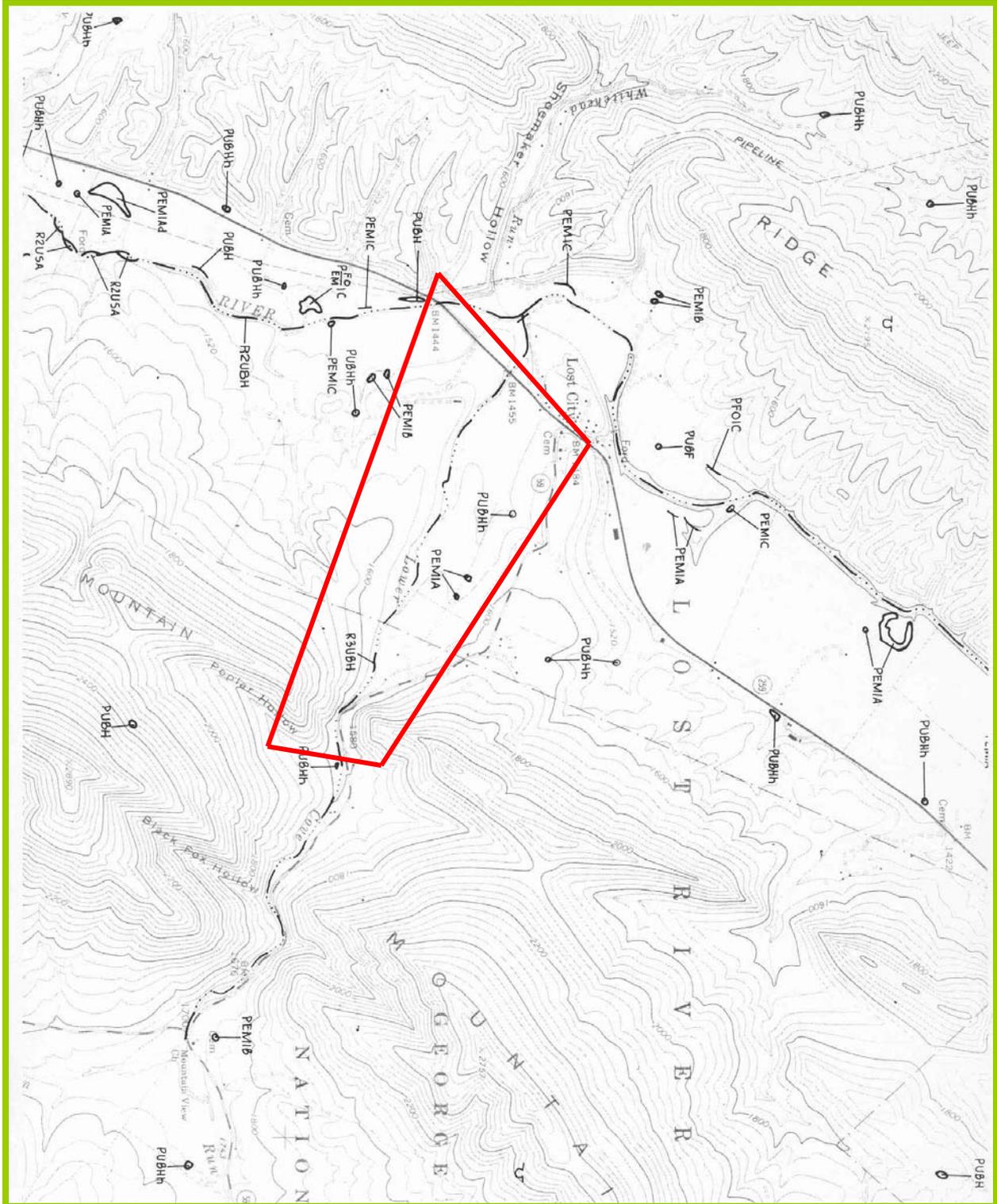
Hydrophytic Vegetation Present?	YES    NO	Is this Sampling Point Within a Wetland?    YES    NO
Wetland Hydrology Present?	YES    NO	
Hydric Soils Present?	YES    NO	
Remarks		

