## LARGE FILING SEPERATOR SHEET

CASE NUMBER: 06-1358-EL-BGN

FILE DATE: 5-4-07

SECTION: 4 45

NUMBER OF PAGES: 200

American Municipal Power

ChigEPA Primary Headwater Habitat Evaluation Form
SITE NAMELOCATION AMP-Ohio
SHE NAME/LOCATION APAP OT UP SHE NUMBER B M SSIB RIVER BASIN DRAINAGE AREA (mi <sup>2</sup> )
DATE 12-1-0'5 SCORER BEM COMMENTS
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL DIRECOVERED DRECOVERING DRECENT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.
Image: BEDROCK [16 pt]         Image: BEDROCK [16 pt]<
Total of Percentages of (A) (B) (A + B
Bidr Slabs, Bouider, Cobble, Bedrock 70 /0 2/
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES:
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of Pool Depth
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): Max = 30
□ > 22.5 - 30 cm [30 pts]
COMMENTS MAXIMUM POOL DEPTH (centimeters):
3.       BANK FULL WIDTH (Measured as the average of 3-4 measurements)       (Check ONLY one box):       Bankfull         > 4.0 meters (≥ 13) [30 pts]       > 1.0 m - 1.5 m (≥ 3' 3" + 4'87) [15 pts]       Width         > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]       > 1.0 m (≤ 3' 3") [5 pts]       Max=30,
>1.5 m - 3.0 m (-2 9' 7* 4' 8') [20 pts]
This information must also be completed
RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆ <u>RIPARIAN WIDTH</u> <u>FLOODPLAIN QUALITY</u>
L/R/ (Per Bank) L R (Most Predominant per Bank) L R
Image: Image State
Nerrow <5m OC Residential, Park, New Field Oc Crop
None     I I Fenced Pasture     I I Mining or Construction
COMMENTS
FLOW REGIME (At Time of Evaluation)       (Check ONLY one box):         Stream Flowing       Moist Channel, isolated pools, no flow (Intermittent)         Subsurface flow with isolated pools (Interstitial)       Dry channel, no water (Ephemeral)         COMMENTS
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):
🛄 None 📃 1.0 🛄 2.0 🖾 3.0
STREAM GRADIENT ESTIMATE Flat (0.5 N/100 ft) Flat to Moderate (2 N/100 ft) Moderate (2 N/100 ft) Severe (10 N/100 ft)

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ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):	BM-S13
QHEI PERFORMED? - 🗇 Yes 💢 No QHEI Score (if Yes, Attach Completed QHE	El Form)
DOWNSTREAM DESIGNATED USE(S)	
Distance from E	
CWH Name: Distance from E     Distance from E     Distance from E	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY I ISGS Quadrangle Name: <u>News Haven, WV-OH</u> NRCS Soil Map Page: NRC	
county: Melgs Churty Township/City: Letart Fall	
MISCELLANEOUS	<u>, or would</u>
ase Flow Conditions? (Y/N): Date of last precipitation:Q9-05 Quantity:	iknown
hotograph Information: <u>Y-Photo #78 - Concord Camera</u>	
levated Turbidity? (Y/N): <u>N</u> Canopy (% open): <u>30</u> 7 <u>p</u>	
Vere samples collected for water chemistry? (Y/N): W (Note lab sample no. or id. and attach results) I	Lab Number:
ield Measures: Temp ("C) Dissolved Oxygen (mg/l) pH (S.U.) Conductiv	ity (µmhos/cm)
a the sampling reach representative of the stream (Y/N)	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOTE: all vouche ID number. Include appropriate field data sheets from the Primary Headwater Ha	•
Comments Regarding Biology:	
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	· · · · · · · · · · · · · · · · · · ·
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This I	
Include important landmarks and other features of interest for site evaluation and a narrative des	cription of the stream's location
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PHWH Form Page - 2

