

Stream Habitat Assessment and Wetland Delineation Report

**P Ridge Processing Site
Daviness and Ohio Counties, Kentucky**

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TABLE OF CONTENTS

I.	INTRODUCTION	1
	Introduction	1
	Location	1
	Background and Description	1
	Purpose of Project	1
II.	STREAM ASSESSMENT AND WETLAND DELINEATION METHODS.....	2
	Streams	2
	Wetlands	3
III.	EXISTING CONDITIONS: STREAMS.....	3
IV.	EXISTING CONDITIONS: WETLANDS	9
V.	REFERENCES	13
VI.	TABLES.....	14
VII.	EXHIBITS	17
VIII.	APPENDIX	

I. INTRODUCTION

Introduction

This report is a description of streams and wetlands located within a 34.1 acre study area in Daviess and Ohio Counties, Kentucky. Information contained within this document was compiled for the purpose of identifying potential environmental impacts that may be associated with a future coal mining operation. The report will focus on the physical assessment of streams and wetlands. The documentation of existing conditions will aid in determining the amount of mitigation that will be required for potential impacts on jurisdictional waters of the United States.

The data presented in this report is based upon field investigation, general research, and information supplied by Western Kentucky Minerals, Inc. Information gathered is summarized, supported or illustrated by tables and exhibits. The exhibits and appendix include the following: project vicinity map, aerial map, National Wetlands Inventory map, soils map, USGS topographic quadrangle, floodplain map, cross sections of larger streams, stream habitat assessment forms, wetland delineation forms, and photographic documentation.

Location

The proposed permit study area is located in Daviess and Ohio Counties. It is approximately 10 miles northwest of Hartford, in Ohio County (Utica USGS 7.5 minute topographic quadrangle), with its center at Latitude: 37° 34' 54" N, Longitude: 87° 00' 16" W. The site can be accessed from Boling Road, off US 231 north of Hartford. See Exhibit 1 for project location.

Background and Description

The main area of the proposed site was previously mined and reclaimed. Topography in the area generally consists of rolling terrain. The 34.1-acre study area, including the haul road, consists of a mix of land uses; with some forest (approximately 6 acres), agricultural lands (approximately 10 acres, either pastured or tilled), and open waters (approximately 3.5 acres). The forest age ranges from mature, second-growth to young forest comprised of saplings and thick undergrowth. Dominant tree species include maple, river birch, sycamore, and black willow.

Purpose of Project

The purpose of the project is for Western Kentucky Minerals to establish a coal processing operation and associated haul road.

II. STREAM ASSESSMENT AND WETLAND DELINEATION METHODS

Streams

The Environmental Protection Agency's (EPA) *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers* (1999) was used to assess streams in the permit area. Rapid Bioassessment Protocol (RBP) high gradient or low gradient field data sheets were completed for each stream. Documentation for each stream also includes photographs, location, typical cross-section, and total length. The protocol matrix used to assess habitat quality is based on key physical characteristics of the water-body and surrounding land, particularly the catchment of the site under investigation. Habitat is defined as the quality of in-stream and riparian habitat that influences the structure and function of the aquatic community in a stream. This matrix provides an effective means of evaluating and documenting habitat quality at each site. Habitat parameters evaluated are related to overall aquatic life use and are a potential source of limitation to aquatic biota. Site selection for assessment was based upon a probabilistic approach to provide information about the overall status or condition of each site (Barbour, et al. 1999).

For this report, assessments focus on the matrix in which physical characteristics of each stream are evaluated on 10 parameters with scales from 0 to 20, in which 20 represents a pristine situation. Parameters address characteristics including substrate, flow regime, sediment deposition, and riparian zone quality, among others. The potential score for a pristine evaluation is 200 total, but a high habitat assessment score can still represent a poor stream when taking into account conductivity, which contributes to overall ecological integrity.

In addition, each stream was classified by "type", according to the Rosgen methodology, based on various geomorphic parameters (entrenchment ratios, width to depth ratios, slope, etc.) taken from cross-section and contour information.

Stream lengths, channel locations and limits were determined in the field utilizing manual measuring techniques including range finding, pacing, global positioning, and verification of mapping. Stream flow was determined in the field based upon stream status at the time of visit. The final determination of stream quantity and jurisdiction will be decided by the United States Army Corps of Engineers (USACE). USGS mapping was used to determine drainage areas for the streams, making those measurements approximate. See the appendix for stream assessment (RBP) forms and photographs.

Wetlands

Potential wetlands within the project area were evaluated for the presence of wetland characteristics during January and February, 2013. On-site wetland determinations were conducted using criteria outlined in the 2010 USACE *Draft Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region*. Hydrology, vegetation, and soils were evaluated. Soil characteristics were identified using soil borings and a Munsell soil color chart. Potential wetland boundaries were defined in the field, surveyed using a hand-held global positioning unit and transferred to project mapping in order to determine approximate wetland areas. Data on soils were taken from the Natural Resources Conservation Service's Soil Surveys of Daviess and Ohio Counties, Kentucky (USDA). The National Wetland Inventory (NWI) geospatial data for the Utica Quadrangle (U.S. Fish and Wildlife Service) was examined for existing Cowardin classifications (Cowardin et al. 1979). The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps were consulted for floodplain boundaries. Refer to Exhibits 2 and 3 for locations of delineated wetlands on project mapping. Four areas exhibiting indicators of hydric soils, wetland hydrology, and hydrophytic plant communities are located within the permit boundary; these areas will be referred to as "wetlands" for the remainder of the document, pending USACE confirmation. Tentative Cowardin classifications are assigned based on dominant vegetation and hydrologic conditions observed during delineations. See Table 2 for a summary of wetland information. See the appendix for Wetland Delineation Forms and photographs.

III. EXISTING CONDITIONS

Streams

There are four intermittent streams, and six ephemeral streams located within or immediately adjacent to the proposed study boundary; identified on Exhibits 2 and 3. Refer to Table 1 for a summary of the stream information, which includes RBP scores, conductivity readings where available, stream flow regime type, and drainage area.

Stream Assessments – Intermittent

Intermittent Stream 1 (I-1) is located in the eastern section of the study area and flows northward to the study boundary from Wetland A for approximately 81 feet. At the boundary

limit the stream has a drainage area of approximately 6.1 acres. The stream bottom width was 1.0 foot, while the bankfull width was approximately 1.5 feet.

The EPA stream habitat assessment (Low Gradient) for the stream indicates an epifaunal substrate/available cover score in the marginal range. The substrate consists of predominantly silt/clay-sized material, with some sand-sized material present; streambed morphology consists of runs. At the time of assessment, flow was utilizing greater than 75 percent of the channel bottom. There was evidence of moderate deposition of new fine material, affecting 50 to 80 percent of the bottom. Additionally, evidence of past channelization was observed, which may account for the poor sinuosity score. Bank stability scored in the high suboptimal (moderately stable) range for both banks, with small, infrequent erosion problems present. Vegetative protection also scored in the suboptimal range. The riparian zone width scored marginal along both banks (partially exposed channel in pasture setting). Riparian vegetation was dominated by trees, shrubs, herbaceous, and grass species.

Stream I-1 has a total habitat score of 103, corresponding to a stream quality rating of low suboptimal, and a conductivity reading of 305 μ S. As a result it is classified as an "E6" type, in accordance with Rosgen methodology.

Intermittent Stream 2 (I-2) is located at two sites within or near the haul road corridor (i.e., northern and north-central sections of the study area) and is an unnamed tributary to North Fork Barnett Creek. I-2 flows southwesterly for a total of 416 feet through the corridor; 119 feet (including 29 feet of existing culvert) at the upstream site and 297 feet at the downstream site. The drainage area at the upstream site is 512 acres and 621 acres at the downstream site. Both areas were assessed and noted respectively ("US" for upstream and "DS" for downstream). When averaged, the stream bottom width is 4.0 feet and the bankfull width is 12.2 feet.

The EPA stream habitat assessment (Low Gradient) for I-2US indicates an epifaunal substrate/available cover score in the high marginal range; however, the substrate consists of only silt/clay-sized material. Streambed morphology consists of only runs. At the time of assessment, there was flow utilizing 25 to 75 percent of the channel bottom. There was evidence of moderate deposition of new fine material, affecting 50 to 80 percent of the bottom. Some past channelization may have been extensive (evidenced by an existing culvert), but no recent evidence was observed. Sinuosity scored poor. Bank stability scored in the low marginal range for both banks (moderately unstable). Vegetative protection scored in the marginal range, while the riparian zone width scored poor (located in agricultural fields where channel is

fully exposed). The dominant riparian vegetation consisted of trees, shrubs, and herbaceous species.

The EPA stream habitat assessment (Low Gradient) for I-2DS indicates an epifaunal substrate/available cover score also in the high marginal range. The substrate consists of predominantly silt/clay-sized material, but sand and gravel sizes are also present. Streambed morphology consists of long runs and short pool sections. At the time of assessment there was flow utilizing greater than 75 percent of the channel bottom. Again, there was evidence of moderate deposition of new fine material. Past channelization may have occurred, but sinuosity scored better, being in the marginal range. Bank stability and vegetative protection also scored in the marginal range for both banks; riparian zone width scored poorly. The dominant riparian vegetation consisted of trees, shrubs, and herbaceous species.

Stream I-2 has an average total habitat score of 84, corresponding to a stream quality rating of marginal, and an average conductivity of 132 μS . In utilizing Rosgen methodology, the stream is classified upstream as a "G6" type and downstream as an "F6" type.

Intermittent Stream 3 (I-3) is located in the western section of the study area, downstream of a beaver dam in Pond 1. It appears to be the outlet channel for the pond. It flows westerly through Wetland C to the study boundary for 54 feet. At the boundary limit the stream has a drainage area of approximately 28.3 acres. The stream bottom width was approximated at 2.5 feet, while the bankfull width was 5.0 feet.

The EPA stream habitat assessment (Low Gradient) for the stream indicates an epifaunal substrate/available cover score in the marginal range. The substrate consists of silt/clay-sized material, while streambed morphology is defined by runs. At the time of assessment, flow was utilizing the entire width of the channel bottom. There was evidence of moderate deposition of new fine material and extensive past channelization; however, no recent alterations were observed (channel may have been the outlet for the existing pit/pond). This accounts for the poor sinuosity score. Bank stability scored in the suboptimal (moderately stable) range for both banks, with small infrequent erosion problems present. Both vegetative protection and riparian zone width scored in the suboptimal range; riparian vegetation was dominated by trees, shrubs, herbaceous, and grass species.

Stream I-3 has a total habitat score of 96, corresponding to a stream quality rating of high marginal, and a conductivity reading of 629 μS . It has a Rosgen classification of an "E6" channel.

Intermittent Stream 4 (I-4) is located in the north-central section of the study area, where the haul road corridor leaves the main facility area. It flows west through the road corridor study boundary for approximately 100 feet. At the lower boundary limit the stream has a drainage area of approximately 40.7 acres. The stream bottom width was approximated at 1.0 feet, while the bankfull width was 6.0 feet.

The EPA stream habitat assessment (Low Gradient) for the stream indicates an epifaunal substrate/available cover score in the marginal range. The substrate consists of an equal mix of silt/clay and sand-sized material, while streambed morphology is defined by short runs and long pool sections. At the time of assessment, flow was utilizing the entire width of the channel bottom. There was evidence of moderate deposition of new fine material and extensive past channelization; however, no recent alterations were observed. This would account for the poor sinuosity score. Bank stability scored in the suboptimal (moderately stable) range for both banks, with small infrequent erosion problems present. Vegetative protection also scored suboptimal. The riparian zone width scored marginal (left bank) to poor (Right bank); riparian vegetation was dominated by trees, shrubs, and herbaceous species.

Stream I-4 has a total habitat score of 101, corresponding to a stream quality rating of low suboptimal, and a conductivity reading of 219 μ S. It has a Rosgen classification of an "E5/6" channel.

Stream Assessments - Ephemeral

The remaining six streams are ephemeral in nature and occur throughout the study boundary area. Typically these are found in large numbers and grouped for discussion purposes. Since only six were found, they are discussed individually.

Ephemeral Stream 1 (E-1) is located in the southwestern section of the study area and flows into Pond 1. It flows northeasterly for approximately 484 feet within a drainage area of 6.7 acres at the confluence with the pond. The stream has an approximate bottom width of 1.0 foot and bankfull width of 1.5 feet.

The stream habitat assessment (Low Gradient) for this reach (E-1) indicates an epifaunal substrate/available cover score in the marginal range. The streambed morphology consists of long runs and short pool sections; runs are predominantly gravel-sized material, whereas pools are mostly silt/clay and sand. Channel flow, which utilized 25 to 75 percent of the bottom, was observed at the time of assessment. There was evidence of moderate deposition of

new fine material, affecting 50 to 80 percent of the bottom. Some past channelization was evident resulting in a low marginal sinuosity score. Bank stability scored in the suboptimal range (moderately stable). Vegetative protection also scored in the suboptimal range for both banks, while the riparian zone width scored marginal to suboptimal. Dominant riparian vegetation is generally trees, shrubs, herbaceous, and grass species.

Stream E-1, a Rosgen-classified “B4” stream, has an average total habitat score of 102, which corresponds to a stream quality rating of low suboptimal. Conductivity yielded a reading of 526 μ S.

Ephemeral Stream 2 (E-2), located in the southwestern section of the study area, is also a tributary to Pond 1. It flows northwesterly for approximately 207 feet and its watershed is 3.6 acres. The stream bottom width is an estimated 0.8 feet, whereas the bankfull width is approximately 1.25 feet.

The EPA stream habitat assessment (Low Gradient) for E-2 indicates an epifaunal substrate/available cover score in the poor range (lack of stable habitat). The substrate consists of predominantly gravel-sized material with some silt/clay and sand; streambed morphology is defined by runs. At the time of assessment, there was little flow found in the channel bottom. Heavy deposition of new fine material affected at least 80 percent of the bottom, and past channelization lowered its sinuosity score. Both bank stability and vegetative protection scored in the suboptimal range (moderately stable), while riparian zone width was considered marginal. Dominant riparian vegetation consisted of various tree, shrub, herbaceous, and grasses species.

Stream E-2 was classified as a Rosgen “B4” type stream. Its total habitat score was 71 (a stream quality rating of marginal) with a high conductivity reading of 1581 μ S.

Ephemeral Stream 3 (E-3), located in the middle of the study area, flows 487 feet northwesterly to Pond 1. It has a drainage area of 10.3 acres, bottom width of 1.0 feet, and bankfull width of 1.5 feet.

The EPA stream habitat assessment (Low Gradient) for E-3 indicates an epifaunal substrate/available cover score in the marginal range. The streambed morphology consists of long runs, very short riffles, and short, shallow pools. Substrate is a mix of silt/clay-sized to gravel-sized material, varying in percentages based on location within a riffle, run, or pool. At the time of assessment, there was flow in 25 to 75 percent of the channel bottom and moderate deposition of new fine material. Evidence of some past channelization was observed; therefore,

sinuosity scoring was low marginal. Both bank stability and vegetative protection scored in the suboptimal range (moderately stable), while riparian zone width scored poorly (likely due to a lack of trees). The dominant riparian vegetation typically consisted of tree, shrub, herbaceous, and grass species.

Stream E-3 was classified as a Rosgen “B6” type stream. Its total habitat score was 90 (a stream quality rating of marginal) with a conductivity reading of 388 μ S.

Ephemeral Stream 4 (E-4), a tributary of intermittent I-2, is located in the northern section of the study area about midway along the haul road corridor. It flows southwesterly for approximately 134 feet within a watershed of 38.5 acres. Stream bottom width is estimated to be 1.0 foot and bankfull width 3.0 feet.

The stream habitat assessment (Low Gradient) for E-4 indicates an epifaunal substrate/available cover score in the suboptimal range. Streambed morphology consists of long runs and short pools, which are predominantly silt/clay substrates with trace sand and gravel-sized material. Channel flow (greater than 75 percent of the stream bottom) and moderate deposition of new fine material was observed at the time of assessment. A poor sinuosity score is indicative of past (possibly extensive) channelization practices. Bank stability scored in the marginal range (moderately unstable). Vegetative protection also scored in the marginal range, with 50 to 70 percent of the streambank surface covered. Riparian zone width, however, scored poorly due to its close proximity to an agricultural field. Dominant riparian vegetation consisted of trees, shrubs, and herbaceous species.

Stream E-4 has a total habitat score of 84 (a stream quality rating of marginal), a conductivity of 373 μ S, and a “G6” type Rosgen classification.

Ephemeral Stream 5 (E-5), another tributary of intermittent I-2, is also located in the northern section of the study area along the proposed haul road. It flows westerly for approximately 100 feet (including 30 feet of existing culvert) within a watershed of 55.5 acres. The stream has an average bottom width of 1.25 feet and an approximate bankfull width of 6.0 feet.

The stream habitat assessment (Low Gradient) for this reach indicates an epifaunal substrate/available cover score in the marginal range. Streambed morphology consists entirely of runs containing silt/clay-sized material. At the time of assessment flow was present (utilizing 25 to 75 percent of the channel bottom) as well as new fine material deposition. There is evidence of past, possibly extensive, channelization; though no alterations have occurred

recently there is a culvert in place. Sinuosity scored in the poor range, whereas bank stability and vegetative protection was marginal (moderately unstable with evidence of erosion). Due to the stream's proximity to an agricultural field, riparian zone width varied from marginal (left bank) to poor (right bank) with dominant tree, shrub, and herbaceous species.