# LOCATION MAP



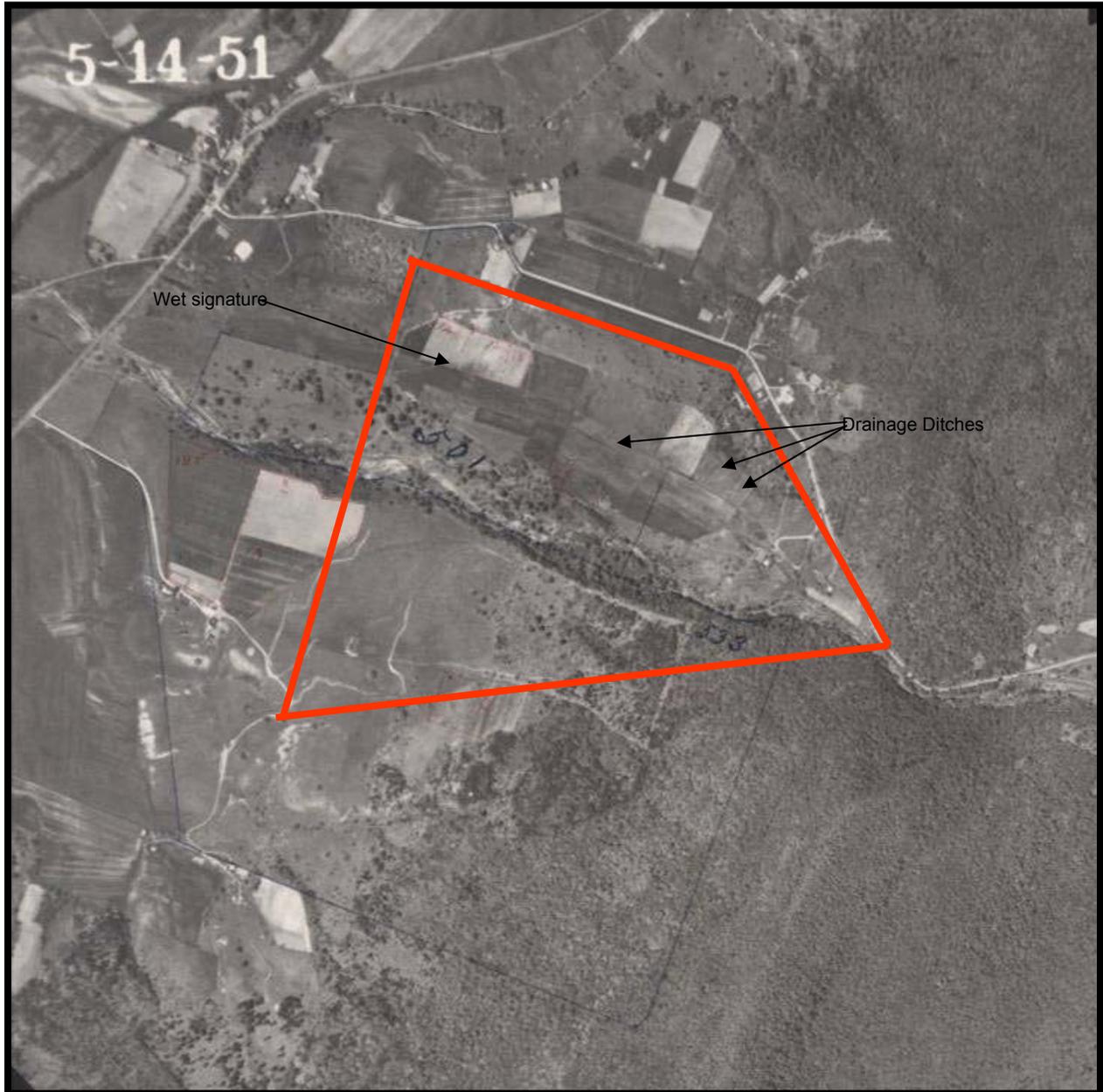


# NATIONAL WETLAND INVENTORY MAPS



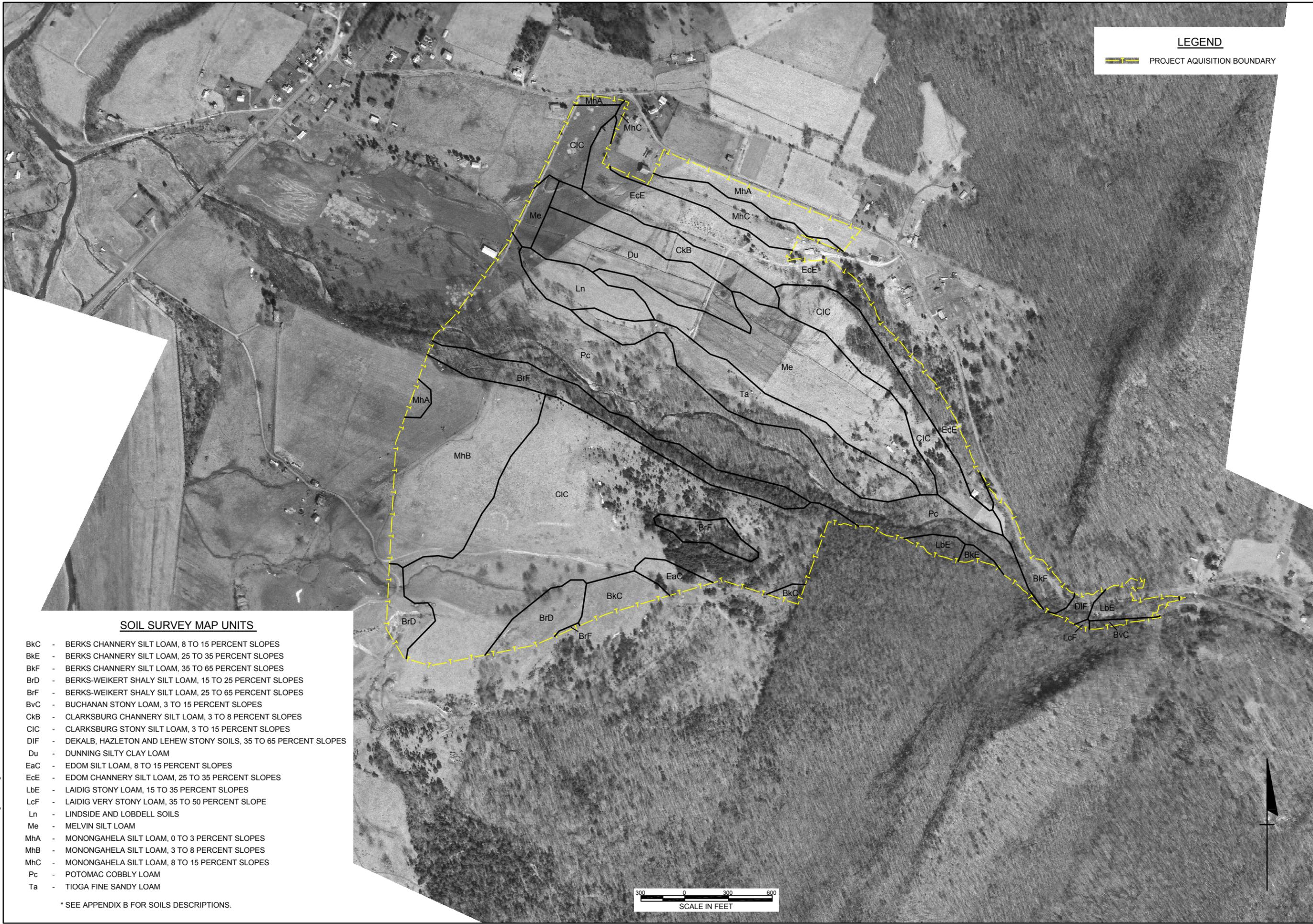
- PUBHh** – palustrine unconsolidated bottom permanently flooded diked/impounded
- PEM1B** – palustrine emergent persistent saturated
- PEM1A** – palustrine emergent persistent temporarily flooded
- R3UBH** – riverine upper perennial unconsolidated bottom permanently flooded

## HISTORICAL PHOTOGRAPHY



*Lost River Site #16 in May of 1951, showing approximate area of this investigation. This photograph shows history of agricultural use and evidence of drainage. Note prominent wet signatures throughout the property. Drainage was evident in aerial photography dating as far back as 1930. Source **FSA Aerial Photograph***

H:\sacadm\2\WORK\Lost River\site16\ron.wigal\soils.dwg



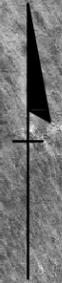
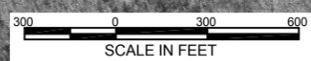
**LEGEND**