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ENGTH OF		<u>nio</u>	
		$BM-S14$ river basin drainage area (m <sup>2</sup> ) $\leq 1$	M
ATE 2-		LAT LONG RIVER CODE RIVER MILE	
	•	COMMENTS drains into Stream BM S-13	
		rm - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruc	
		ATURAL CHANNEL D RECOVERED RECOVERING RECENT OR NO RECOV	/ERY
MODIFIC	ATIONS5		
		very type of substrate present. Check ONLY two predominant substrate TYPE boxes	н
		FENGENI IFE FENGENI	Me
	BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts]		Poi
00	BEDROCK [16 pt]		Suba Max
	COBBLE (65-256 mm) [12 pts] GRAVEL (2-64 mm) [9 pts])	$\frac{10}{\sqrt{35}} \circ \Box \Box  \text{clay of HARDPAN [0 pt]}$	
	SAND (<2 mm) [8 pts]		þd(
•	Total of Percentages of		A I
	dr Slabs, Boulder, Cobble, Bedrock <u>(</u> TWO MOST PREDOMINATE SUB	$\frac{2}{5}$	~
		maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of a fload culverts or storm water pipes) (Check ONLY one box):	Pool Max
🔲 > 3	0 centimeters [20 pts] 2.5 30 cm [30 pts]	>20 >5 cm - 10 cm [15 pts] 0 < δ cm [6 pts]	
	0 • 22.5 cm [25 pts]		15
CC	OMMENTS	MAXIMUM POOL DEPTH (centimeters):	
3. B/	ANK FULL WIDTH (Measured as th	he average of 3-4 measurements) (Check ONLY one box):	Bar
>#	.0 meters (> 13') [30 pts] .0 m - 4.0 m (> 9' 7"- 13') [25 pts]	□ > 1.0 m = 1.5 m (> 3' 3' - 4' 8') [15 pto] □ ≤ 1.0 m (≤ 3' 3'') [5 pto]	Wi Ma
	.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		
, C(	OMMENTS	AVERAGE BANKFULL WIDTH (meters)	d
	·····		
		This information must also be completed	
	<b>RIPARIAN ZONE AND FLOO</b>	DPLAIN QUALITY ORNOTE: River Left (L) and Right (R) as looking downstream or	
	RIPARIAN ZONE AND FLOOR RIPARIAN WIDTH	FLOODPLAIN QUALITY	
L C	<u>RIPARIAN WIDTH</u> ./R / (Per Bank)	FLOODPLAIN QUALITY         L R         (Most Predominant per Bank)         L R         Mature Forest, Wetland         Mature Forest, Shrub or Old         Mature Forest, Shrub or Old	
	RIPARIAN WIDTH /R/ (Per Bank) J J Wide >10m	FLOODPLAIN QUALITY         L R         Mature Forest, Wetland         Mature Forest, Wetland         Mature Forest, Shrub or Old         Mature Forest, Shrub or Old         Field         Mature Forest, Shrub or Old         Mature Forest, Shrub or Old	
	RIPARIAN WIDTH           /R / (Per Bank)           I J Wide >10m           J J Moderate 5-10m           J J Narrow <5m	FLOODPLAIN QUALITY         L R         (Most Predominant per Bank)         L R         Mature Forest, Wetland         Mature Forest, Shrub or Old         Field         Oner Pasture, Row	
	RIPARIAN WIDTH (Per Bank) Wide >10m Moderate 5-10m Narrow <5m	FLOODPLAIN QUALITY         L R         (Most Predominant per Bank)         Mature Forest, Wetland         Mature Forest, Wetland         Mature Forest, Shrub or Old         Field         Residential, Park, New Field         Open Pasture, Row Crop	
	RIPARIAN WIDTH (Per Bank) Wide >10m Moderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time of E	FLOODPLAIN QUALITY         L R       (Most Predominant per Bank)         Mature Forest, Wetland         Mature Forest, Wetland         Mature Forest, Shrub or Old         Mature Forest, Shrub or Old         Residential, Park, New Field         Penced Pasture         Hining or Construction	
	RIPARIAN WIDTH (Per Bank) Wide >10m Moderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time of E Stream Flowing Subsurface flow with isolated p	FLOODPLAIN QUALITY         L R       (Most Predominant per Bank)         Mature Forest, Wetland         Mature Forest, Wetland         Mature Forest, Shrub or Old         Immature Forest, Shrub or Old         Field         Residential, Park, New Field         Fenced Pasture         Fenced Pasture         Mining or Construction	
	RIPARIAN WIDTH (Per Bank) Wide >10m Moderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time of E Stream Flowing	FLOODPLAIN QUALITY         L R       (Most Predominant per Bank)         Mature Forest, Wetland         Mature Forest, Wetland         Mature Forest, Shrub or Old         Immature Forest, Shrub or Old         Field         Residential, Park, New Field         Fenced Pasture         Fenced Pasture         Mining or Construction	