Stream E-5 has a Rosgen classification of "G6." Its total habitat score was 73, corresponding to a stream quality rating of marginal, and conductivity was 61 μ S.

Ephemeral Stream 6 (E-6), located at the northern end of the study area along the haul road, is also a tributary to intermittent stream I-2. It flows south for approximately 159 feet within a watershed area of 13.7 acres. The stream has a bottom width of approximately 1.0 foot and a bankfull width 1.5 feet.

The stream habitat assessment (Low Gradient) for E-6 indicates an epifaunal substrate/available cover score in the marginal range. Streambed morphology consists entirely of runs containing silt/clay-sized material. There was flow in 25 to 75 percent of the channel bottom, as well as moderate deposition of new fine material. Evidence of past (possibly extensive) channelization lowered the sinuosity score to poor. Bank stability scored in the marginal range (moderately unstable), vegetative protection in the suboptimal range (70 to 90 percent of the streambank surface covered), and riparian zone width scored poor, likely due to its location in an agricultural field. Within the riparian zone, only shrubs and herbaceous species were observed.

Stream E-6 has a Rosgen classification of "G6." Its total habitat score was 69, corresponding to a stream quality rating of marginal, and conductivity was 56 μ S.

Wetlands

Six wetland areas totaling approximately 0.808 acres occur within or adjacent to the study area boundary. Of this acreage, approximately 0.688 acres occur within the boundary. Refer to Exhibits 2 and 3 for locations of delineated wetlands, the appendix for photographs, and Table 2 for the summary of wetland information. Wetlands were delineated in accordance with the 1987 Corps of Engineers Wetland Delineation Manual. Although these areas are referred to as wetlands, these determinations are assigned pending final USACE verifications.

Wetland A is located at the southeast corner of the permit boundary and is classified as a palustrine emergent wetland that is saturated (PEM1B, <2% slope). It has a total area of 0.061 acres and drains into intermittent I-1. The following herbaceous species are dominant at

the site: common rush (*Juncus effusus*), goldenrod (*Solidago rugosa*), thoroughwort (*Eupatoria* sp.), common reed (*Phragmites australis*) and switchgrass (*Panicum dichotomiflorum*). Both the tree and shrub/sapling strata were less prevalent, represented only by a few scattered black willow (*Salix nigra*) and red maple (*Acer rubrum*). Previous mining practices (mine soils) made it difficult to obtain a full soil sample; therefore, investigators relied heavily upon hydrophytic vegetation and hydrological indicators. Because hydrophytic vegetation passed the rapid test and three primary indicators were observed (i.e., high water table, saturation, and iron deposits), hydric soils were assumed to be present.

Wetland B is located at the southeast corner of the permit boundary adjacent to Wetland A. It has a total area of 0.194 acres and is classified as palustrine emergent with saturation (PEM1B, <2% slope). Vegetation is similar to Wetland A in that herbaceous species dominate (i.e., thoroughwort (*Eupatorium serotinum*), goldenrod (*Solidago canadum*), white aster (*Sumphotrichum lateriflorum*), sedge (*Carex stipata*), switchgrass (*Panicum dichotomiflorum*), field thistle (*Cirsium discolor*) and common rush (*Juncus effusus*)). Furthermore, few scattered young/mature black willows (*S. nigra*) were interspersed throughout. As stated before, soils were problematic due to previous mining practices (mine soils); therefore, emphasis was placed on present hydrology and hydrophytic vegetation. Based on the primary hydrological indicators observed (i.e., high water table, saturation, water marks and iron deposits), soils were assumed hydric.

Wetland C is located at the southwest portion of the permit boundary adjacent to Pond 1 at an apparent outlet channel (stream I-3). It is a mix of palustrine forested and emergent with semi-permanent flooding (PFO1A/PEM1F). The wetland has a total area of 0.326 acres, with 0.236 acres within the study boundary. Dominant species in the tree stratum include red maple (*Acer rubrum*), river birch (*Betula nigra*) and sweetgum (*Liquidambar styraciflua*); in the sapling stratum is alder (*Alnus serrulata*) and red maple (*A. rubrum*); and dominant herbaceous species are common rush (*Juncus effusus*), seedbox (*Ludwigia alternifolia*), goldenrod (*Solidago rugosa*), fescue (*Festuca arundinacea*) and cattail (*Typha latifolia*). Hydrophytic vegetation is established by the rapid test. In the top 12 inches of soil, samples varied from 10YR 5/2 to 10YR 5/3 with redox features of 10YR 5/8 (coal remnants were also present), characteristics indicative of F3 soils, or a depleted matrix. The soil series was Loring silty clay loam (<2% slope), and several primary hydrological indicators were observed (i.e., surface water, high water table, saturation, sediment deposits and water-stained leaves).

Wetland D is located near the northeast corner of the large pond within the main permit area, and is classified as palustrine shrub-scrub with seasonal flooding/saturation (PSS1E). The wetland has a total area of 0.056 acres, and drains into the large pond. The tree stratum species were sparse (due to beaver activity) and consisted of few scattered red maples (*Acer rubrum*), river birches (*Betula nigra*) and pin oaks (*Quercus palustris*). Dominant sapling species include red maple (*A. rubrum*) and black willow (*S. nigra*), whereas dominant herbaceous species are goldenrod (*Solidago rugosa*) and thoroughwort (*Eupatorium serotinum*). The only woody vine present was honeysuckle (*Lonicera japonica*). Hydrophytic vegetation was established by the rapid test. In the top four inches of soil, samples yielded a consistent matrix color of 10YR 4/1 with 10YR 5/8 redox features; again, these characteristics indicate F3 (depleted matrix) soils. Texture was a silty-clay loam belonging to the Waverly silt loam series (<2% slope). The presence of surface water, a high water table and saturation are primary indicators of wetland hydrology.

Wetland E is a small ponded area located at the southern edge of the permit boundary, and is classified as palustrine emergent with seasonal flooding (PEM1C). It has a total area of 0.013 acres and flows to tributary E-2. At the time of assessment, wetland fringe had been closely mowed; however, investigators were still able to employ the rapid test to determine hydrophytic vegetation. Dominant herbaceous vegetation include fescue (*Festuca arundinacea*) and cattail (*Typha latifolia*), and one mature sweetgum (*Liquidambar styraciflua*) was present. Soils belong to the Fairpoint-Bethesda and Morristown series and exhibit a silt-clay loam texture. Within the top four inches, samples yield F3 characteristics, a matrix color of 10YR 4/1 with 10YR 4/8 redox features. Primary hydrological indicators were observed as well (i.e., surface water, high water table, saturation, and the presence of reduced iron).

Wetland F has a total area of 0.158 acres, with 0.128 acres within the study boundary. It is located within the floodplain of intermittent stream, I-2, where the proposed haul road enters the main permit area. It is classified as palustrine forested with temporary flooding (PFO1A). Dominant tree species include river birch (*Betula nigra*), red maple (*Acer rubrum*) and sycamore (*Platanus occidentalis*); sapling species of river birch (*B. nigra*), red maple (*A. rubrum*) and black willow (*S. nigra*); and herbaceous species of wild onion (*Allium tricoccum*), sedge (*Carex sp.*) and deertongue (*Panicum cladestinum*). Again, the presence of hydrophytic vegetation is determined using the rapid test. The soils have a silt-clay texture with a matrix color of 10YR

5/4 and a redox feature of 10YR 5/6 from 5 to 8 inches. The top 5 inches consist of light brown clay, and the soils are brown below 8 inches. The soils are borderline hydric at this location. The presence of surface water, water-stained leaves and the presence of reduced iron are primary indicators of wetland hydrology, and a sparsely vegetated concave surface and moss trim lines are secondary indicators.

Pond 1 – There is one 3.207 acre pond within the project study boundary that is associated with several of the stream discussed previously. It appears that any potential wetland fringe has been limited to Wetland C, as a result of beaver activity. A large beaver dam, located at the headwaters of intermittent stream, I-3, has raised water levels approximately one foot; therefore, any potential herbaceous fringe is under water. Some alder species were observed, though most were submerged. See Table 3 for a summary of information on this resource.

V. REFERENCES

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VI. TABLES

Table 1. Summary of Stream Information

Table 2. Summary of Wetland Information

Table 3. Summary of Pond/Open Waters

Table 1: Summary of Stream Study Information

Stream	Latitude	Longitude	Habitat Score	Conductivity (µS)	Stream Type	Studied Length (ft)	Drainage Area (ac)	Rosgen Class
I-1	37.581194	87.002028	103	305	Intermittent	81	6.1	E6
I-2US	37.588028	87.002556	78	136	Intermittent	119*	512.0	G6f
I-2DS	37.583389	87.005083	91	128	Intermittent	297	621.0	F6
I-3	37.580833	87.006806	96	629	Intermittent	54	28.3	E6
I-4	37.583056	87.004889	101	219	Intermittent	100	40.7	E5/6f
E-1	37.580167	87.034917	102	526	Ephemeral	484	6.7	B4
E-2	37.580583	87.033750	71	1581	Ephemeral	207	3.6	B4
E-3	37.558172	87.003750	90	388	Ephemeral	487	10.3	B6
E-4	37.585272	87.002222	84	373	Ephemeral	134	38.5	G6
E-5	37.586611	87.002417	73	61	Ephemeral	100*	55.5	G6
E-6	37.588222	87.002722	69	56	Ephemeral	159	13.7	G6
Intermittent Totals						651		
Ephemeral Totals						1571		

*Length includes existing culverts

Table 2. Summary of Wetlands

Wetland	Latitude	Longitude	Classification	Connectivity	Wetland Area (acres)	Area in Study Boundary
A	37.580944	87.001667	PEM1B	Yes	0.061	0.061
B	37.580889	87.001889	PEM1B	Yes	0.194	0.194
C	37.580750	87.006833	PFO1A/PEM1F	Yes	0.326	0.236
D	37.581750	87.004389	PSS1E	Yes	0.056	0.056
E	37.580583	87.004167	PEM1C	Yes	0.013	0.013
F	37.582972	87.005306	PFO1A	Yes	0.158	0.128
Totals					0.808	0.688

NOTE : Data provided in these tables are for baseline study purposes only. The amount of streams, wetlands, and pond areas studied **may not reflect future impact lengths or acreages.**

Table 3. Summary of Ponds (Open Water)

Pond	Latitude	Longitude	Total Area (Acres)	Area in Boundary (Acres)
1	37.581508	87.005678	3.207	3.207
	Totals		3.207	3.207

NOTE : Data provided in these tables are for baseline study purposes only. The amount of streams, wetlands, and pond areas studied **may not reflect future impact lengths or acreages.**

VII. EXHIBITS

Exhibit 1: Vicinity Map

Exhibit 2: USGS Topographic Map

Exhibit 3: Aerial Map

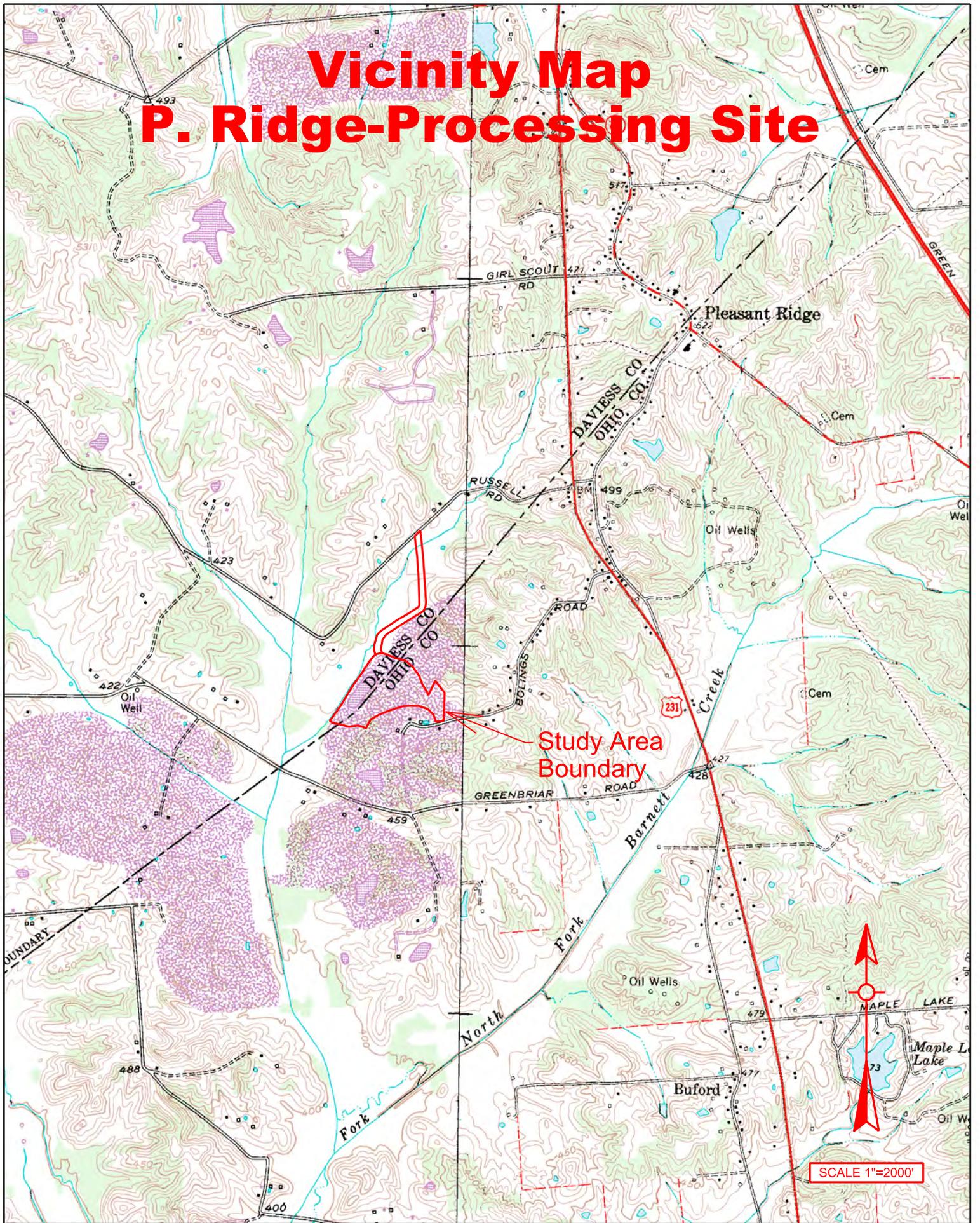
Exhibit 4: National Wetlands Inventory (NWI) Map

Exhibit 5: Soil Map

Exhibit 6: FEMA Flood Insurance Rate Map

Exhibits 7-9: Existing Stream Cross-sections

Vicinity Map P. Ridge-Processing Site

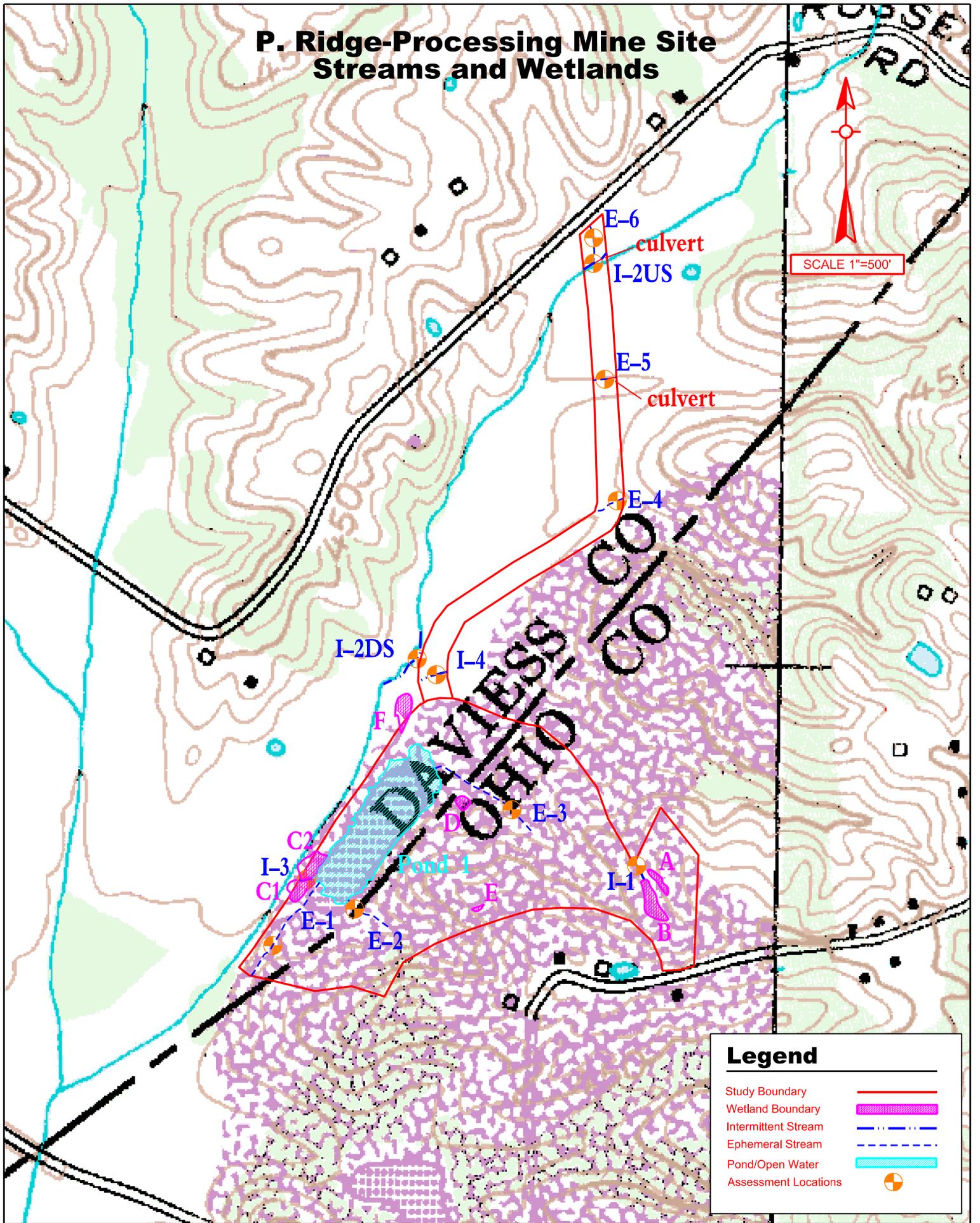


SCALE 1"=2000'