 PROJECT ACQUISITION BOUNDARY

**SOIL SURVEY MAP UNITS**

- BkC - BERKS CHANNERY SILT LOAM, 8 TO 15 PERCENT SLOPES
- BkE - BERKS CHANNERY SILT LOAM, 25 TO 35 PERCENT SLOPES
- BkF - BERKS CHANNERY SILT LOAM, 35 TO 65 PERCENT SLOPES
- BrD - BERKS-WEIKERT SHALY SILT LOAM, 15 TO 25 PERCENT SLOPES
- BrF - BERKS-WEIKERT SHALY SILT LOAM, 25 TO 65 PERCENT SLOPES
- BvC - BUCHANAN STONY LOAM, 3 TO 15 PERCENT SLOPES
- CkB - CLARKSBURG CHANNERY SILT LOAM, 3 TO 8 PERCENT SLOPES
- CkC - CLARKSBURG STONY SILT LOAM, 3 TO 15 PERCENT SLOPES
- DIF - DEKALB, HAZLETON AND LEHEW STONY SOILS, 35 TO 65 PERCENT SLOPES
- Du - DUNNING SILTY CLAY LOAM
- EaC - EDOM SILT LOAM, 8 TO 15 PERCENT SLOPES
- EcE - EDOM CHANNERY SILT LOAM, 25 TO 35 PERCENT SLOPES
- LbE - LAIDIG STONY LOAM, 15 TO 35 PERCENT SLOPES
- LcF - LAIDIG VERY STONY LOAM, 35 TO 50 PERCENT SLOPE
- Ln - LINDSIDE AND LOBDELL SOILS
- Me - MELVIN SILT LOAM
- MhA - MONONGAHELA SILT LOAM, 0 TO 3 PERCENT SLOPES
- MhB - MONONGAHELA SILT LOAM, 3 TO 8 PERCENT SLOPES
- MhC - MONONGAHELA SILT LOAM, 8 TO 15 PERCENT SLOPES
- Pc - POTOMAC COBBLY LOAM
- Ta - TIOGA FINE SANDY LOAM

\* SEE APPENDIX B FOR SOILS DESCRIPTIONS.



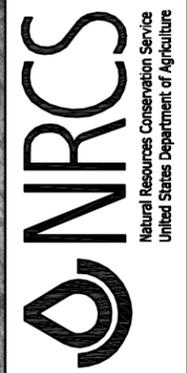
Date	8/2006
Designed	
Drawn	CAD
Checked	
Approved	
Approved	