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	e from Evaluated Stream a from Evaluated Stream b from Evaluated Stream EARLY MARK THE SITE LOCATION NRCS Soil Map Stream Order F.M. Ohio and http://www.
WH Name:       Distance         WH Name:       Distance         WH Name:       Distance         Distance       Distance         SQuadrangle Name:       Musc Koren, WY - OH         NRSCELLANEOUS       Township / City:         e Flow Conditions? (V/N):       Dete of last precipitation:       [1-29-05]         Information:       Y- PhUtb #79 - Concord Carro (ca       material transmission:         rated Turbkitty? (Y/N):       Canopy (% open):       30 72         re samples collected for water chemistry? (Y/N):       (Note lab sample no. or id. and attach         d Messures:       Temp (*C)       Dissolved Dxygen (mg/i)       pH (S.U.)         itional commenta/description of pollution impacts:       If not, please explain:       itional commental/description of pollution impacts:         Bitional commenta/description of pollution impacts:       It not, please stress from the Primary Hee         h Observed? (Y/N)       Voucher? (YN)       Aquistic Macroinvertebrake Observed? (YN)       Voucher? (YN)         go Tadpoles Observed? (YM)	e from Evaluated Stream from Evaluated Stream EARLY MARK THE SITE LOCATION NRCS Soil Map Stream Order FallsOhioareq filly:
WH Name:	tity:
WH Name:	EARLY MARK THE SITE LOCATIONNRCS Soil Map Stream Order Falls, Ohio areq tity:
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. C         SS Quadrangie Name: <u>Musc Marcin, LW - 0H</u> NRCS Soil Map Page:	EARLY MARK THE SITE LOCATION NRCS Soil Map Stream Order Falls, Ohio areg tity:
the sampling reach representative of the stream (Y/N) ↓ If not, please explain: itional comments/description of pollution impacts: BIOTIC EVALUATION formed? (Y/N): // (If Yes, Record all observations. Voucher collections optional. NOTE: ID number. Include appropriate field data sheets from the Primary Hea h Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed mments Regarding Biology:	results) Lab Number:
BIOTIC EVALUATION         formed? (Y/N): M       (if Yes, Record all observations. Voucher collections optional. NOTE: ID number. Include appropriate field data sheets from the Primary Heath Dobserved? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? mments Regarding Biology:	
Include important landmarks and other features of interest for site evaluation and a name Steep Slope ow BFW:	II voucher samples must be labeled with the site Iwater Habitat Assessment Manual) her? (Y/N)
BFW=5' Steep Stope	· · ·
	41 BWS
ober 24, 2002 Revision PHWH Form Page - 2	41 BWS
	41 3119 135 3119 234

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Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :	23
SITE NAME ADCATION AMP-ONIO	
SITE NUMBER BIM-SLS RIVER BASINDRAINAGE AREA (mi <sup>2</sup> )	
LENGTH OF STREAM REACH (R) 100 LAT. LONG. RIVER CODE RIVER MILE	
DATE 12/1/05 SCORER KOOSEY COMMENTS	
STREAM CHANNEL ON NONE / NATURAL CHANNEL OR RECOVERED RECOVERING RECENT OR NO R MODIFICATIONS:	COVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxet (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHE
TYPE PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts]         Image: Silt [3 pt]         Image:	Points
BEDROCK [16 pt]         D         FINE DETRITUS [3 pts]           D         COBBLE (65-256 mm) [12 pts]         D         CLAY or HARDPAN [0 pt]	Substrate Max = 40
GRAVEL (2-64 mm) [9 pts]	10
Image: SAND (<2 mm) [6 pts]	10.
Total of Percentages of (A) (B) (B) (B) (B) (B) (B) (B) (B) (B) (B	A+B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:	J
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box)	Pool Dapth
□ > 30 centimeters (20 pts) □ > 5 cm - 10 cm [15 pts]	Max = 30
□         > 22.5 · 30 cm [30 pts]           □         > 10 · 22.5 cm [25 pts]           □         > 10 · 22.5 cm [25 pts]	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (> 13') [30 pts] [15 pts]	Bankfuli Width
⇒ 3.0 m - 4.0 m (> 9' 7" - 13) [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] ✓ ≤ 1.0 m (≤ 3' 3") [5 pts]	Max=30
COMMENTSAVERAGE BANKFULL WIDTH (motors)	15
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ট NOTE: River Left (L) and Righl (R) as looking downstream의	
RIPARIAN WIDTH FLOODPLAIN QUALITY	
LR (Per Bank) LR (Most <u>Predo</u> minant per Bank) LR VI Wide >10m VI <u>Mature Earest</u> , Wetland II Conservation Tillag	•
Moderate 5-10m O Immature Forest, Shrub or Old O O Urban or Industrial	
Narrow <5m Crop Open Pasture, Rov Crop	
O None O Fenced Pasture O Mining or Construct	ion
FLOW REGIME (At Time of Evaluation)       (Check ONLY one box);         Stream Flowing       Moist Channel, isolated pools, no flow (Interstitial)         Subsurface flow with isolated pools (Interstitial)       Dry channel, no water (Ephemeral)	ent)
Subsurface flow with isolated pools (Interstitial) COMMENTS COMMENTS	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box)	
Image: Constraint of the state of	
🗇 Flat (0.5 M 100 M) 💭 Flat to Moderate 🧭 Moderate (2 M 100 M) 🗍 Moderate to Severe 🗍 Severe (1	