T.H.E. Engineers, Inc.	PROJECT: P. RIDGE-PROCESSING MINE SITE - STUDY BOUNDARY		STREAMS: UT'S TO NORTH FORK BARNETT CREEK		
	COUNTY: DAVIESS	STATE: KY	NEAR: PLEASANT RIDGE	ITEM: VICINITY MAP	EXHIBIT 1

DATE:

P. Ridge-Processing Mine Site Streams and Wetlands



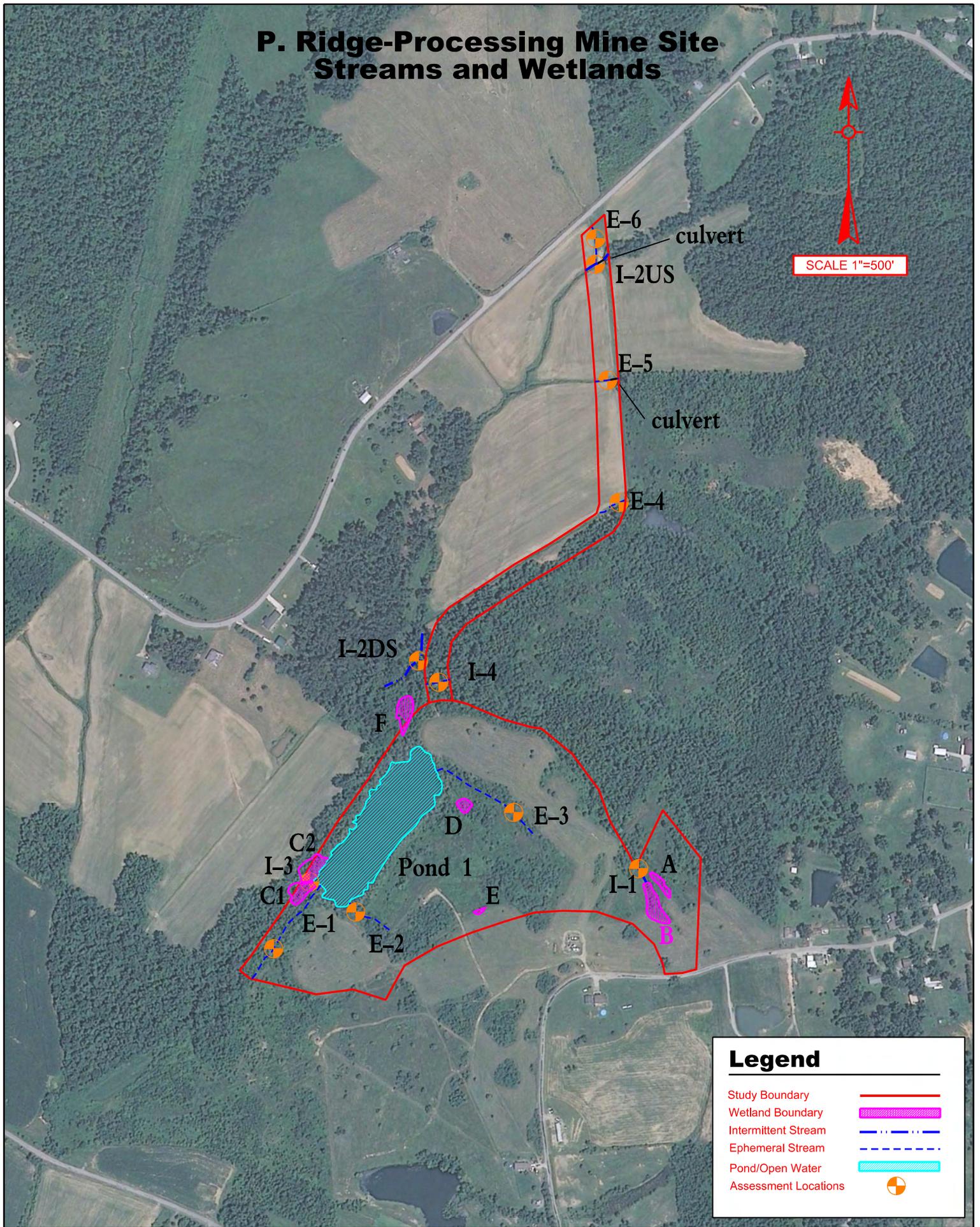
Legend

- Study Boundary ———
- Wetland Boundary ▨▨▨▨
- Intermittent Stream - - - - -
- Ephemeral Stream - · - · -
- Pond/Open Water ▨▨▨▨
- Assessment Locations ⊕

T.H.E. Engineers, Inc.	PROJECT: P. RIDGE-PROCESSING MINE SITE - JURISDICTIONAL WATERS DELINEATION	UT's of NORTH FORK BARNETT CREEK	
	COUNTY: DAVIESS	STATE: KY	NEAR: PLEASANT RIDGE
		ITEM: QUAD MAP	EXHIBIT 2

DATE:

P. Ridge-Processing Mine Site Streams and Wetlands



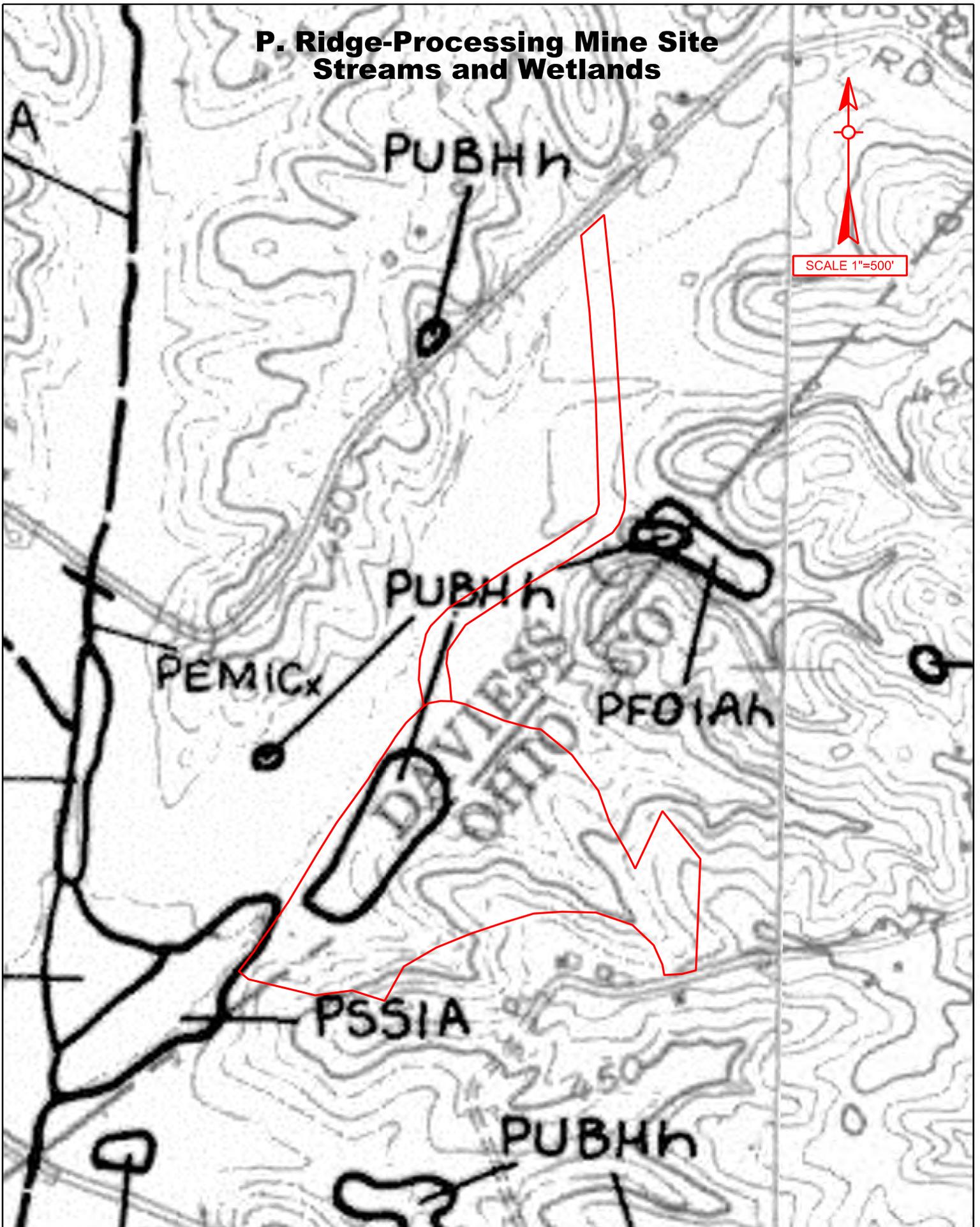
Legend

- Study Boundary ———
- Wetland Boundary ▨▨▨▨
- Intermittent Stream - - - - -
- Ephemeral Stream - - - - -
- Pond/Open Water ▨▨▨▨
- Assessment Locations ⊕

T.H.E. Engineers, Inc.	PROJECT: P. RIDGE-PROCESSING MINE SITE - JURISDICTIONAL WATERS DELINEATION		UT's OF NORTH FORK BARNETT CREEK	
	COUNTY: DAVIESS	STATE: KY	NEAR: PLEASANT RIDGE	ITEM: AERIAL MAP
				EXHIBIT 3

DATE:

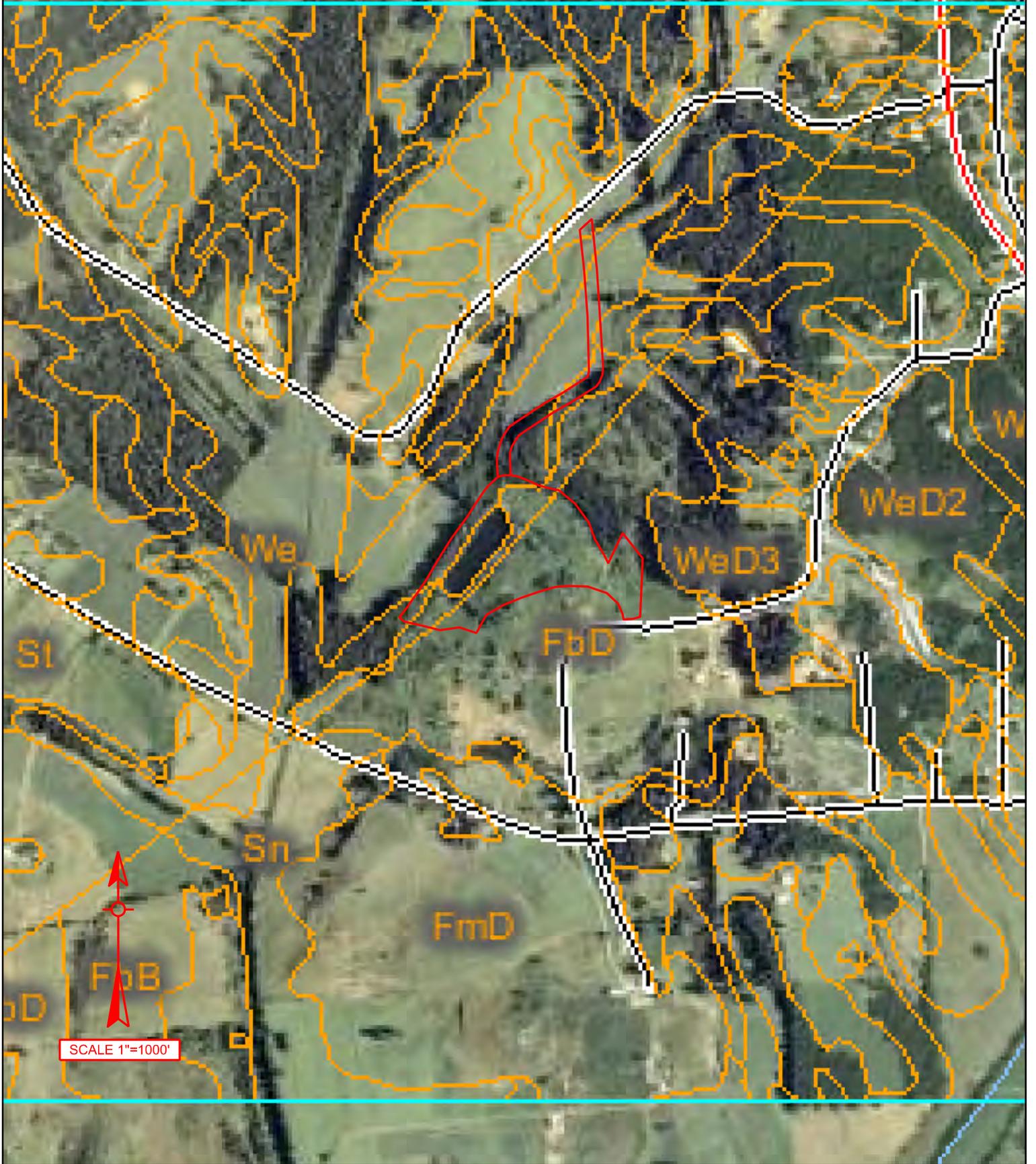
P. Ridge-Processing Mine Site Streams and Wetlands



T.H.E. Engineers, Inc.	PROJECT: P. RIDGE-PROCESSING MINE SITE - JURISDICTIONAL WATERS DELINEATION			UT's of NORTH FORK BARNETT CREEK	
	COUNTY: DAVIESS	STATE: KY	NEAR: PLEASANT RIDGE	ITEM: NWI MAP	EXHIBIT 4

DATE:

P. Ridge-Processing Mine Site Streams and Wetlands



T.H.E. Engineers, Inc.	PROJECT: P. RIDGE-PROCESSING MINE SITE - JURISDICTIONAL WATERS DELINEATION			UT's OF NORTH FORK BARNETT CREEK	
	COUNTY: DAVIESS	STATE: KY	NEAR: PLEASANT RIDGE	ITEM: SOIL MAP	EXHIBIT 5

DATE:

P. Ridge-Processing Mine Site Streams and Wetlands



SCALE 1"=500'



RUSSELL RD

ZONE X

DAVISS COUNTY

BOLING
RD



T.H.E. Engineers, Inc.	PROJECT: P. RIDGE-PROCESSING MINE SITE - JURISDICTIONAL WATERS DELINEATION		UT's OF NORTH FORK BARNETT CREEK		
	COUNTY: DAVIESS	STATE: KY	NEAR: PLEASANT RIDGE	ITEM: FEMA MAP	EXHIBIT 6

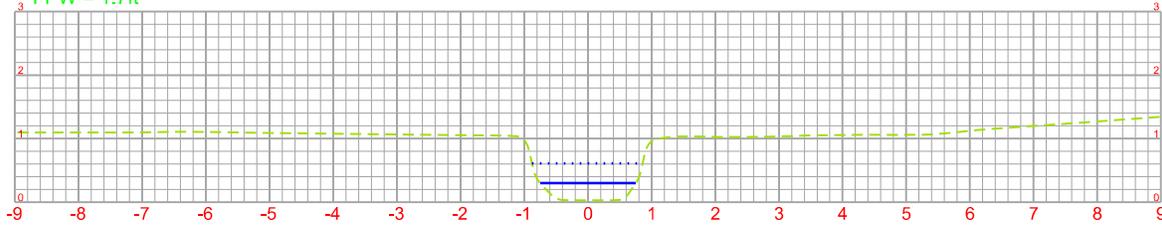
DATE:

Existing Intermittent (INT) Cross Sections

BF=Bankfull
 FP= Floodprone
 Existing Ground

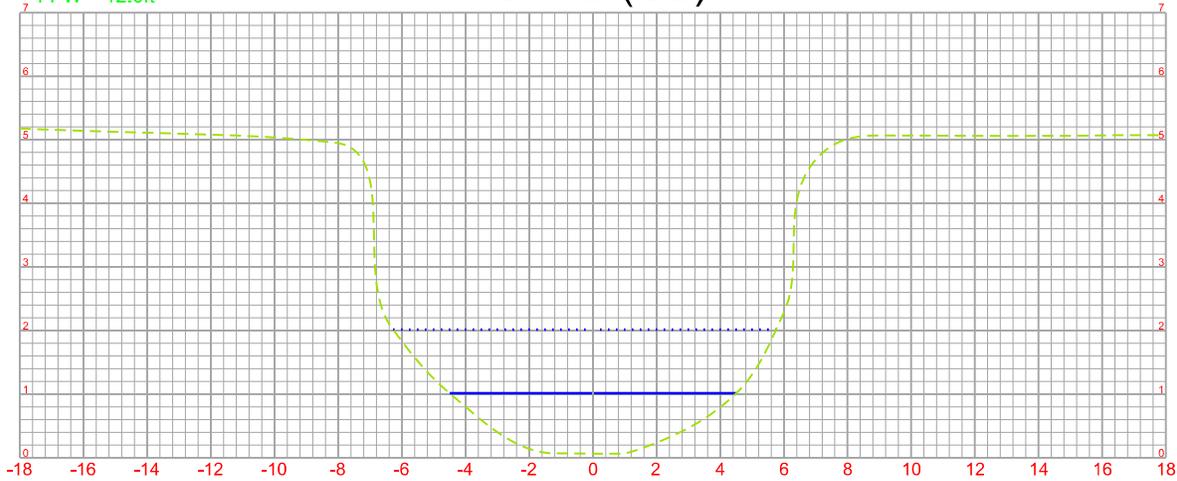
BFW = 1.5ft
 BFD max = 0.3ft
 FPW = 1.7ft

INT-1



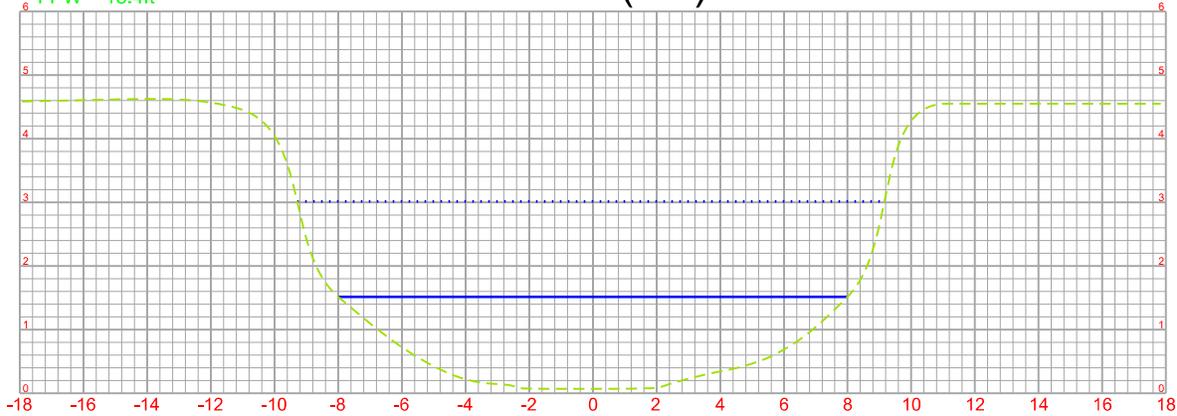
BFW = 9.0ft
 BFD max = 1.0ft
 FPW = 12.0ft

INT-2 (US)



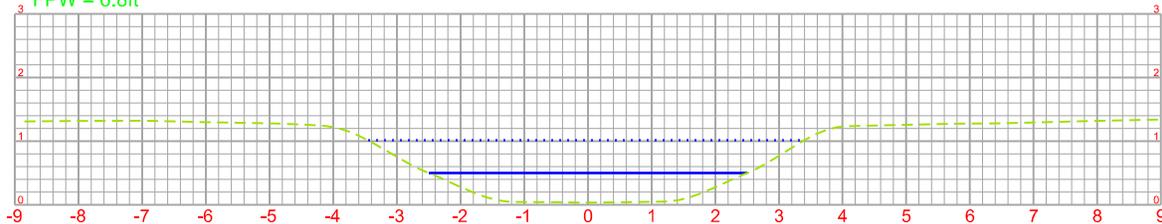
BFW = 16.0ft
 BFD max = 1.5ft
 FPW = 18.4ft

INT-2 (DS)



BFW = 5.0ft
 BFD max = 0.5ft
 FPW = 6.8ft

INT-3



Cross Section Scale: 1"=3'

T.H.E. Engineers, Inc.	PROJECT: P. RIDGE-PROCESSING MINE SITE			STREAM: INT-1, INT-2(US), INT-2(DS), INT-3	
	COUNTY: DAVIESS	STATE: KENTUCKY	NEAR: PLEASANT RIDGE	EXISTING CROSS SECTIONS	EXHIBIT 7

DATE:

Existing Intermittent (INT) Ephemeral (EPH) Cross Sections

BF=Bankfull
FP= Floodprone
Existing Ground

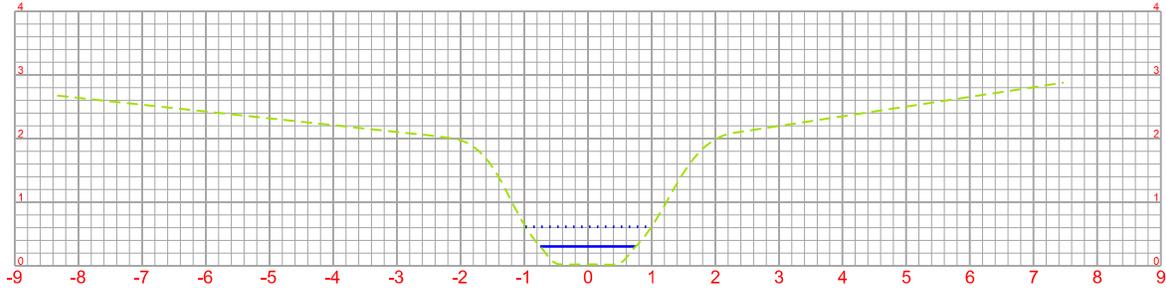
BFW = 6.0ft
BFD max = 1.0ft
FPW = 7.5ft

INT-4



BFW = 1.5ft
BFD max = 0.3ft
FPW = 2.0ft

EPH-1



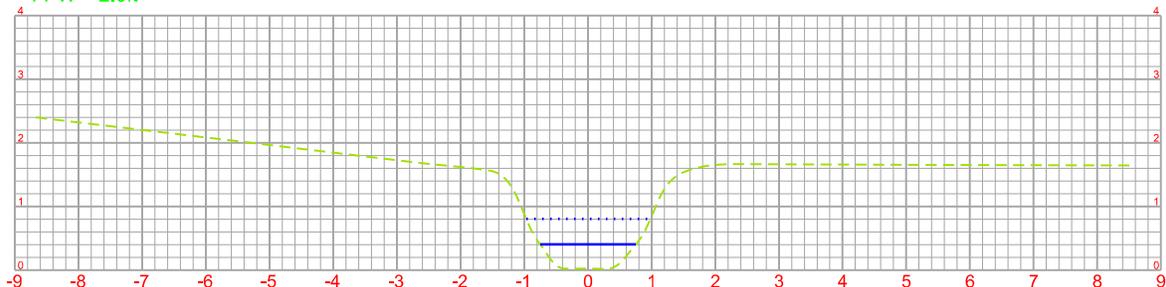
BFW = 1.25ft
BFD max = 0.25ft
FPW = 1.5ft

EPH-2



BFW = 1.5ft
BFD max = 0.4ft
FPW = 2.0ft

EPH-3



Cross Section Scale: 1"=3'

T.H.E.
Engineers, Inc.

PROJECT: P. RIDGE-NORTH PIT MINE SITE

STREAM: INT-4, EPH-1, EPH-2, EPH-3, EPH-4

COUNTY: DAVIESS

STATE: KENTUCKY

NEAR: PLEASANT RIDGE

EXISTING CROSS SECTIONS

EXHIBIT 8

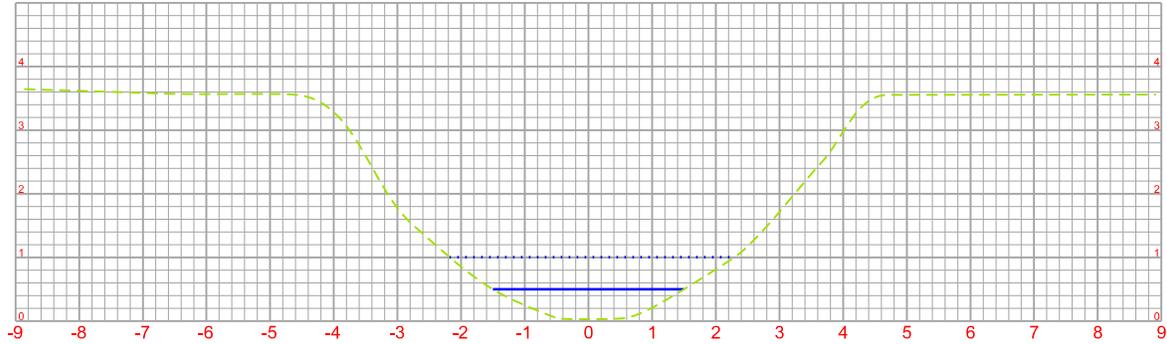
DATE:

Existing Ephemeral (EPH) Cross Sections

BF=Bankfull ———
 FP= Floodprone
 Existing Ground - - - -

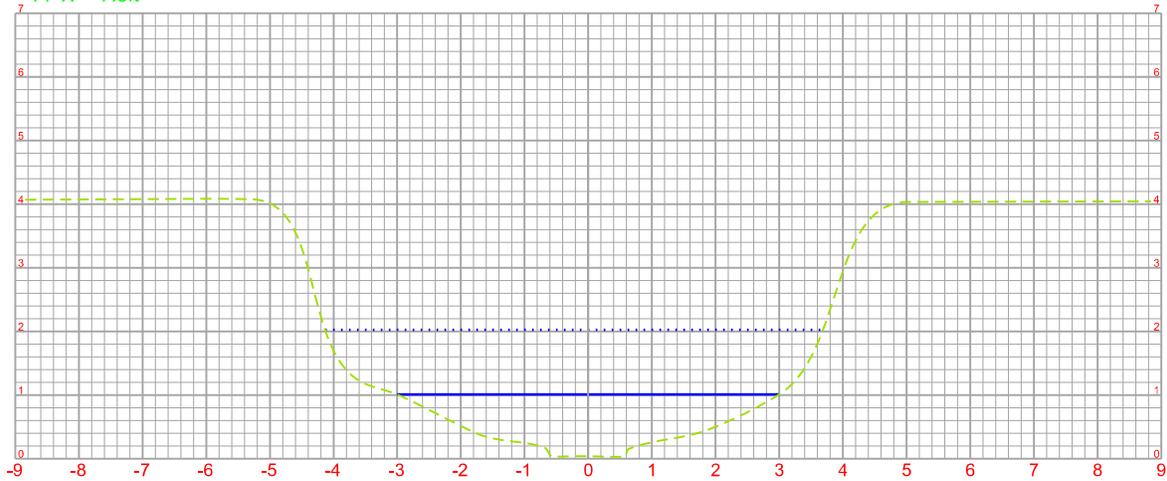
BFW = 3.0ft
 BFD max = 0.5ft
 FPW = 4.5ft

EPH-4



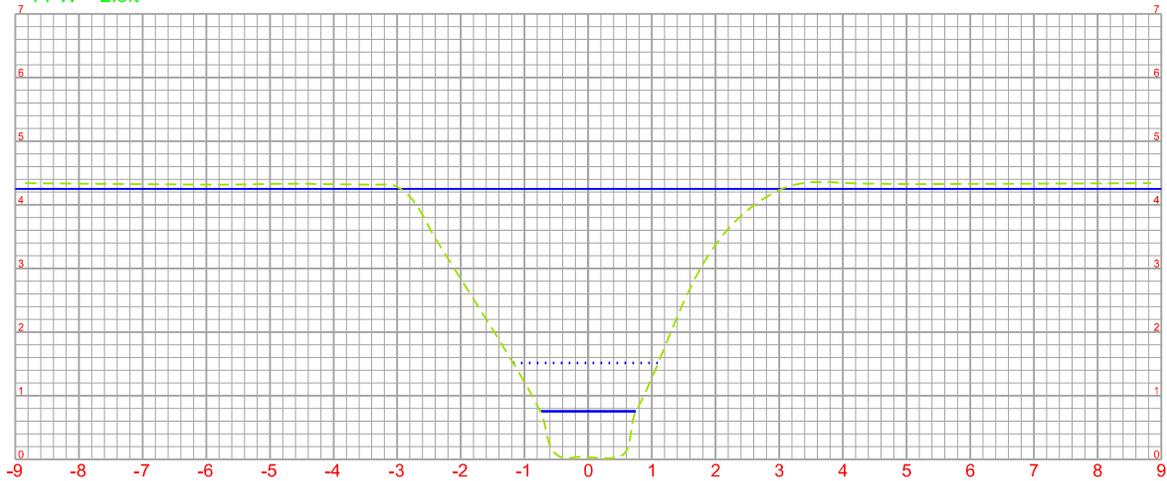
BFW = 6.0ft
 BFD max = 1.0ft
 FPW = 7.8ft

EPH-5



BFW = 1.5ft
 BFD max = 0.75ft
 FPW = 2.3ft

EPH-6



Cross Section Scale: 1"=3'

T.H.E. Engineers, Inc.	PROJECT: P. RIDGE-NORTH PIT MINE SITE			STREAM: EPH-4, EPH-5, EPH-6	
	COUNTY: DAVIESS	STATE: KENTUCKY	NEAR: PLEASANT RIDGE	EXISTING CROSS SECTIONS	EXHIBIT 9

DATE:

VIII. APPENDIX

- EPA Rapid Bioassessment Protocol Field Data Sheets
 - Photographs
- Wetland Delineation Forms
 - Photographs

Low Gradient Stream Data Sheet

STREAM NAME: <i>I-1</i>			LOCATION: <i>P Ridge Processing</i>		
STATION: <i>WP 1864</i>		DRAINAGE AREA (AC)	BASIN/WATERSHED: <i>Rough River/Barnett Creek</i>		
LAT: <i>37° 34' 52.3"</i>		LONG: <i>87° 00' 07.3"</i>	COUNTY: <i>Daviess/Ohio</i> USGS 7.5 TOPO:		
DATE: <i>1-23-13</i>		TIME: 11:10 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	INVESTIGATORS: <i>Laura Heil and Peggy Measel</i>		
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.					
WEATHER: Now _____ Past 24 hours _____ Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<input type="checkbox"/> Heavy rain <input type="checkbox"/> Steady rain <input type="checkbox"/> Intermittent showers <input checked="" type="checkbox"/> Clear/sunny/overcast Appr. Air Temp. <u>30</u> °F. Inches rainfall in past 24 hours _____ in _____ % Cloud Cover <u>20</u>					
P-Chem: Temp (°F) <u>36</u> D.O. (mg/l) _____ % Saturation _____ pH(S.U.) _____ Cond. <u>305</u> <input type="checkbox"/> Grab					
INSTREAM WATERSHED FEATURES (at time of assessment):			LOCAL WATERSHED FEATURES:		
Stream Width EOW <u>1.0</u> ft Stream Width BF <u>1.5</u> ft Stream Bottom Width <u>1.0</u> ft Avg. Bankfull Depth <u>0.3</u> ft Avg. H ₂ O Depth Riffle _____ ft			Predominant Surrounding Land Use: <input type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input type="checkbox"/> Forest <input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Pasture/Grazing <input type="checkbox"/> Oil Wells <input type="checkbox"/> Industrial <input type="checkbox"/> Silviculture <input type="checkbox"/> Land Disposal <input type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers		
Hydraulic Structures: <input type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments <input type="checkbox"/> Island <input type="checkbox"/> Waterfalls <input type="checkbox"/> Other <input type="checkbox"/> Culverts		Stream Flow: <input type="checkbox"/> Dry <input type="checkbox"/> Pooled <input type="checkbox"/> Low <input checked="" type="checkbox"/> Normal <input type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		Stream Type: <input type="checkbox"/> Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/> Seep	
Riparian Vegetation: Dominate Type: <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input checked="" type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous Number of Strata: <u>4</u>		Dom. Tree/Shrub Taxa: <i>Red maple</i> <i>Black willow</i>		Canopy Cover: <input type="checkbox"/> Fully Exposed (0-25%) <input checked="" type="checkbox"/> Partially Exposed (25-50%) <input type="checkbox"/> Partially Shaded (50-75%) <input type="checkbox"/> Fully Shaded (75-100%)	
Channel Alterations: <input type="checkbox"/> Dredging <input type="checkbox"/> Channelization (<input type="checkbox"/> Full <input type="checkbox"/> Partial)					
Substrate <input checked="" type="checkbox"/> Est. <input type="checkbox"/> P.C		Riffle _____ %		Run <u>100</u> %	
Silt/Clay (<0.06 mm / <0.002 in)				<u>90</u>	
Sand (0.06 - 2 mm / 0.002 - 0.08 in)				<u>10</u>	
Gravel (2 - 64 mm / 0.08 - 2.5 in)					
Cobble (64 - 256 mm / 2.5 - 10.1 in)					
Boulders (>256 mm / >10.1 in)					
Bedrock					
Habitat		Condition Category			
Parameter		Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat" lack of habitat is obvious; substrate unstable or lacking.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate/ Characterization		Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Availability		Even mix of large shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep, very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3-4 times longer than if it was a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2-3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2-1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, “raw” areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities has impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