LOST RIVER SUB-WATERSHED  
OF THE POTOMAC RIVER WATERSHED

**SOIL SURVEY MAP**

MULTIPLE PURPOSE DAM SITE 16

HARDY COUNTY, WEST VIRGINIA



File Name

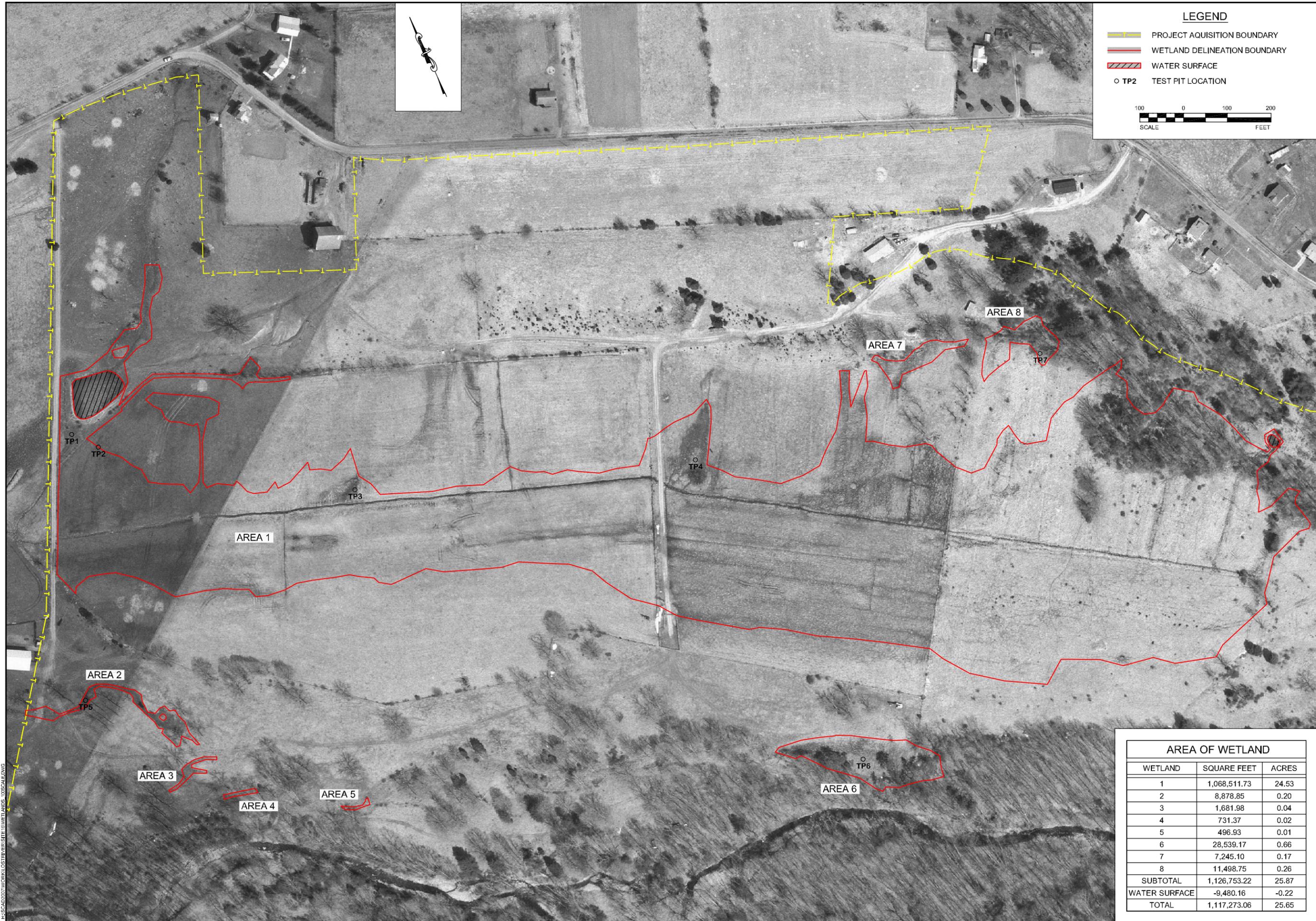
Drawing Name



**LEGEND**

- PROJECT ACQUISITION BOUNDARY
- WETLAND DELINEATION BOUNDARY
- WATER SURFACE
- TP2 TEST PIT LOCATION

100 0 100 200  
SCALE FEET



Date	10/2007
Designed	SHRADER, RIDLEY, BEARD
Drawn	N. KNOX
Checked	
Approved	

LOST RIVER SUB-WATERSHED  
OF THE POTOMAC RIVER WATERSHED  
MULTIPLE PURPOSE DAM SITE 16  
HARDY COUNTY, WEST VIRGINIA

**WETLAND DELINEATION**

AREA OF WETLAND		
WETLAND	SQUARE FEET	ACRES
1	1,068,511.73	24.53
2	8,878.85	0.20
3	1,681.98	0.04
4	731.37	0.02
5	496.93	0.01
6	28,539.17	0.66
7	7,245.10	0.17
8	11,498.75	0.26
SUBTOTAL	1,126,753.22	25.87
WATER SURFACE	-9,480.16	-0.22
TOTAL	1,117,273.06	25.65

**NRCS**  
Natural Resources Conservation Service  
United States Department of Agriculture

File No. \_\_\_\_\_

Drawing No. **WETLAND.DWG**

Sheet 1 of 1

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## SITE PHOTOGRAPHY



TP-1 – Note bare soil, tame grasses, compaction, etc.



TP-1 Soils showing a reduced matrix and meeting the F3 indicator.



TP-2 – Soil verification



TP-2 – Soil description



TP-3 Location.



TP-3 Location. Note vegetation along drainage ditch



TP-4 Location showing *Juncus* sp. et. al. communities



TP-4 Soils Description



TP-5 Location of old stream meanders



TP-5 Hydric Soil showing depleted matrix within stream meander



TP-5 Overall view of area showing old stream meanders



Minor Fill Example near Area 2



Drainage ditch example near Area 1



TP-6 Location



TP-6 Typical Area



TP-6 Soil description



TP-7 Typical vegetation community- woodland edge



Example of landuse within Area 1



View near TP5



Note ditch and contrasting communities between grazing intensities near Area 1