CHE PERFORMED? - D vs. D No. CHE Some (I Yes, Alach Completed OHEL Form)         DOVINSTREAM DESIGNATED USE(S)         WWH Name:	DDITIONAL STREAM	INFORMATION (This information Must Also b	ie Comeleteci):	BM-SIS
IVMAN Hame:	QHEI PERFO	RMED7 - D Yes D No QHEI Score	(If Yes, Attach Completed QHEI (	<sup>2</sup> orm)
CMM Name:       Distance from Evaluated Stream         EVM Name:       Distance from Evaluated Stream         MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         SGS Quadrangle Name:       Name:         MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         SGS Quadrangle Name:       Name:         MASCELLANEOUS       Township / City.         MASCELLANEOUS       Date of last precipitation:         INFORMATION:       TERD         Outpace       Outpace         MASCELLANEOUS       Canopy (% open):         SEE Flow Conditions? (VA):       Date of last precipitation:         INFORMATION:       Terms (C)         Dissolved Turbistly? (VA):       N         (Note lab sample no. or kl. and attach results) Lab Number:	DOWNSTRE/	M DESIGNATED USE(S)	· .	
EWH Name:       Distance from Evaluated Stream         MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTINE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         SGS Quadrangle Name:       Num:         Mapping:       Num:         Mapping:       NECE Soil Map Stream Order         punty:				
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         SGS Quadrangle Name: //wr/ Harren, /				
SGS Quadrangle Name: <u>Num Hancens</u> , <u>WV-OM</u> NRCS Soil Map Page NRCS Soil Map Stream Order MBSCELLANEOUS are Flow Conditions? (YM) Date of last precipitation: <u>1)/21/05</u> Quantity: <u>untroom</u> motograph information: <u>TFBO</u> evaled Turbidity? (YM): <u>N</u> Canopy (% open). <u>SO</u> tree samples collected for water chemistry? (YM): <u>N</u> (Note lab sample no. or ld. and attach results) Lab Number: ald Measures: Temp (*C) Dissolved Oxygen (mg/) PH (SU) Conductivity (µmhos/cm) the sampling reach representative of the stream (YM) <u>Y</u> If not, please explain diditional comments/description of pollution impacts <b>BIOTIC EVALUATION</b> art Dumber. Include appropriate feed data sheets from the Primary Heedweter Habital Assessment Manual) and Observed? (YM) Voucher? (YM) Salamanders Observed? (YM) voucher? (YM) voucher? (YM) orga of Tadpoles Observed? (YM) Voucher? (YM) Voucher? (YM) voucher? (YM) oucher? (YM) voucher? (YM) orga of Tadpoles Observed? (YM) voucher? (YM)	EWH Name:		Listance from Eva	usloo Siream
Sunty:				
INSCELLANEOUS       V         see Flow Conditions? (YN):	SGS Quadrangle Nam	: New Harren, WV-04 1	NRCS Soil Map Page: NRCS	Soil Map Stream Order
INSCELLANEOUS       V         see Flow Conditions? (YN):	ounty: Mer	9A County Townshi	ip/city: Letart Falls	, Ohio area
notograph Information:       IFBO         evaded Turbidity? (YRI):		¥		•
notograph Information:       IFBO         evaded Turbidity? (YRI):	ase Slow Conditions?		21/05 QUARTING LUN	hanam
evaled Turbidity? (YAN):				
tere samples collected for water chemistry? (Y/N): N   (Note lab sample no. or kl. and attach results) Lab Number: ald Measures: Temp (*C) Dissolved Oxygen (mg/n) pH (S.U.) Conductivity (µmhos/cm) the sampling reach representative of the stream (Y/N), If not, please explain: dditional comments/description of pollution impacts: BIOTS: EVALUATION erformed? (Y/N): N (if Yes, Record all observations: Voucher: collections optional: NOTE: all voucher samples must be jabeled with the reprint of the stream of the stream's location DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location S - 14 S - 15				·····
eld Measures:       Temp (*C)		\	—	
the sampling reach representative of the stream (Y/N) If not, please explain	Vere samples collected	for water chemistry? (Y/N): <u>N</u> (Note lab s	ample no. or id. and attach results) La	b Number:
dditional comments/description of pollution impacts:         BIOTIC EVALUATION         enformed? (Y/N):       N         (I) Yes, Record all observations. Voucher collections optional NOTE: all voucher samples must be labeled with the sitil number. Include appropriate field data sheets from the Primary Headwater Habital Assessment Manual)         sch Observed? (Y/N):       Voucher? (Y/N):         Salamanders Observed? (Y/N):       Voucher? (Y/N):         orgs or Tadpoles Observed? (Y/N):       Voucher? (Y/N):         omments Regarding Biology:       Voucher? (Y/N):         ORAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):         Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location         S-14       Tadpoles         Y=LOW       Tadpoles	ield Measures: Ter	ip ("C) Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity	(µmhos/cm)
BIOTIC EVALUATION         erformed? (Y/N):	s the sampling reach re	presentative of the stream (Y/N) If not, pl	lease explain:	
BIOTIC EVALUATION         erformed? (Y/N):				
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location 5-14 The stream's location 5-14 5-14 5-15	enformed? (Y/N): ish Observed? (Y/N) rogs or Tadpoles Obse	(Il Yes, Record all observations. Voucher o ID number. Include appropriate field data s Voucher? (Y/N) Salamanders Observed? (Y/N) Aquatic	sheets from the Primary Headwater Habi served? (Y/N) Voucher? (Y/N)_ : Macroinvertebrates Observed? (Y/N)_	tal Assessment Manual)
Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location S-14 The stream's location S-14 S-14 S-14 S-15				
Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location S-14 The stream's location S-14 S-14 S-14 S-15	· <u> </u>			
Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location S-14 The stream's location S-14 S-14 S-14 S-15				
LOW A S-14			·	— · ·
LOW -> S-14. Stime limbe over H A S-15 limb	lucione imborta	it landmarks and other reacties of interest for		priori or the stream's tocation
LOW A S-15 limbe				۰. ۲
LOW -> Contract over			and the second sec	2-14
H A S-15 limb	_	stump	····	
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October 24, 2002 Revision