103

NOTES/COMMENTS:

Low Gradient Stream Data Sheet

STREAM NAME: <i>I-2 Upstream</i>			LOCATION: <i>P Ridge Processing</i>		
STATION: <i>WP 387</i>		DRAINAGE AREA (AC)	BASIN/WATERSHED: <i>Rough River/Barnett Creek</i>		
LAT: <i>37° 35' 16.9"</i>		LONG: <i>87° 00' 09.2"</i>	COUNTY: <i>Daviess/Ohio</i> USGS 7.5 TOPO:		
DATE: <i>2-26-13</i>		TIME: 10:33 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	INVESTIGATORS: <i>Bill Sampson, John Bottom</i>		
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.					
WEATHER: Now _____ Past 24 hours _____ Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
<input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> Steady rain <input checked="" type="checkbox"/> Intermittent showers <input type="checkbox"/> Clear/sunny/overcast Appr. Air Temp. <u>48</u> °F. Inches rainfall in past 24 hours <u>.5+</u> in _____ % Cloud Cover					
P-Chem: Temp (°F) <u>42.4</u> D.O. (mg/l) _____ % Saturation _____ pH(S.U.) _____ Cond. <u>136.5</u> <input type="checkbox"/> Grab Rain					
INSTREAM WATERSHED			LOCAL WATERSHED FEATURES:		
FEATURES (at time of assessment):			Predominant Surrounding Land Use:		
Stream Width EOW <u>9.0</u> ft			<input type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input type="checkbox"/> Forest		
Stream Width BF <u>9.0</u> ft			<input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Pasture/Grazing		
Stream Bottom Width <u>3-4</u> ft			<input type="checkbox"/> Oil Wells <input type="checkbox"/> Industrial <input type="checkbox"/> Silviculture		
Avg. Bankfull Depth <u>1.0</u> ft			<input type="checkbox"/> Land Disposal <input checked="" type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers		
Avg. H ₂ O Depth Riffle _____ ft					
Hydraulic Structures:		Stream Flow:		Stream Type:	
<input type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments <input type="checkbox"/> Island <input type="checkbox"/> Waterfalls <input type="checkbox"/> Other <input checked="" type="checkbox"/> Culverts		<input type="checkbox"/> Dry <input type="checkbox"/> Pooled <input type="checkbox"/> Low <input type="checkbox"/> Normal <input checked="" type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		<input type="checkbox"/> Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/> Seep	
Riparian Vegetation:		Dom. Tree/Shrub Taxa:	Canopy Cover:		Channel Alterations:
Dominate Type:		<i>Sycamore</i>	<input checked="" type="checkbox"/> Fully Exposed (0-25%)		<input type="checkbox"/> Dredging
<input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs		<i>Red maple</i>	<input type="checkbox"/> Partially Exposed (25-50%)		<input type="checkbox"/> Channelization
<input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous			<input type="checkbox"/> Partially Shaded (50-75%)		(<input type="checkbox"/> Full <input type="checkbox"/> Partial)
Number of Strata: <u>3</u>			<input type="checkbox"/> Fully Shaded (75-100%)		
Substrate <input checked="" type="checkbox"/> Est. <input type="checkbox"/> P.C		Riffle _____ %	Run <u>100</u> %		Pool _____ %
Silt/Clay (<0.06 mm / <0.002 in)			<u>100</u>		
Sand (0.06 - 2 mm / 0.002 - 0.08 in)					
Gravel (2 - 64 mm / 0.08 - 2.5 in)					
Cobble (64 - 256 mm / 2.5 - 10.1 in)					
Boulders (>256 mm / >10.1 in)					
Bedrock					
Habitat		Condition Category			
Parameter		Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient.	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat" lack of habitat is obvious; substrate unstable or lacking.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate/ Characterization		Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Availability		Even mix of large shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large deep, very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3-4 times longer than if it was a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2-3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2-1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, “raw” areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities has impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

78

NOTES/COMMENTS: Channel incised/entrenched. Rosgen G_{6F} stream type.

Low Gradient Stream Data Sheet

STREAM NAME: <i>I-2 Downstream</i>			LOCATION: <i>P Ridge Processing</i>		
STATION: <i>WP 396</i>		DRAINAGE AREA (AC)	BASIN/WATERSHED: <i>Rough River/Barnett Creek</i>		
LAT: <i>37° 35' 00.2"</i>		LONG: <i>87° 00' 18.3"</i>	COUNTY: <i>Daviess/Ohio</i> USGS 7.5 TOPO:		
DATE: <i>2-26-13</i>		TIME: 11:46 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	INVESTIGATORS: <i>Bill Sampson, John Bottom</i>		
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.					
WEATHER: Now <input type="checkbox"/> Past 24 hours <input type="checkbox"/> Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
<input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> Steady rain <input checked="" type="checkbox"/> Intermittent showers <input type="checkbox"/> Clear/sunny/overcast Appr. Air Temp. <u>54</u> °F. Inches rainfall in past 24 hours <u>.5+</u> in <u>100</u> % Cloud Cover					
P-Chem: Temp (°F) <u>43.3</u> D.O. (mg/l) _____ % Saturation _____ pH(S.U.) _____ Cond. <u>128.1</u> <input type="checkbox"/> Grab Rain					
INSTREAM WATERSHED			LOCAL WATERSHED FEATURES:		
FEATURES (at time of assessment):			Predominant Surrounding Land Use:		
Stream Width EOW <u>12-15</u> ft			<input type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input type="checkbox"/> Forest		
Stream Width BF <u>15-16</u> ft			<input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input type="checkbox"/> Pasture/Grazing		
Stream Bottom Width <u>4-5</u> ft			<input type="checkbox"/> Oil Wells <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Silviculture		
Avg. Bankfull Depth <u>1.5</u> ft			<input type="checkbox"/> Land Disposal <input type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers		
Avg. H ₂ O Depth Riffle _____ ft					
Hydraulic Structures:		Stream Flow:		Stream Type:	
<input type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments <input type="checkbox"/> Island <input type="checkbox"/> Waterfalls <input type="checkbox"/> Other <input type="checkbox"/> Culverts		<input type="checkbox"/> Dry <input type="checkbox"/> Pooled <input type="checkbox"/> Low <input type="checkbox"/> Normal <input checked="" type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		<input type="checkbox"/> Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/> Seep	
Riparian Vegetation:		Dom. Tree/Shrub Taxa:	Canopy Cover:		Channel Alterations:
Dominate Type:		<i>Red maple</i>	<input checked="" type="checkbox"/> Fully Exposed (0-25%)		<input type="checkbox"/> Dredging
<input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs		<i>River birch</i>	<input type="checkbox"/> Partially Exposed (25-50%)		<input type="checkbox"/> Channelization
<input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous		<i>Beech</i>	<input type="checkbox"/> Partially Shaded (50-75%)		<input type="checkbox"/> Full <input type="checkbox"/> Partial
Number of Strata: <u>3</u>		<i>Pinoak</i>	<input type="checkbox"/> Fully Shaded (75-100%)		
		<i>Spicebush</i>			
Substrate <input checked="" type="checkbox"/> Est. <input type="checkbox"/> P.C		Riffle _____ %	Run <u>75</u> %		Pool <u>25</u> %
Silt/Clay (<0.06 mm / <0.002 in)			<u>90</u>		<u>90</u>
Sand (0.06 - 2 mm / 0.002 - 0.08 in)			<u>5</u>		<u>10</u>
Gravel (2 - 64 mm / 0.08 - 2.5 in)			<u>5</u>		
Cobble (64 - 256 mm / 2.5 - 10.1 in)					
Boulders (>256 mm / >10.1 in)					
Bedrock					
Habitat		Condition Category			
Parameter		Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat" lack of habitat is obvious; substrate unstable or lacking.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate/ Characterization		Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Availability		Even mix of large shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools <u>are</u> deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3-4 times longer than if it was a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2-3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2-1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, “raw” areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities has impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

91

NOTES/COMMENTS: Area recently logged. Channel incised/entrenched. Rosgen F6 stream type.

Low Gradient Stream Data Sheet

STREAM NAME: <i>I-3</i>			LOCATION: <i>P Ridge Processing</i>						
STATION: <i>WP 1889</i>		DRAINAGE AREA (AC)	BASIN/WATERSHED: <i>Rough River/Barnett Creek</i>						
LAT: <i>37° 34' 51.0"</i>		LONG: <i>87° 00' 24.5"</i>	COUNTY: <i>Daviess/Ohio</i> USGS 7.5 TOPO:						
DATE: <i>1-23-13</i> TIME: 3:00 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM		INVESTIGATORS: <i>Laura Heil and Peggy Measel</i>							
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.									
WEATHER: Now <input type="checkbox"/> Past 24 hours <input type="checkbox"/> Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No									
<input type="checkbox"/> Heavy rain Appr. Air Temp. _____ °F. Inches rainfall in past 24 hours _____ in <input type="checkbox"/> Steady rain <input type="checkbox"/> Intermittent showers _____ % Cloud Cover <input checked="" type="checkbox"/> Clear/sunny/overcast									
P-Chem: Temp (°F) <i>38</i> D.O. (mg/l) _____ % Saturation _____ pH(S.U.) _____ Cond. <i>629</i> <input type="checkbox"/> Grab									
INSTREAM WATERSHED FEATURES (at time of assessment):			LOCAL WATERSHED FEATURES:						
Stream Width EOW <i>3.0</i> ft Stream Width BF <i>5.0</i> ft Stream Bottom Width <i>2.5</i> ft Avg. Bankfull Depth <i>0.5</i> ft Avg. H ₂ O Depth Riffle _____ ft			Predominant Surrounding Land Use: <input type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input type="checkbox"/> Forest <input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Pasture/Grazing <input type="checkbox"/> Oil Wells <input type="checkbox"/> Industrial <input type="checkbox"/> Silviculture <input type="checkbox"/> Land Disposal <input type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers						
Hydraulic Structures: <input checked="" type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments <input type="checkbox"/> Island <input type="checkbox"/> Waterfalls <input type="checkbox"/> Other <input type="checkbox"/> Culverts		Stream Flow: <input type="checkbox"/> Dry <input type="checkbox"/> Pooled <input type="checkbox"/> Low <input checked="" type="checkbox"/> Normal <input type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		Stream Type: <input type="checkbox"/> Perennial <input checked="" type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input type="checkbox"/> Seep					
Riparian Vegetation: Dominate Type: <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input checked="" type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous Number of Strata: <i>4</i>		Dom. Tree/Shrub Taxa: <i>Red maple</i> <i>Alders</i> <i>River birch</i> <i>Sycamore</i>		Canopy Cover: <input type="checkbox"/> Fully Exposed (0-25%) <input type="checkbox"/> Partially Exposed (25-50%) <input checked="" type="checkbox"/> Partially Shaded (50-75%) <input type="checkbox"/> Fully Shaded (75-100%)					
Channel Alterations: <input type="checkbox"/> Dredging <input checked="" type="checkbox"/> Channelization <input type="checkbox"/> Full <input checked="" type="checkbox"/> Partial <input type="checkbox"/> Beaver Dam									
Substrate <input checked="" type="checkbox"/> Est. <input type="checkbox"/> P.C		Riffle _____ %		Run <i>100</i> %					
Silt/Clay (<0.06 mm / <0.002 in)		<i>100</i>							
Sand (0.06 - 2 mm / 0.002 - 0.08 in)									
Gravel (2 - 64 mm / 0.08 - 2.5 in)									
Cobble (64 - 256 mm / 2.5 - 10.1 in)									
Boulders (>256 mm / >10.1 in)									
Bedrock									
Habitat		Condition Category							
Parameter		Optimal		Suboptimal		Marginal		Poor	
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).		30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).		10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.		Less than 10% stable habitat" lack of habitat is obvious; substrate unstable or lacking.	
SCORE		20 19 18 17 16		15 14 13 12 11		10 9 8 7 6		5 4 3 2 1 0	
2. Pool Substrate/ Characterization		Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.		Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.		All mud or clay or sand bottom; little or no root mat; no submerged vegetation.		Hard-pan clay or bedrock; no root mat or vegetation.	
SCORE		20 19 18 17 16		15 14 13 12 11		10 9 8 7 6		5 4 3 2 1 0	
3. Pool Availability		Even mix of large shallow, large-deep, small-shallow, small-deep pools present.		Majority of pools large-deep; very few shallow.		Shallow pools much more prevalent than deep pools.		Majority of pools small-shallow or pools absent.	
SCORE		20 19 18 17 16		15 14 13 12 11		10 9 8 7 6		5 4 3 2 1 0	

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3-4 times longer than if it was a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2-3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2-1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, “raw” areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities has impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

96

NOTES/COMMENTS:

Low Gradient Stream Data Sheet

STREAM NAME: <i>I-4</i>			LOCATION: <i>P Ridge Processing</i>		
STATION: <i>WP 787</i>		DRAINAGE AREA (AC)	BASIN/WATERSHED: <i>Rough River/Barnett Creek</i>		
LAT: <i>37° 34' 59.0"</i>		LONG: <i>87° 00' 17.6"</i>	COUNTY: <i>Daviess/Ohio</i> USGS 7.5 TOPO:		
DATE: <i>4-29-13</i>		TIME: <i>2:24</i>	<input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	INVESTIGATORS: <i>Bill Sampson, Laura Heil</i>	
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.					
WEATHER: Now <input type="checkbox"/> Past 24 hours <input type="checkbox"/> Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input type="checkbox"/> No					
<input type="checkbox"/> Heavy rain <input type="checkbox"/> Steady rain <input checked="" type="checkbox"/> Intermittent showers <input type="checkbox"/> Clear/sunny/overcast					
Appr. Air Temp. <i>70</i> °F. Inches rainfall in past 24 hours <i>0.2</i> in					
<i>15</i> % Cloud Cover					
P-Chem: Temp (°F) <i>66.4</i> D.O. (mg/l) _____ % Saturation _____ pH(S.U.) <i>8.1</i> Cond. <i>219</i> <input type="checkbox"/> Grab					
INSTREAM WATERSHED			LOCAL WATERSHED FEATURES:		
FEATURES (at time of assessment):			Predominant Surrounding Land Use:		
Stream Width EOW <i>3.0</i> ft			<input checked="" type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input checked="" type="checkbox"/> Forest		
Stream Width BF <i>6.0</i> ft			<input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input type="checkbox"/> Pasture/Grazing		
Stream Bottom Width <i>1.0</i> ft			<input type="checkbox"/> Oil Wells <input type="checkbox"/> Industrial <input type="checkbox"/> Silviculture		
Avg. Bankfull Depth <i>1.0</i> ft			<input type="checkbox"/> Land Disposal <input type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers		
Avg. H ₂ O Depth Riffle <i>0.2</i> ft					
Hydraulic Structures:		Stream Flow:		Stream Type:	
<input type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments		<input type="checkbox"/> Dry <input type="checkbox"/> Pooled <input type="checkbox"/> Low <input checked="" type="checkbox"/> Normal		<input type="checkbox"/> Perennial <input checked="" type="checkbox"/> Intermittent	
<input type="checkbox"/> Island <input type="checkbox"/> Waterfalls		<input type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		<input type="checkbox"/> Ephemeral <input type="checkbox"/> Seep	
<input type="checkbox"/> Other <input type="checkbox"/> Culverts					
Riparian Vegetation:		Dom. Tree/Shrub Taxa:	Canopy Cover:		Channel Alterations:
Dominate Type:		<i>Sycamore</i>	<input type="checkbox"/> Fully Exposed (0-25%)		<input type="checkbox"/> Dredging
<input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs		<i>Sweetgum</i>	<input checked="" type="checkbox"/> Partially Exposed (25-50%)		<input type="checkbox"/> Channelization
<input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous		<i>Elm</i>	<input type="checkbox"/> Partially Shaded (50-75%)		<input type="checkbox"/> Full <input type="checkbox"/> Partial
Number of Strata: <i>3</i>		<i>Box elder</i>	<input type="checkbox"/> Fully Shaded (75-100%)		
<i>Red oak</i>					
Substrate <input checked="" type="checkbox"/> Est. <input type="checkbox"/> P.C		Riffle _____ %	Run <i>30</i> %		Pool <i>70</i> %
Silt/Clay (<0.06 mm / <0.002 in)			<i>50</i>		<i>50</i>
Sand (0.06 - 2 mm / 0.002 - 0.08 in)			<i>50</i>		<i>50</i>
Gravel (2 - 64 mm / 0.08 - 2.5 in)					
Cobble (64 - 256 mm / 2.5 - 10.1 in)					
Boulders (>256 mm / >10.1 in)					
Bedrock					
Habitat		Condition Category			
Parameter		Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient.	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat" lack of habitat is obvious; substrate unstable or lacking.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate/ Characterization		Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All sand or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Availability		Even mix of large shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3-4 times longer than if it was a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2-3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2-1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, “raw” areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities has impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

101

NOTES/COMMENTS: Recently logged. Rosgen E5/6f stream type.