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## ChieEPA Primary Headwater Habitat Evaluation Form (Loss I HHEI Score (sum of metrics 1, 2, 3): 40

SITE NAME/LOCATION AMP-Ohio			ii.
StreamSITE NUMBER_BM	-SIG RIVER BASIN	DRAINAGE AREA (mi²) 4/mi	2
LENGTH OF STREAM REACH (R) 200 LA	NT LONG RIM	ER CODE RIVER MILE	
DATE 12-1-05 SCORER BEM	COMMENTS drains into :	Stream Bm: 5-13	
NOTE: Complete All Items On This Form -			
STREAM CHANNEL IN NONE / NATURE MODIFICATIONS		OVERING I RECENT OR NO RECOVERY	Y
(Max of 32). Add total number of significant	type of substrate present. Check ONLY two substrate types found (Max of 8). Final metric CENT TYPE SILT [3 pt] CENT LEAF PACK/WOODY CEAT FINE DETRITUS [3 CLAY or HARDPAN	been is sum of boxes A & B. PERCENT DEBRIS [3 pts] pts]	HEI etric oints ostrate x = 40
GRAVEL (2-64 mm) (9 pts) Z		—— II.a	0
Total of Percentages of Bidr Slabs, Boulder, Cobbie, Bedrock	~ ~ [15]		+ B
evaluation. Avoid plunge pools from road o		one box): Max	1 Depth x = 30
3. BANK FULL WIDTH (Measured as the av 4.0 meters (> 137] [30 pts] 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] 3.1.5 m - 3.0 m (> 9' 7" - 4' 6") [20 pts] COMMENTS	🔲 > 1.0 m = 1.5 m (> 3'	3" - 4" 6") [16 pte] [ ] ]	nkfuli fidth 1x=30
RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH	This information <u>must</u> also be complete AIN QUALITY \$NOTE: River Left (L) and <u>FLOODPLAIN QUALITY</u>	ed Right (R) as looking downstream 🕯	
L R (Per Bank) I W Wide >10m	L R (Most Predominant per Bank)	L R	
Moderate 5-10m	Immature Forest, Shrub or Old	Urban or Industrial	
🗍 🗍 Narrow <5m	Field Field Residential, Park, New Field	Open Pasture, Row	
		Crap Mining or Construction	
FLOW REGIME (At Time of Evaluation of Evalua	Moist Chan	nel, isolated pools, no flow (Intermittent) I, no water (Ephemeral)	
SINUOSITY (Number of bends per None 0.5	r 61 m (200 ft) of channel) (Check OWLY one 1.0	3.0	
	1.5 🗍 2.5	<b>∐</b> >3	

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed): BM-516
QHEI PERFORMED? - Ves Vo QHEI Score (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)         DWWH Name:
EWH Name: Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: New Haven, WV-OH NRCS Soil Map Page: NRCS Soil Map Stream Order
county: <u>Merge Conty</u> Township/ City: Letart Ills, Ohio area
MISCELLANEOUS Base Flow Conditions? (Y/N): <u>Y</u> Date of last precipitation: <u>11-29-05</u> Quantity: <u>unknom</u>
Photograph information: Y-Photo # 8.3 - concord camera_
Elevated Turbidity? (Y/N): N Canopy (% open): 46%
Were samples collected for water chemistry? (Y/N): (Note tab sample no. or id. and attach results) Lab Number
Field Measures: Temp (*C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) / If not, please explain:
Additional comments/description of pollution impacts:
BIOTIC EVALUATION
Performed? (Y/N): (If Yes, Record all observations, Voucher collections optional, NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):
include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location
1/201 Streem
FLOW A DE DE BENEROVI BENEROVI BENEROVI BENEROVI BENEROVI BENEROVI BENEROVI BENEROVI
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## **ChieEPA** Primary Headwater Habitat Evaluation Form (Lass HHEI Score (sum of metrics 1, 2, 3):

	BM-ST PRIVER BASIN	DRAINAGE AREA (mi?) 4/mi2
LENGTH OF STREAM REACH (ft)	LATLONG RIVER C	
	1 comments drama into 5	
NOTE: Complete All Items On This Fo	rm - Refer to "Field Evaluation Manual for Ohio	's PHWH Streams" for Instructions
STREAM CHANNEL NONE / N MODIFICATIONS		
• •	very type of substrate present. Check ONLY two predo ficant substrate types found (Max of 8). Final metric scon	
TYPE	PERCENT TYPE	PERCENT Metric Points
BOULDER (>256 mm) [16 pts],		
BEDROCK [16 pt]     COBBLE (65-256 mm) [12 pts]		
COBBLE (65-256 mm) [12 pts]	$\frac{2}{\sqrt{-80}}$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$ $3$	
SAND (<2 mm) (6 pts)		
Total of Percentages of	30.9 (A)	(B) A+B
Bidr Siabs, Boukier, Cobble, Bedrock		
2. Maximum Pool Depth (Measure the	maximum pool depth within the 61 meter (200 ft) eval	luation reach at the time of Pool Depth
evaluation. Avoid plunge pools from re	pad culverts or storm water pipes) (Check ONLY one b	ox): Max = 30
30 centimeters [29 pts] > 22:5 - 30 cm [30 pts]	>5 cm - 10 cm [15 pts] < < 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts]	NO WATER OR MOIST	CHANNEL [0 pts]
COMMENTS	MAXIMUM POOL	DEPTH (centimeters):
3. BANK FULL WIDTH (Measured as th	the average of 3-4 measurements) (Check ON	(LY one hox): Sankfuß
3. BANK FULL WIDTH (Measured as the second s	na se esta de la companya de la comp	
	⊠ > 1.0 m → 1.5 m (> 3' 3" → 4 □ ≤ 1.0 m (< 3' 3")[8 ptm]	B") [15 pts] Width
<ul> <li>&gt;4.0 meters (&gt; 13') [30 pts]</li> <li>&gt; 3.0 m -4.0 m (&gt; 9' 7" - 13') [25 pts]</li> <li>&gt; 1.5 m - 3.0 m (&gt; 9' 7" - 4' 8") [20 pts]</li> </ul>	⊠ > 1.0 m - 1.5 m (≥ 3'3" - 4 □ ≤ 1.0 m (≤ 3'3") [5 pts]	Width Max=30 3.7.1
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 8' 7" - 13') [25 pts]	⊠ > 1.0 m - 1.5 m (≥ 3'3" - 4 □ ≤ 1.0 m (≤ 3'3") [5 pts]	B") [15 pts] Width
<ul> <li>&gt;4.0 meters (&gt; 13') [30 pts]</li> <li>&gt; 3.0 m -4.0 m (&gt; 9' 7" - 13') [25 pts]</li> <li>&gt; 1.5 m - 3.0 m (&gt; 9' 7" - 4' 8") [20 pts]</li> </ul>	⊠ > 1.0 m - 1.5 m (≥ 3'3" - 4 □ ≤ 1.0 m (≤ 3'3") [5 pts]	Width Max=30 3.7.1
> 4.0 meters (> 13) [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13) [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS	AVERAGE BANKI AVERAGE BANKI This information must also be completed OPLAIN QUALITY \$\frac{1}{2}NOTE: River Left (L) and Righ	FB) [16 pts] Width Max=30 /5 FULL WIDTH (meters)
> 4.0 meters (> 13) [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13) [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS	AVERAGE BANKI AVERAGE BANKI This information must also be completed OPLAIN QUALITY \$\frac{1}{2}NOTE: River Left (L) and Righ FLOODPLAIN QUALITY L R (Most Predominant per Bank)	FB) [15 pts] Width Max=30 5 FULL WIDTH (meters) X (R) as looking downstream☆ L R
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS	This information must also be completed DPLAIN QUALITY ANOTE: River Left (L) and Righ FLOODPLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland	F8") [15 pts]       Width         Max=30       5         FULL WIDTH (meters)       5         t (R) as looking downstream \$       5         L R       Conservation Tillage
> 4.0 meters (> 13) [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13) [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS	This information must also be completed DPLAIN QUALITY ANOTE: River Left (L) and Righ FLOODPLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland	FB) [15 pts] Width Max=30 5 FULL WIDTH (meters) X (R) as looking downstream☆ L R
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS	Image: State Stat	FB) [15 pts]       Width         FULL WIDTH (meters)       71         FULL WIDTH (meters)       5         t (R) as looking downstream \$\$       5         t (R) as looking downstream \$\$       5         U R       Conservation Tillage         U Urban or Industrial       Open Pasture, Row
A.0 meters (> 13) [30 pts]          > 3.0 m       -4.0 m (> 9' 7" - 13') [25 pts]         > 1.5 m       -3.0 m (> 9' 7" - 4' 8") [20 pts]         COMMENTS	Image: State Sta	FB) [15 pte]       Width         Max=30       5         FULL WIDTH (meters)       5         t (R) as looking downstreams         t (R) as looking downstreams         L R         O Conservation Tillage         O Urban or Industrial
> 4.0 meters (> 13) [30 pts]         > 3.0 m       -4.0 m (> 9' 7" - 13) [25 pts]         > 1.5 m       -3.0 m (> 9' 7" - 4' 8") [20 pts]         COMMENTS	AVERAGE BANKI AVERAGE BANKI This information must also be completed AVERAGE BANKI DPLAIN QUALITY ANOTE: River Left (L) and Righ FLOODPLAIN QUALITY L R (Most Predominant per Bank) Mature Forest, Wetland Mature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture Evaluation) (Check ONLY one box): Moist Channel, is	K (R) as looking downstream☆ L R Conservation Tillage Urban or Industrial Open Pasture, Row Crop
> 4.0 meters (> 13) [30 pts]          > 3.0 m       -4.0 m (> 9' 7"- 13') [25 pts]         > 1.5 m       -3.0 m (> 9' 7"- 4' 8") [20 pts]         COMMENTS	> 1.0 m - 15 m (> 3' 3' - 4         > 1.0 m (< 3' 3') [5 pts]	FB) [15 pts]       Width         Max=30       5         FULL WIDTH (meters)       5         It (R) as looking downstream fr       5         L R       Conservation Tillage         Urban or Industrial       Open Pasture, Row         Crop       Mining or Construction         It (R) ools, no flow (Intermittent)       water (Ephemeral)
> 4.0 meters (> 13) [30 pts]         > 3.0 m       -4.0 m (> 9' 7"- 13) [25 pts]         > 1.5 m       -3.0 m (> 9' 7"- 4' 8") [20 pts]         COMMENTS         RIPARIAN ZONE AND FLOO RIPARIAN WIDTH         L       R       (Per Bank)         I       Yvide >10m       Image: Stream Flowing         I       None COMMENTS       None COMMENTS         FLOW REGIME (At Time of E Stream Flowing       Subsurface flow with isolated p COMMENTS         SINUOSITY (Number of bend None       None	Image: Second state sta	FB) [15 pea]       Width         Max=30       5         FULL WIDTH (meters)       5         Image: State of the stat
<ul> <li>&gt; 4.0 meters (&gt; 13) [30 pts]</li> <li>&gt; 3.0 m - 4.0 m (&gt; 9' 7" - 13) [25 pts]</li> <li>&gt; 1.5 m - 3.0 m (&gt; 9' 7" - 4' 8") [20 pts]</li> <li>COMMENTS</li></ul>	> 1.0 m - 15 m (> 3' 3' - 4         > 1.0 m (< 3' 3') [5 pts]	FB) [16 pts]       Width         Max=30       5         FULL WIDTH (meters)       5         It (R) as looking downstream from the second se