Low Gradient Stream Data Sheet

STREAM NAME: <i>E-1</i>			LOCATION: <i>P Ridge Processing</i>		
STATION: <i>WP 1897</i>		DRAINAGE AREA (AC)	BASIN/WATERSHED: <i>Rough River/Barnett Creek</i>		
LAT: <i>37° 34' 48.6"</i>		LONG: <i>87° 02' 05.7"</i>	COUNTY: <i>Daviess/Ohio</i> USGS 7.5 TOPO:		
DATE: <i>1-23-13</i>		TIME: 2:30 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	INVESTIGATORS: <i>Laura Heil and Peggy Measel</i>		
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.					
WEATHER: Now <input type="checkbox"/> Past 24 hours <input type="checkbox"/> Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<input type="checkbox"/> Heavy rain <input type="checkbox"/> Steady rain <input type="checkbox"/> Intermittent showers <input checked="" type="checkbox"/> Clear/sunny/overcast Appr. Air Temp. <u>38</u> °F. Inches rainfall in past 24 hours <u> </u> in <u>0</u> % Cloud Cover					
P-Chem: Temp (°F) <u>39</u> D.O. (mg/l) <u> </u> % Saturation <u> </u> pH(S.U.) <u> </u> Cond. <u>526</u> <input type="checkbox"/> Grab					
INSTREAM WATERSHED FEATURES (at time of assessment):			LOCAL WATERSHED FEATURES:		
Stream Width EOW <u>1.0</u> ft Stream Width BF <u>1.5</u> ft Stream Bottom Width <u>1.0</u> ft Avg. Bankfull Depth <u>0.3</u> ft Avg. H ₂ O Depth Riffle <u> </u> ft			Predominant Surrounding Land Use: <input type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input type="checkbox"/> Forest <input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Pasture/Grazing <input type="checkbox"/> Oil Wells <input type="checkbox"/> Industrial <input type="checkbox"/> Silviculture <input type="checkbox"/> Land Disposal <input type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers		
Hydraulic Structures: <input type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments <input type="checkbox"/> Island <input type="checkbox"/> Waterfalls <input type="checkbox"/> Other <input type="checkbox"/> Culverts		Stream Flow: <input checked="" type="checkbox"/> Dry <input checked="" type="checkbox"/> Pooled <input type="checkbox"/> Low <input type="checkbox"/> Normal <input type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		Stream Type: <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/> Seep	
Riparian Vegetation: Dominate Type: <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input checked="" type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous Number of Strata: <u>4</u>		Dom. Tree/Shrub Taxa: <i>Red maple</i> <i>Sweetgum</i> <i>Honeysuckle</i>		Canopy Cover: <input type="checkbox"/> Fully Exposed (0-25%) <input type="checkbox"/> Partially Exposed (25-50%) <input checked="" type="checkbox"/> Partially Shaded (50-75%) <input type="checkbox"/> Fully Shaded (75-100%)	
Channel Alterations: <input type="checkbox"/> Dredging <input type="checkbox"/> Channelization (<input type="checkbox"/> Full <input type="checkbox"/> Partial)					
Substrate <input checked="" type="checkbox"/> Est. <input type="checkbox"/> P.C		Riffle <u> </u> %		Run <u>80</u> %	
Silt/Clay (<0.06 mm / <0.002 in)				<u>10</u>	
Sand (0.06 - 2 mm / 0.002 - 0.08 in)				<u>10</u>	
Gravel (2 - 64 mm / 0.08 - 2.5 in)				<u>80</u>	
Cobble (64 - 256 mm / 2.5 - 10.1 in)				<u>20</u>	
Boulders (>256 mm / >10.1 in)					
Bedrock					
Habitat		Condition Category			
Parameter		Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat" lack of habitat is obvious; substrate unstable or lacking.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate/ Characterization		Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Availability		Even mix of large shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep, very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3-4 times longer than if it was a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2-3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2-1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, “raw” areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities has impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

102

NOTES/COMMENTS:

Low Gradient Stream Data Sheet

STREAM NAME: <i>E-2</i>			LOCATION: <i>P Ridge Processing</i>		
STATION: <i>WP 1901</i>		DRAINAGE AREA (AC)	BASIN/WATERSHED: <i>Rough River/Barnett Creek</i>		
LAT: <i>37° 34' 50.1"</i>		LONG: <i>87° 02' 01.5"</i>	COUNTY: <i>Daviess/Ohio</i> USGS 7.5 TOPO:		
DATE: <i>1-23-13</i>		TIME: <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	INVESTIGATORS: <i>Laura Heil and Peggy Measel</i>		
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.					
WEATHER: Now <input type="checkbox"/> Past 24 hours <input type="checkbox"/> Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<input type="checkbox"/> Heavy rain <input type="checkbox"/> Steady rain <input type="checkbox"/> Intermittent showers <input checked="" type="checkbox"/> Clear/sunny/overcast Appr. Air Temp. <u>40</u> °F. Inches rainfall in past 24 hours _____ in _____ % Cloud Cover					
P-Chem: Temp (°F) <u>41</u> D.O. (mg/l) _____ % Saturation _____ pH(S.U.) _____ Cond. <u>1581</u> <input type="checkbox"/> Grab					
INSTREAM WATERSHED FEATURES (at time of assessment):			LOCAL WATERSHED FEATURES:		
Stream Width EOW <u>0.9</u> ft Stream Width BF <u>1.25</u> ft Stream Bottom Width <u>0.8</u> ft Avg. Bankfull Depth <u>0.25</u> ft Avg. H ₂ O Depth Riffle _____ ft			Predominant Surrounding Land Use: <input type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input type="checkbox"/> Forest <input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Pasture/Grazing <input type="checkbox"/> Oil Wells <input type="checkbox"/> Industrial <input type="checkbox"/> Silviculture <input type="checkbox"/> Land Disposal <input type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers		
Hydraulic Structures: <input type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments <input type="checkbox"/> Island <input type="checkbox"/> Waterfalls <input type="checkbox"/> Other <input type="checkbox"/> Culverts		Stream Flow: <input checked="" type="checkbox"/> Dry <input checked="" type="checkbox"/> Pooled <input type="checkbox"/> Low <input type="checkbox"/> Normal <input type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		Stream Type: <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/> Seep	
Riparian Vegetation: Dominate Type: <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input checked="" type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous Number of Strata: <u>4</u>		Dom. Tree/Shrub Taxa: <i>Red maple</i> <i>Black locust</i>		Canopy Cover: <input type="checkbox"/> Fully Exposed (0-25%) <input checked="" type="checkbox"/> Partially Exposed (25-50%) <input type="checkbox"/> Partially Shaded (50-75%) <input type="checkbox"/> Fully Shaded (75-100%)	
Channel Alterations: <input type="checkbox"/> Dredging <input type="checkbox"/> Channelization (<input type="checkbox"/> Full <input type="checkbox"/> Partial)					
Substrate <input checked="" type="checkbox"/> Est. <input type="checkbox"/> P.C		Riffle _____ %		Run <u>100</u> %	
Silt/Clay (<0.06 mm / <0.002 in)				<u>10</u>	
Sand (0.06 - 2 mm / 0.002 - 0.08 in)				<u>10</u>	
Gravel (2 - 64 mm / 0.08 - 2.5 in)				<u>80</u>	
Cobble (64 - 256 mm / 2.5 - 10.1 in)					
Boulders (>256 mm / >10.1 in)					
Bedrock					
Habitat		Condition Category			
Parameter		Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient.	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat" lack of habitat is obvious; substrate unstable or lacking.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate/ Characterization		Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Availability		Even mix of large shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3-4 times longer than if it was a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2-3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2-1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, “raw” areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities has impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

71

NOTES/COMMENTS:

Low Gradient Stream Data Sheet

STREAM NAME: <i>E-3</i>			LOCATION: <i>P Ridge Processing</i>		
STATION: WP 1878		DRAINAGE AREA (AC)	BASIN/WATERSHED: <i>Rough River/Barnett Creek</i>		
LAT: <i>37° 34' 54.2"</i>		LONG: <i>87° 00' 13.5"</i>	COUNTY: <i>Daviess/Ohio</i> USGS 7.5 TOPO:		
DATE: <i>1-23-13</i>		TIME: <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	INVESTIGATORS: <i>Laura Heil and Peggy Measel</i>		
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.					
WEATHER: Now <input type="checkbox"/> Past 24 hours <input type="checkbox"/> Has there been a heavy rain in the last 7 days? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
<input type="checkbox"/> Heavy rain <input type="checkbox"/> Steady rain <input type="checkbox"/> Intermittent showers <input checked="" type="checkbox"/> Clear/sunny/overcast Appr. Air Temp. <u>30</u> °F. Inches rainfall in past 24 hours <u> </u> in <u>0</u> % Cloud Cover					
P-Chem: Temp (°F) <u>39</u> D.O. (mg/l) <u> </u> % Saturation <u> </u> pH(S.U.) <u> </u> Cond. <u>388</u> <input type="checkbox"/> Grab					
INSTREAM WATERSHED FEATURES (at time of assessment):			LOCAL WATERSHED FEATURES:		
Stream Width EOW <u>0.5</u> ft Stream Width BF <u>1.5</u> ft Stream Bottom Width <u>1.0</u> ft Avg. Bankfull Depth <u>0.4</u> ft Avg. H ₂ O Depth Riffle <u> </u> ft			Predominant Surrounding Land Use: <input type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input type="checkbox"/> Forest <input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Pasture/Grazing <input type="checkbox"/> Oil Wells <input type="checkbox"/> Industrial <input type="checkbox"/> Silviculture <input type="checkbox"/> Land Disposal <input type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers		
Hydraulic Structures: <input type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments <input type="checkbox"/> Island <input type="checkbox"/> Waterfalls <input type="checkbox"/> Other <input type="checkbox"/> Culverts		Stream Flow: <input checked="" type="checkbox"/> Dry <input checked="" type="checkbox"/> Pooled <input type="checkbox"/> Low <input type="checkbox"/> Normal <input type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		Stream Type: <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/> Seep	
Riparian Vegetation: Dominate Type: <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input checked="" type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous Number of Strata: <u>4</u>		Dom. Tree/Shrub Taxa: <i>Honey locust</i>		Canopy Cover: <input type="checkbox"/> Fully Exposed (0-25%) <input type="checkbox"/> Partially Exposed (25-50%) <input checked="" type="checkbox"/> Partially Shaded (50-75%) <input type="checkbox"/> Fully Shaded (75-100%)	
Channel Alterations: <input type="checkbox"/> Dredging <input type="checkbox"/> Channelization (<input type="checkbox"/> Full <input type="checkbox"/> Partial)		Substrate <input checked="" type="checkbox"/> Est. <input type="checkbox"/> P.C. Riffle <u>10</u> % Run <u>70</u> % Pool <u>20</u> %			
Silt/Clay (<0.06 mm / <0.002 in)		<u>20</u>		<u>50</u>	
Sand (0.06 - 2 mm / 0.002 - 0.08 in)		<u>30</u>		<u>10</u>	
Gravel (2 - 64 mm / 0.08 - 2.5 in)		<u>50</u>		<u>40</u>	
Cobble (64 - 256 mm / 2.5 - 10.1 in)					
Boulders (>256 mm / >10.1 in)					
Bedrock					
Habitat		Condition Category			
Parameter		Optimal	Suboptimal		Marginal
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).		10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.
SCORE		20 19 18 17 16	15 14 13 12 11		10 9 8 7 6
2. Pool Substrate/ Characterization		Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.		All mud or clay or sand bottom; little or no root mat; no submerged vegetation.
SCORE		20 19 18 17 16	15 14 13 12 11		10 9 8 7 6
3. Pool Availability		Even mix of large shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep, very few shallow.		Shallow pools much more prevalent than deep pools.
SCORE		20 19 18 17 16	15 14 13 12 11		10 9 8 7 6

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3-4 times longer than if it was a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2-3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2-1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, “raw” areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities has impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

90

NOTES/COMMENTS:

Low Gradient Stream Data Sheet

STREAM NAME: <i>E-4</i>			LOCATION: <i>P Ridge Processing</i>		
STATION: <i>WP 391</i>	DRAINAGE AREA (AC)		BASIN/WATERSHED: <i>Rough River/Barnett Creek</i>		
LAT: <i>37° 35' 06.98"</i>		LONG: <i>87° 00' 08.0"</i>	COUNTY: <i>Daviess/Ohio</i> USGS 7.5 TOPO:		
DATE: <i>2-26-13</i>		TIME: 10:00 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	INVESTIGATORS: <i>Bill Sampson, John Bottom</i>		
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.					
WEATHER: Now <input type="checkbox"/> Past 24 hours <input type="checkbox"/> Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
<input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> Steady rain <input checked="" type="checkbox"/> Intermittent showers <input type="checkbox"/> Clear/sunny/overcast Appr. Air Temp. <u>54</u> °F. Inches rainfall in past 24 hours <u>.5+</u> in <input checked="" type="checkbox"/> 100 % Cloud Cover					
P-Chem: Temp (°F) <u>45.1</u> D.O. (mg/l) _____ % Saturation _____ pH(S.U.) _____ Cond. <u>373</u> <input type="checkbox"/> Grab Rain					
INSTREAM WATERSHED			LOCAL WATERSHED FEATURES:		
FEATURES (at time of assessment): Stream Width EOW <u>2.0</u> ft Stream Width BF <u>3.0</u> ft Stream Bottom Width <u>1.0</u> ft Avg. Bankfull Depth <u>.5</u> ft Avg. H ₂ O Depth Riffle <u>-</u> ft			Predominant Surrounding Land Use: <input type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input type="checkbox"/> Forest <input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input type="checkbox"/> Pasture/Grazing <input type="checkbox"/> Oil Wells <input type="checkbox"/> Industrial <input type="checkbox"/> Silviculture <input type="checkbox"/> Land Disposal <input checked="" type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers		
Hydraulic Structures: <input type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments <input type="checkbox"/> Island <input type="checkbox"/> Waterfalls <input type="checkbox"/> Other <input type="checkbox"/> Culverts		Stream Flow: <input type="checkbox"/> Dry <input type="checkbox"/> Pooled <input type="checkbox"/> Low <input type="checkbox"/> Normal <input checked="" type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		Stream Type: <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/> Seep	
Riparian Vegetation: Dominate Type: <input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous Number of Strata: <u>3</u>		Dom. Tree/Shrub Taxa: <i>River birch</i> <i>Sycamore</i> <i>Red maple</i> <i>Alder</i>		Canopy Cover: <input checked="" type="checkbox"/> Fully Exposed (0-25%) <input type="checkbox"/> Partially Exposed (25-50%) <input type="checkbox"/> Partially Shaded (50-75%) <input type="checkbox"/> Fully Shaded (75-100%)	
Channel Alterations: <input type="checkbox"/> Dredging <input type="checkbox"/> Channelization (<input type="checkbox"/> Full <input type="checkbox"/> Partial)					
Substrate <input checked="" type="checkbox"/> Est. <input type="checkbox"/> P.C		Riffle _____ %		Run <u>70</u> %	
Pool <u>30</u> %					
Silt/Clay (<0.06 mm / <0.002 in)				<u>90</u>	
Sand (0.06 - 2 mm / 0.002 - 0.08 in)				<u>5</u>	
Gravel (2 - 64 mm / 0.08 - 2.5 in)				<u>5</u>	
Cobble (64 - 256 mm / 2.5 - 10.1 in)					
Boulders (>256 mm / >10.1 in)					
Bedrock					
Habitat		Condition Category			
Parameter		Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient.	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat" lack of habitat is obvious; substrate unstable or lacking.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate/ Characterization		Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Availability		Even mix of large shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large deep, very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3-4 times longer than if it was a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2-3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2-1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, “raw” areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities has impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

84

NOTES/COMMENTS: Channel incised/entrenched. Rosgen G6 stream type.

Low Gradient Stream Data Sheet

STREAM NAME: <i>E-5</i>			LOCATION: <i>P Ridge Processing</i>		
STATION: <i>WP 386</i>		DRAINAGE AREA (AC)	BASIN/WATERSHED: <i>Rough River/Barnett Creek</i>		
LAT: <i>37° 35' 11.8"</i>		LONG: <i>87° 00' 08.7"</i>	COUNTY: <i>Daviess/Ohio</i> USGS 7.5 TOPO:		
DATE: <i>2-26-13</i>		TIME: 10:00 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	INVESTIGATORS: <i>Bill Sampson, John Bottom</i>		
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.					
WEATHER: Now <input type="checkbox"/> Past 24 hours <input type="checkbox"/> Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
<input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> Steady rain <input checked="" type="checkbox"/> Intermittent showers <input type="checkbox"/> Clear/sunny/overcast Appr. Air Temp. <u>45</u> °F. Inches rainfall in past 24 hours <u>.5+</u> in <input checked="" type="checkbox"/> 100 % Cloud Cover					
P-Chem: Temp (°F) <u>42.6</u> D.O. (mg/l) _____ % Saturation _____ pH(S.U.) _____ Cond. <u>60.8</u> <input type="checkbox"/> Grab Rain					
INSTREAM WATERSHED			LOCAL WATERSHED FEATURES:		
FEATURES (at time of assessment):			Predominant Surrounding Land Use:		
Stream Width EOW <u>4.0</u> ft			<input type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input type="checkbox"/> Forest		
Stream Width BF <u>6.0</u> ft			<input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Pasture/Grazing		
Stream Bottom Width <u>1-1.5</u> ft			<input type="checkbox"/> Oil Wells <input type="checkbox"/> Industrial <input type="checkbox"/> Silviculture		
Avg. Bankfull Depth <u>1.0</u> ft			<input type="checkbox"/> Land Disposal <input checked="" type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers		
Avg. H ₂ O Depth Riffle <u>-</u> ft					
Hydraulic Structures:		Stream Flow:		Stream Type:	
<input type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments <input type="checkbox"/> Island <input type="checkbox"/> Waterfalls <input type="checkbox"/> Other <input checked="" type="checkbox"/> Culverts		<input type="checkbox"/> Dry <input type="checkbox"/> Pooled <input type="checkbox"/> Low <input type="checkbox"/> Normal <input checked="" type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		<input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/> Seep	
Riparian Vegetation:		Dom. Tree/Shrub Taxa:	Canopy Cover:		Channel Alterations:
Dominate Type:		<i>Redcedar</i>	<input checked="" type="checkbox"/> Fully Exposed (0-25%)		<input type="checkbox"/> Dredging
<input checked="" type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs		<i>Sycamore</i>	<input type="checkbox"/> Partially Exposed (25-50%)		<input type="checkbox"/> Channelization
<input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous		<i>Red maple</i>	<input type="checkbox"/> Partially Shaded (50-75%)		<input type="checkbox"/> Full <input type="checkbox"/> Partial
Number of Strata: <u>3</u>		<i>Sweetgum</i>	<input type="checkbox"/> Fully Shaded (75-100%)		
Substrate <input checked="" type="checkbox"/> Est. <input type="checkbox"/> P.C		Riffle _____ %	Run <u>100</u> %		Pool _____ %
Silt/Clay (<0.06 mm / <0.002 in)			<u>100</u>		
Sand (0.06 - 2 mm / 0.002 - 0.08 in)					
Gravel (2 - 64 mm / 0.08 - 2.5 in)					
Cobble (64 - 256 mm / 2.5 - 10.1 in)					
Boulders (>256 mm / >10.1 in)					
Bedrock					
Habitat		Condition Category			
Parameter		Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat" lack of habitat is obvious; substrate unstable or lacking.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate/ Characterization		Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Availability		Even mix of large shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3-4 times longer than if it was a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2-3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2-1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, “raw” areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities has impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

73

NOTES/COMMENTS: Channel incised/entrenched. Rosgen G6 stream type.

Low Gradient Stream Data Sheet

STREAM NAME: <i>E-6</i>			LOCATION: <i>P Ridge Processing</i>		
STATION: <i>WP 389</i>		DRAINAGE AREA (AC)	BASIN/WATERSHED: <i>Rough River/Barnett Creek</i>		
LAT: <i>37° 35' 17.6"</i>		LONG: <i>87° 00' 09.8"</i>	COUNTY: <i>Daviess/Ohio</i> USGS 7.5 TOPO:		
DATE: <i>2-26-13</i>		TIME: 10:15 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	INVESTIGATORS: <i>Bill Sampson, John Bottom</i>		
TYPE SAMPLE: <input type="checkbox"/> P-CHEM <input type="checkbox"/> Macroinvertebrate <input type="checkbox"/> FISH <input type="checkbox"/> BACT.					
WEATHER: Now <input type="checkbox"/> Past 24 hours <input type="checkbox"/> Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
<input type="checkbox"/> Heavy rain <input checked="" type="checkbox"/> Steady rain Appr. Air Temp. <i>45</i> °F. Inches rainfall in past 24 hours <i>.5+</i> in					
<input type="checkbox"/> Intermittent showers <i>100</i> % Cloud Cover					
<input checked="" type="checkbox"/> Clear/sunny/overcast					
P-Chem: Temp (°F) <i>44.6</i> D.O. (mg/l) _____ % Saturation _____ pH(S.U.) _____ Cond. <i>55.51</i> <input type="checkbox"/> Grab Rain					
INSTREAM WATERSHED			LOCAL WATERSHED FEATURES:		
FEATURES (at time of assessment):			Predominant Surrounding Land Use:		
Stream Width EOW <i>1.2</i> ft			<input type="checkbox"/> Surface Mining <input type="checkbox"/> Construction <input type="checkbox"/> Forest		
Stream Width BF <i>1.5</i> ft			<input type="checkbox"/> Deep Mining <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Pasture/Grazing		
Stream Bottom Width <i>1.0</i> ft			<input type="checkbox"/> Oil Wells <input type="checkbox"/> Industrial <input type="checkbox"/> Silviculture		
Avg. Bankfull Depth <i>.75</i> ft			<input type="checkbox"/> Land Disposal <input checked="" type="checkbox"/> Row Crops <input type="checkbox"/> Urban Runoff/Storm Sewers		
Avg. H ₂ O Depth Riffle <i>-</i> ft					
Hydraulic Structures:		Stream Flow:		Stream Type:	
<input type="checkbox"/> Dams <input type="checkbox"/> Bridge Abutments		<input type="checkbox"/> Dry <input type="checkbox"/> Pooled <input type="checkbox"/> Low <input type="checkbox"/> Normal		<input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent	
<input type="checkbox"/> Island <input type="checkbox"/> Waterfalls		<input checked="" type="checkbox"/> High <input type="checkbox"/> Very Rapid or Torrential		<input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/> Seep	
<input type="checkbox"/> Other <input type="checkbox"/> Culverts					
Riparian Vegetation:		Dom. Tree/Shrub Taxa:	Canopy Cover:		Channel Alterations:
Dominate Type:		<i>Redcedar (two trees)</i>	<input checked="" type="checkbox"/> Fully Exposed (0-25%)		<input type="checkbox"/> Dredging
<input type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs			<input type="checkbox"/> Partially Exposed (25-50%)		<input type="checkbox"/> Channelization
<input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous			<input type="checkbox"/> Partially Shaded (50-75%)		<input type="checkbox"/> Full <input type="checkbox"/> Partial
Number of Strata: <i>2</i>			<input type="checkbox"/> Fully Shaded (75-100%)		
Substrate <input checked="" type="checkbox"/> Est. <input type="checkbox"/> P.C		Riffle _____ %	Run <i>100</i> %		Pool _____ %
Silt/Clay (<0.06 mm / <0.002 in)			<i>100</i>		
Sand (0.06 - 2 mm / 0.002 - 0.08 in)					
Gravel (2 - 64 mm / 0.08 - 2.5 in)					
Cobble (64 - 256 mm / 2.5 - 10.1 in)					
Boulders (>256 mm / >10.1 in)					
Bedrock					
Habitat		Condition Category			
Parameter		Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover		Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat" lack of habitat is obvious; substrate unstable or lacking.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Pool Substrate/ Characterization		Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Pool Availability		Even mix of large shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE		20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion of cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity	The bends in the stream increase the stream length 3-4 times longer than if it was a straight line. (Note – channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2-3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2-1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable, infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable, 30-60% of bank in reach has areas of erosion, high erosion potential during floods.	Unstable, many eroded areas, “raw” areas frequently along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruptive of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone).	Width of riparian zone > 18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities has impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score

69

NOTES/COMMENTS: Channel incised/entrenched. Rosgen G6 stream type.



Intermittent 1 (I-1) – Looking upstream



Intermittent 1 (I-1) – Looking downstream



Intermittent 2, Upstream Site (I-2US) – Looking upstream



Intermittent 2, Upstream Site (I-2US) – Looking downstream



Intermittent 2, Downstream Site (I-2DS) – Looking upstream



Intermittent 2, Downstream Site (I-2DS) – Looking downstream



Intermittent 3 (I-3) – Looking upstream to Pond1 (beaver dam at outlet)



Intermittent 4 (I-4) – Looking upstream



Intermittent 4 (I-4) – Looking downstream

Ephemeral 1 (E-1)



Ephemeral 2 (E-2)

Ephemeral 3 (E-3)



Ephemeral 4 (E-4)



Ephemeral 5 (E-5)

Ephemeral 6 (E-6)



WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont (DRAFT)

Project/Site: P Ridge Processing - Wetland A		City/County: Daviess/Ohio	Sampling Date: 1/23/13
Applicant/Owner: West KY Minerals		State: Kentucky	Sampling Point: WP 1862
Investigator(s): Laura Heil & Peggy Measel		Section, Township, Range:	
Landform (hillslope, terrace, etc.):		Local Relief: <input type="checkbox"/> concave <input type="checkbox"/> convex <input type="checkbox"/> none	
Slope: < 2%	Lat: 37° 34' 51.4"	Long: 87° 00' 06.0"	Datum:
Soil Map Unit: Fairpoint Series (FbD)		Cowardin Classification: PEM1B	
Are climatic/hydrologic conditions on the site typical for this time of year? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (if no, explain in Remarks.)			
Are Vegetation, Soil, or Hydrology significantly disturbed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Are "Normal Circumstances" present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Are Vegetation, Soil, or Hydrology naturally problematic? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		(If needed, explain in Remarks.)	

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the Sampled Area within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: Soils are disturbed	

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species that are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across all Strata: <u>6</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <i>Salix nigra</i> (black willow)	100	Yes	FACW+	
2.				
3.				
4.				
Sapling/Shrub Stratum (Plot Size: 15')				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL Species: _____ X 1 = _____ FACW Species: _____ X 2 = _____ FAC Species: _____ X 3 = _____ FACU Species: _____ X 4 = _____ UPL Species: _____ X 5 = _____ Column Totals: (A) _____ (B) _____ Prevalence Index = B/A = _____
1. <i>Salix nigra</i> (black willow)	80	Yes	FACW+	
2. <i>Acer rubrum</i> (red maple)	20	Yes	FAC	
3.				
4.				
Herbaceous Stratum (Plot Size: 5')				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide Supporting Data) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) <small>¹Indicators of hydric soil and wetland hydrology must be</small>
1. <i>Juncus effusus</i> (rush)	30	Yes	FACW	
2. <i>Solidago rugosa</i> (goldenrod)	20	Yes	FAC	
3. <i>Eupatorium sp.</i>	15	No	NI	
4. <i>Phragmites australis</i>	15	No	FACW	
5. <i>Panicum dichotomiflorum</i> (switchgrass)	20	Yes	FACW	
6.				
7.				
Woody Vine (Plot Size: -)				Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1.				
2.				
Remarks:				

Profile Description (Describe to the depth needed to document the indicator of confirm the absence of indicators.)								
Depth (in)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
								Soils have been disturbed;
								Hardpan present
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix								
Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2cm Muck (A10) (LRR N, MLRA 147,148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Polyvalue Below Surface (S8)(MLRA 147,148) <input type="checkbox"/> Thin Dark Surface (S9)(MLRA 147,148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Fe-Mn Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13)(LRR N, MLRA 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148)								
Indicators for Problematic Hydric Soils³ <input type="checkbox"/> 2 cm Muck (A10)(MLRA 147) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136,147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input checked="" type="checkbox"/> Other (Explain in Remarks)								
³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.								
Restrictive Layer (if observed): Type: Hard pan Depth (in): 8				Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Remarks: High water table and hard pan prevented pulling of sufficient soil sample, soils obviously disturbed. Could only pull an inch or so of sand and gravel from soil probe after pushing through hardpan and high water table. Assumed hydric soils in light of plants and hydrology that occur on-site.								

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input checked="" type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth (in): Water Table Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): Saturation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): (includes capillary fringe)		Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont (DRAFT)

Project/Site: P Ridge Processing - Wetland B		City/County: Daviess/Ohio	Sampling Date: 1/23/13
Applicant/Owner: West KY Minerals		State: Kentucky	Sampling Point: WP 1875
Investigator(s): Laura Heil & Peggy Measel		Section, Township, Range:	
Landform (hillslope, terrace, etc.):		Local Relief: <input type="checkbox"/> concave <input type="checkbox"/> convex <input type="checkbox"/> none	
Slope: < 2%	Lat: 37° 34' 51.2"	Long: 87° 00' 06.8"	Datum:
Soil Map Unit: Fairpoint Series		Cowardin Classification: PEMIB	
Are climatic/hydrologic conditions on the site typical for this time of year? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (if no, explain in Remarks.)			
Are Vegetation, <u>Soil</u> , or Hydrology significantly disturbed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Are "Normal Circumstances" present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Are Vegetation, Soil, or Hydrology naturally problematic? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		(If needed, explain in Remarks.)	

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the Sampled Area within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks:	

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species that are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across all Strata: <u>5</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>80</u> (A/B)
1. <i>Salix nigra</i> (black willow)	35	Yes	FACW	
2.				
3.				
4.				
Sapling/Shrub Stratum (Plot Size: 15')				Prevalence Index worksheet: <u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____ OBL Species: _____ X 1 = _____ FACW Species: _____ X 2 = _____ FAC Species: _____ X 3 = _____ FACU Species: _____ X 4 = _____ UPL Species: _____ X 5 = _____ Column Totals:(A) _____ (B) _____ Prevalence Index = B/A = _____
1. <i>Salix nigra</i> (black willow)	15	Yes	FACW	
2.				
3.				
4.				
Herbaceous Stratum (Plot Size: 5')				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide Supporting Data) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) <small>¹Indicators of hydric soil and wetland hydrology must be</small>
1. <i>Eupatorium serotinum</i> (thoroughwort)	10	Yes	FAC	
2. <i>Solidago canadum</i> (goldenrod)	10	Yes	FACU	
3. <i>Symphotrichum lateriflorum</i> (white aster)	10	Yes	FACW	
4. <i>Carex stipata</i> (Carex)	7	No	OBL	
5. <i>Panicum dichotomiflorum</i> (switchgrass)	8	No	FACW	
6. <i>Cirsium discolor</i> (Field thistle)	3	No	FACU	
7. <i>Juncus effusus</i> (rush)	2	No	FACW	
8.				
Woody Vine (Plot Size: -)				Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1.				
2.				
Remarks:				

Profile Description (Describe to the depth needed to document the indicator of confirm the absence of indicators.)								
Depth (in)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
								Soils have been disturbed;
								Hard pan present
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix								
Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2cm Muck (A10) (LRR N, MLRA 147,148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Polyvalue Below Surface (S8)(MLRA 147,148) <input type="checkbox"/> Thin Dark Surface (S9)(MLRA 147,148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input checked="" type="checkbox"/> Fe-Mn Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13)(LRR N, MLRA 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148)								
Indicators for Problematic Hydric Soils³ <input type="checkbox"/> 2 cm Muck (A10)(MLRA 147) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136,147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.								
Restrictive Layer (if observed): Type: None Depth (in):				Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Remarks: Unable to pull sample; in high water table probe comes up full of water rather than soils-2 inches gravel in probe, soils obviously disturbed.								

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)		<u>Secondary Indicators (minimum of two required)</u>	
<input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input checked="" type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input checked="" type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth (in): Water Table Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): Saturation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): (includes capillary fringe)		Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont (DRAFT)

Project/Site: P Ridge Processing - Wetland C1		City/County: Daviess/Ohio	Sampling Date: 1/23/13
Applicant/Owner: West KY Minerals		State: Kentucky	Sampling Point: WP 1880
Investigator(s): Laura Heil & Peggy Measel		Section, Township, Range:	
Landform (hillslope, terrace, etc.):		Local Relief: <input type="checkbox"/> concave <input type="checkbox"/> convex <input checked="" type="checkbox"/> none flat	
Slope: < 0%	Lat: 37° 34' 50.7"	Long: 87° 00' 24.6"	Datum:
Soil Map Unit: Loring silty clay loam (LrC3)		Cowardin Classification: PEM1F	
Are climatic/hydrologic conditions on the site typical for this time of year? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (if no, explain in Remarks.)			
Are Vegetation, Soil, or Hydrology significantly disturbed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Are "Normal Circumstances" present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Are Vegetation, Soil, or Hydrology naturally problematic? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		(If needed, explain in Remarks.)	