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DITIONAL STREAM INFORMATION (This information Must Also be Completed):	BM-S17
QHEI PERFORMED? - DYes No QHEI Score (If Yes, Att	tach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHE	
SGS Quadrangle Name: New Koven, UV-OH NRCS Soil Map	
sunty: <u>mer as county</u> Township / City: Let	Int Falls, Ohio area
NISCELLANEOUS	
ase Flow Conditions? (Y/N): $\underline{\checkmark}$ Date of last precipitation: $\underline{11-29-05}$	Quantity: un mon
notograph Information: photo # 82 _ concord c	ame 10
evated Turbidity? (Y/N): Canopy (% open):	
iere samples collected for water chemistry? (Y/N):/ (Note lab sample no. or id.	and attach results) Lab Number:
ield Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.)	Conductivity (µmhos/cm)
s the sampling reach representative of the stream (Y/N) If not, please explain:	
dilional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Voucher collections option ID number. Include appropriate field data sheets from the l	nal. NOTE: all voucher samples must be labeled with the site Primary Headwater Habitat Assessment Manual)
ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N)	•
rogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinverteb	rates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
	······································
DRAWING AND NARRATIVE DESCRIPTION OF STREAM	
Include important landmarks and other features of interest for site evaluation $BmS$	and a narrative description of the stream's location
Bints 11	
1.144	-Dez
FLOW	C.
NH AT	35.
	RA X
BFNtz, BFW=5.	Those .