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p align="center">Is the Sampled Area within a Wetland?</p> <p align="center"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
Remarks:	

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <i>Acer rubrum</i> (red maple)	8	Yes	FAC	Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across all Strata: <u>2</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <i>Betula nigra</i> (river birch)	7	Yes	FACW	
3.				
4.				
5.				
Sapling/Shrub Stratum (Plot Size: 15')				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL Species: _____ X 1 = _____ FACW Species: _____ X 2 = _____ FAC Species: _____ X 3 = _____ FACU Species: _____ X 4 = _____ UPL Species: _____ X 5 = _____ Column Totals: (A) _____ (B) _____ Prevalence Index = B/A = _____
1. <i>Alnus serrulata</i> (hazel alder)	10	Yes	OBL	
2.				
3.				
4.				
5.				
Herbaceous Stratum (Plot Size: 5')				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide Supporting Data) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be
1. <i>Juncus effusus</i> (rush)	4	Yes	FACW	
2. <i>Ludwigia alternifolia</i> (seedbox)	5	No	FACW	
3. <i>Solidago rugosa</i> (goldenrod)	15	Yes	FAC	
4.				
5.				
6.				
7.				
8.				
Woody Vine (Plot Size: -)				Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1.				
2.				
Remarks:				

Profile Description (Describe to the depth needed to document the indicator of confirm the absence of indicators.)								
Depth (in)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 4/2	90	10YR 5/8	10	C	M	SiCl	Coal in sample
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix								
Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2cm Muck (A10) (LRR N, MLRA 147,148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Polyvalue Below Surface (S8)(MLRA 147,148) <input type="checkbox"/> Thin Dark Surface (S9)(MLRA 147,148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input checked="" type="checkbox"/> Fe-Mn Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13)(LRR N, MLRA 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148)								
Indicators for Problematic Hydric Soils³ <input type="checkbox"/> 2 cm Muck (A10)(MLRA 147) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136,147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.								
Restrictive Layer (if observed): Type: None Depth (in):					Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)			<u>Secondary Indicators (minimum of two required)</u>		
<input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input checked="" type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)			
Field Observations: Surface Water Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): Water Table Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): Saturation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): (includes capillary fringe)			Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					
Remarks:					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont (DRAFT)

Project/Site: P Ridge Processing - Wetland C2		City/County: Daviess/Ohio	Sampling Date: 1/23/13
Applicant/Owner: West KY Minerals		State: Kentucky	Sampling Point: WP 1896
Investigator(s): Laura Heil & Peggy Measel		Section, Township, Range:	
Landform (hillslope, terrace, etc.):		Local Relief: <input type="checkbox"/> concave <input type="checkbox"/> convex <input checked="" type="checkbox"/> none	
Slope: < 0%	Lat: 37° 34' 51.8"	Long: 87° 00' 23.8"	Datum:
Soil Map Unit: Loring silty clay loam (LrC3)		Cowardin Classification: PFO1F	
Are climatic/hydrologic conditions on the site typical for this time of year? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (if no, explain in Remarks.)			
Are Vegetation, Soil, or Hydrology significantly disturbed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Are "Normal Circumstances" present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Are Vegetation, Soil, or Hydrology naturally problematic? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		(If needed, explain in Remarks.)	

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p align="center">Is the Sampled Area within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
Remarks: Pond fringe	

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <i>Platanus occidentalis</i> (sycamore)	10	Yes	FACW	Number of Dominant Species that are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across all Strata: <u>6</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <i>Acer rubrum</i> (red maple)	25	Yes	FAC	
3. <i>Betula nigra</i> (river birch)	5	No	FACW	
4.				
5.				
Sapling/Shrub Stratum (Plot Size: 15')				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL Species: _____ X 1 = _____ FACW Species: _____ X 2 = _____ FAC Species: _____ X 3 = _____ FACU Species: _____ X 4 = _____ UPL Species: _____ X 5 = _____ Column Totals: (A) _____ (B) _____ Prevalence Index = B/A = _____
1. <i>Acer rubrum</i> (red maple)	15	Yes	FAC	
2. <i>Platanus occidentalis</i> (sycamore)	15	Yes	FACW	
3.				
4.				
5.				
Herbaceous Stratum (Plot Size: 5')				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide Supporting Data) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be
1. <i>Juncus effusus</i> (rush)	7	Yes	FACW	
2. <i>Carex scoparia</i> (sedge)	8	Yes	FACW	
3. <i>Ludwigia alternifolia</i> (seedbox)	5	No	FACW	
4. <i>Glyceria stricta</i> (mannagrass)	5	No	OBL	
5. <i>Bidens frondosa</i> (Tickseed)	5	No	FACW	
6.				
7.				
8.				
Woody Vine (Plot Size: -)				Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1.				
2.				
Remarks:				

Profile Description (Describe to the depth needed to document the indicator of confirm the absence of indicators.)								
Depth (in)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
	10YR 5/3	90	10YR 5/8	10	C	M	SiCl	
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix								
Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2cm Muck (A10) (LRR N, MLRA 147,148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Polyvalue Below Surface (S8)(MLRA 147,148) <input type="checkbox"/> Thin Dark Surface (S9)(MLRA 147,148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Fe-Mn Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13)(LRR N, MLRA 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148)								
Indicators for Problematic Hydric Soils³ <input type="checkbox"/> 2 cm Muck (A10)(MLRA 147) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136,147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.								
Restrictive Layer (if observed): Type: None Depth (in):					Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Remarks: Soil marginal for wetland, but with problem soils, strong hydrology and wetland vegetation present, the soils are assumed wetland also.								

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)			<u>Secondary Indicators (minimum of two required)</u>		
<input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input checked="" type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)			
Field Observations: Surface Water Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): Water Table Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): Saturation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): (includes capillary fringe)			Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					
Remarks:					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont (DRAFT)

Project/Site: P Ridge Processing - Wetland D		City/County: Daviess/Ohio	Sampling Date: 1/23/13
Applicant/Owner: West KY Minerals		State: Kentucky	Sampling Point: WP 1905
Investigator(s): Laura Heil & Peggy Measel		Section, Township, Range:	
Landform (hillslope, terrace, etc.): terrace seep		Local Relief: <input type="checkbox"/> concave <input type="checkbox"/> convex <input checked="" type="checkbox"/> none	
Slope: < 1%	Lat: 37° 34' 54.3"	Long: 87° 00' 15.8"	Datum:
Soil Map Unit: Waverly silt loam		Cowardin Classification: PSS1E	
Are climatic/hydrologic conditions on the site typical for this time of year? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (if no, explain in Remarks.)			
Are Vegetation, Soil, or Hydrology significantly disturbed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Are "Normal Circumstances" present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Are Vegetation, Soil, or Hydrology naturally problematic? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		(If needed, explain in Remarks.)	

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the Sampled Area within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Remarks:	

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																												
1. <i>Acer rubrum</i> (red maple)	20	Yes	FAC	Number of Dominant Species that are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across all Strata: <u>5</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100</u> (A/B)																												
2. <i>Betula nigra</i> (river birch)	15	Yes	FACW																													
3. <i>Quercus palustris</i> (pin oak)	10	Yes	FACW																													
4.																																
5.																																
Sapling/Shrub Stratum (Plot Size: 15')				Prevalence Index worksheet: <table style="width: 100%; border: none;"> <tr> <td align="center" colspan="2"><u>Total % Cover of:</u></td> <td align="center" colspan="2"><u>Multiply by:</u></td> </tr> <tr> <td>OBL Species:</td> <td align="center">0</td> <td>X 1 =</td> <td align="center">0</td> </tr> <tr> <td>FACW Species:</td> <td align="center">4</td> <td>X 2 =</td> <td align="center">8</td> </tr> <tr> <td>FAC Species:</td> <td align="center">5</td> <td>X 3 =</td> <td align="center">15</td> </tr> <tr> <td>FACU Species:</td> <td align="center">0</td> <td>X 4 =</td> <td align="center">0</td> </tr> <tr> <td>UPL Species:</td> <td align="center">0</td> <td>X 5 =</td> <td align="center">0</td> </tr> <tr> <td>Column Totals: (A)</td> <td align="center"><u>9</u></td> <td></td> <td align="center"><u>23(B)</u></td> </tr> </table> Prevalence Index = B/A = <u>23/9=2.6</u>	<u>Total % Cover of:</u>		<u>Multiply by:</u>		OBL Species:	0	X 1 =	0	FACW Species:	4	X 2 =	8	FAC Species:	5	X 3 =	15	FACU Species:	0	X 4 =	0	UPL Species:	0	X 5 =	0	Column Totals: (A)	<u>9</u>		<u>23(B)</u>
<u>Total % Cover of:</u>		<u>Multiply by:</u>																														
OBL Species:	0	X 1 =	0																													
FACW Species:	4	X 2 =	8																													
FAC Species:	5	X 3 =	15																													
FACU Species:	0	X 4 =	0																													
UPL Species:	0	X 5 =	0																													
Column Totals: (A)	<u>9</u>		<u>23(B)</u>																													
1. <i>Acer rubrum</i> (red maple)	20	Yes	FAC																													
2. <i>Salix nigra</i> (black willow)	10	Yes	FACW																													
3.																																
4.																																
5.																																
Herbaceous Stratum (Plot Size: 5')				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide Supporting Data) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be																												
1. <i>Solidago rugosa</i> (goldenrod)	5	Yes	FACW																													
2. <i>Lonicera japonica</i> (honeysuckle)	7	Yes	FAC																													
3. <i>Eupatorium serotinum</i> (thoroughwort)	3	Yes	FAC																													
4.																																
5.																																
6.																																
7.																																
8.																																
Woody Vine (Plot Size: -)				Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																												
1. <i>Lonicera japonica</i> (honeysuckle)	5	Yes	FAC																													
2.																																
Remarks:																																

Profile Description (Describe to the depth needed to document the indicator of confirm the absence of indicators.)											
Depth (in)	Matrix		Redox Features				Texture	Remarks			
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²					
1-4	10YR 4/1	60	10YR 5/8	40	C	M	SiClLo				
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix											
Hydric Soil Indicators: <table border="0" style="width:100%"> <tr> <td style="width:33%"> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2cm Muck (A10) (LRR N, MLRA 147,148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) </td> <td style="width:33%"> <input type="checkbox"/> Polyvalue Below Surface (S8)(MLRA 147,148) <input type="checkbox"/> Thin Dark Surface (S9)(MLRA 147,148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input checked="" type="checkbox"/> Fe-Mn Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13)(LRR N, MLRA 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148) </td> <td style="width:33%"> Indicators for Problematic Hydric Soils³ <input type="checkbox"/> 2 cm Muck (A10)(MLRA 147) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136,147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) </td> </tr> </table>									<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2cm Muck (A10) (LRR N, MLRA 147,148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> Polyvalue Below Surface (S8)(MLRA 147,148) <input type="checkbox"/> Thin Dark Surface (S9)(MLRA 147,148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input checked="" type="checkbox"/> Fe-Mn Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13)(LRR N, MLRA 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148)	Indicators for Problematic Hydric Soils³ <input type="checkbox"/> 2 cm Muck (A10)(MLRA 147) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136,147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2cm Muck (A10) (LRR N, MLRA 147,148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> Polyvalue Below Surface (S8)(MLRA 147,148) <input type="checkbox"/> Thin Dark Surface (S9)(MLRA 147,148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input checked="" type="checkbox"/> Fe-Mn Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13)(LRR N, MLRA 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148)	Indicators for Problematic Hydric Soils³ <input type="checkbox"/> 2 cm Muck (A10)(MLRA 147) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136,147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)									
Restrictive Layer (if observed): Type: None Depth (in):				Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							
Remarks:											

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)		<u>Secondary Indicators (minimum of two required)</u>
<input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): Water Table Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): Saturation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): (includes capillary fringe)		Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: Beaver activity present; tree stratum sparse		

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont (DRAFT)

Project/Site: P Ridge Processing - Wetland E		City/County: Daviess/Ohio	Sampling Date: 1/23/13
Applicant/Owner: West KY Minerals		State: Kentucky	Sampling Point: WP 1914
Investigator(s): Laura Heil & Peggy Measel		Section, Township, Range:	
Landform (hillslope, terrace, etc.):		Local Relief: <input checked="" type="checkbox"/> concave <input type="checkbox"/> convex <input checked="" type="checkbox"/> none	
Slope: < 2%	Lat: 37° 34' 50.1"	Long: 87° 00' 15.0"	Datum:
Soil Map Unit:		Cowardin Classification: PEM1C	
Are climatic/hydrologic conditions on the site typical for this time of year? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (if no, explain in Remarks.)			
Are Vegetation, Soil, or Hydrology significantly disturbed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Are "Normal Circumstances" present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Are Vegetation, Soil, or Hydrology naturally problematic? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		(If needed, explain in Remarks.)	

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is the Sampled Area within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks:	

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across all Strata: <u>3</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>66</u> (A/B)
1. <i>Liquidambar styraciflua</i> (sweetgum)	1	Yes	FACW	
2.				
3.				
4.				
Sapling/Shrub Stratum (Plot Size:)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL Species: _____ X 1 = _____ FACW Species: _____ X 2 = _____ FAC Species: _____ X 3 = _____ FACU Species: _____ X 4 = _____ UPL Species: _____ X 5 = _____ Column Totals: (A) _____ (B) _____ Prevalence Index = B/A = _____
1.				
2.				
3.				
4.				
Herbaceous Stratum (Plot Size: 5')				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide Supporting Data) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) <small>¹Indicators of hydric soil and wetland hydrology must be</small>
1. <i>Festuca sp</i> (fescue)	64	Yes	NI	
2. <i>Typha latifolia</i> (Cattail)	35	Yes	OBL	
3.				
4.				
5.				
6.				
7.				
Woody Vine (Plot Size: -)				Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1.				
2.				
Remarks: Mowed to edge of ponded area, plants only identified in pond.				

Profile Description (Describe to the depth needed to document the indicator of confirm the absence of indicators.)								
Depth (in)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
1-4	10YR 4/1	80	10YR 4/8	20	C	M	SiClLo	
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix								
Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2cm Muck (A10) (LRR N, MLRA 147,148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Polyvalue Below Surface (S8)(MLRA 147,148) <input type="checkbox"/> Thin Dark Surface (S9)(MLRA 147,148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Fe-Mn Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13)(LRR N, MLRA 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148)								
Indicators for Problematic Hydric Soils³ <input type="checkbox"/> 2 cm Muck (A10)(MLRA 147) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136,147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.								
Restrictive Layer (if observed): Type: None Depth (in):					Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)			<u>Secondary Indicators (minimum of two required)</u>		
<input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)			
Field Observations: Surface Water Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): Water Table Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): Saturation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): (includes capillary fringe)			Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					
Remarks: Small ponded area in pasture.					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont (DRAFT)

Project/Site: P Ridge Processing - Wetland F		City/County: Daviess/Ohio	Sampling Date: 2/25/13
Applicant/Owner: West KY Minerals		State: Kentucky	Sampling Point: WP 397
Investigator(s): Bill Sampson, John Bottom		Section, Township, Range:	
Landform (hillslope, terrace, etc.): Bottom		Local Relief: <input type="checkbox"/> concave <input type="checkbox"/> convex <input checked="" type="checkbox"/> none	
Slope: < 2%	Lat: 37° 34' 58.7"	Long: 87° 00' 19.1"	Datum:
Soil Map Unit: Waverly silt loam		Cowardin Classification: PFO1A	
Are climatic/hydrologic conditions on the site typical for this time of year? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (if no, explain in Remarks.)			
Are Vegetation, Soil, or Hydrology significantly disturbed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Are "Normal Circumstances" present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Are Vegetation, Soil, or Hydrology naturally problematic? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		(If needed, explain in Remarks.)	

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soil Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<p align="center">Is the Sampled Area within a Wetland?</p> <p align="center"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
Remarks: Area recently logged. Beavers have cut down several of the smaller trees.	

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 30')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <i>Betula nigra</i> (river birch)	10	Yes	FACW	Number of Dominant Species that are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across all Strata: <u>7</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>83</u> (A/B)
2. <i>Acer rubrum</i> (red maple)	5	No	FAC	
3. <i>Platanus occidentalis</i> (sycamore)	25	Yes	FACW	
4.				
5.				
Sapling/Shrub Stratum (Plot Size: 15')				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL Species: _____ X 1 = _____ FACW Species: _____ X 2 = _____ FAC Species: _____ X 3 = _____ FACU Species: _____ X 4 = _____ UPL Species: _____ X 5 = _____ Column Totals: (A) _____ (B) _____ Prevalence Index = B/A = _____
1. <i>B. nigra</i> (river birch)	10	Yes	FACW	
2. <i>A. rubrum</i> (red maple)	15	Yes	FAC	
3. <i>Salix nigra</i> (black willow)	15	Yes	OBL	
4.				
Herbaceous Stratum (Plot Size: 5')				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide Supporting Data) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be
1. <i>Allium tricoccum</i> (wild onion)	15-20	Yes	FACU	
2. <i>Carex sp.</i> (sedge)	2	No	FACW+	
3. <i>Panicum cladinum</i> (deertongue)	2	No	-	
4. Unknown broad leaf herb	3	No	-	
5.				
6.				
7.				
Woody Vine (Plot Size: -)				
1.				<p>Hydrophytic Vegetation Present?</p> <p align="center"><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
2.				
Remarks:				

Profile Description (Describe to the depth needed to document the indicator of confirm the absence of indicators.)								
Depth (in)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5"							SICLLO	Light brown
5-8"	10YR 5/4	70	10YR 5/6				SICLLO	
8+"							SICLLO	Brown
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix								
Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2cm Muck (A10) (LRR N, MLRA 147,148) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Polyvalue Below Surface (S8)(MLRA 147,148) <input type="checkbox"/> Thin Dark Surface (S9)(MLRA 147,148) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Fe-Mn Masses (F12)(LRR N, MLRA 136) <input type="checkbox"/> Umbric Surface (F13)(LRR N, MLRA 136) <input type="checkbox"/> Piedmont Floodplain Soils (F19)(MLRA 148)								
Indicators for Problematic Hydric Soils³ <input type="checkbox"/> 2 cm Muck (A10)(MLRA 147) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136,147) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.								
Restrictive Layer (if observed): Type: None Depth (in):				Hydric Soil Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Remarks: Soils borderline								

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply)		<u>Secondary Indicators (minimum of two required)</u>	
<input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input checked="" type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth (in): Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth (in): Saturation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth (in): (includes capillary fringe)		Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: Small depression near NW corner of large pond.			

Wetland A



Wetland B



Wetland C1



Wetland C2



Wetland D

Wetland E



Wetland F