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PHWH Form Page - 2

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Primary H	leadwater Habitat Evalua <sup>:</sup> HHEI Score (a	tion Form um of metrics 1, 2, 3) : 24
SITE NAME/LOCATION AMP - Oh iD		
SITE NUMBER B	M-SIB RIVER BASIN	DRAINAGE AREA (mi²)
LENGTH OF STREAM REACH (fl)		
DATE 12/1/05 SCORER KOOSET		
NOTE: Complete All Items On This Form	- Refer to "Field Evaluation Manual for Of	nio's PHWH Streams" for Instructions
MODIFICATIONS: Recently	exposed, was under ground	
	y type of substrate present. Check ONLY two pre- int substrate types found (Max of 8). Final metric sc	
	ERCENT TYPE	PERCENT Metric
BLDR SLABS (16 pts)	SILT (3 pt)	Points
		s) 5 Substrate
COBBLE (65-256 mm) [12 pts]	CLAY OF HARDPAN [0	pt] Max = 40
□ 22 GRAVEL (2-64 mm) [9 pts] 22 GRAVEL (2-64 mm) [9 pts]	15 00 MUCK (0 pts) 75 00 ARTIFICIAL (3 pts)	19
Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock	B (A) 15	(B) 4 A+B
SCORE OF TWO MOST PREDOMINATE SUBS	TRATE TYPES: TOTAL NUMBER	OF SUBSTRATE TYPES:
	aximum pool depth within the 61 meter (200 ft) e	
evaluation. Avoid plunge pools from road > 30 centimeters [29 pts]	culverts or storm water pipes) (Check ONLY on 5 cm - 10 cm [15 pts	
> 22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts]	5 cm [6 pts]	
3. BANK FULL WIDTH (Measured as the		ONLY one box): Bankfull
U > 4.0 meters (> 13') [30 pts] 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	□ / > 10 m → 15 m (> 3'3" □ ≤ 1.0 m (≤ 3'3")[5 pts	·· 4` 8") [15 pts] Width .] Max=30
□ > 1.5 m - 3.0 m (> 9'7" - 4'8") [20 pts]		45 5
COMMENTS	AVERAGE BAN	(KFULL WIDTH (meters)
RIPARIAN ZONE AND FLOODF	This information <u>must</u> also be completed CAIN QUALITY ☆NOTE: River Left (L) and R:	ight (R) as looking downstreamជា
RIPARIAN MDTH	FLOODPLAIN QUALITY	-
L/R/ (Per Bank) 2 0 Wide >10m	L R / (Mosl Predominant per Bank)	Conservation Tillage
Moderate 5-10m	Field	Urban or Industrial
DD Narrow <5m	Residential, Park, New Field	Open Pasture, Row
	Penced Paslure	Crop CT Mining or Construction
COMMENTS		-
FLOW REGIME (At Time of Eva		t included and an Annual termination
Subsurface flow with isolated poor COMMENTS		I, isolated pools, no flow (Intermittent) 10. water (Ephemeral)
SINUOSITY (Number of bends a	er 61 m (200 ft) of channel) (Check ONLY one bo	nx)
	1.0 D 2.0 1.5 D 2.5	
STREAM GRADIENT ESTIMATE		
Flat (0 5 w100 ft) Fial to Moderate	Moderate (2 iv 100 m D Moderate to	Severe D Severe (10 fiv100 h)

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	(if Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE V	NATERSHED AREA. CLEARLY MARK THE SITE LOCATION
SGS Quadrangle Name: New Haven WV-OH NRC	S Soli Map Page: NRCS Soil Map Stream Order
unity: Meigh County Township/(	
MISCELLANEOUS	
ase Flow Conditions? (Y/N): $\underline{Y}$ Date of last precipitation: $\underline{11/29/}$	05 Quantity: unknorm
hotograph Information:84	
levated Turbidity? (Y/N): N Canopy (% open): 35	
ere samples collected for water chemistry? (Y/N): (Note lab samp	e no. or id. and attach results) Lab Number:
eld Measures: Temp (*C) Dissolved Oxygen (mg/)	pH (S.U.) Conductivity (µmhos/cm)
the sampling reach representative of the stream (Y/N) Y If not, please	
dilianal comments/description of pollution impacts:	
	ctions optional. NOTE all voucher samples must be labeled with the s
BIOTIC EVALUATION enformed? (Y/N): (If Yes, Record all observations. Voucher colle ID number. Include appropriate field data shee	ctions optional. NOTE all voucher samples must be labeled with the sits from the Primary Headwater Habital Assessment Manual)
BIOTIC EVALUATION erformed? (Y/N): (If Yes, Record all observations. Voucher colle ID number. Include appropriate field data shee ish Observed? (Y/N) Salamanders Observ	ctions optional. NOTE all voucher samples must be labeled with the si its from the Primary Headwater Habitat Assessment Manual) ed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION erformed? (Y/N): (If Yes, Record all observations. Voucher colle ID number. Include appropriate field data shee ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observ rogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Mar	ctions optional. NOTE all voucher samples must be labeled with the si its from the Primary Headwater Habitat Assessment Manual) ed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION enformed? (Y/N): (If Yes, Record all observations. Voucher colle ID number. Include appropriate field data shee sh Observed? (Y/N) Voucher? (Y/N) Salamanders Observ rogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Mar	ctions optional. NOTE all voucher samples must be labeled with the si its from the Primary Headwater Habitat Assessment Manual) ed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION enformed? (Y/N): (If Yes, Record all observations. Voucher colle ID number. Include appropriate field data shee ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observ rogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Mar	ctions optional. NOTE all voucher samples must be labeled with the si its from the Primary Headwater Habitat Assessment Manual) ed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION         Performed? (Y/N):       N         (If Yes, Record all observations. Voucher colle         ID number. Include appropriate field data shee         Sish Observed? (Y/N)       Voucher? (Y/N)         Frogs or Tadpoles Observed? (Y/N)       Voucher? (Y/N)         Comments Regarding Biology:	ctions optional. NOTE all voucher samples must be labeled with the sits from the Primary Headwater Habital Assessment Manual) ed? (Y/N) Voucher? (Y/N) croinvertebrates Observed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION erformed? (Y/N): (If Yes, Record all observations. Voucher colle ID number. Include appropriate field data shee ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observ rogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Mar	ctions optional. NOTE all voucher samples must be labeled with the sits from the Primary Headwater Habital Assessment Manual) ed? (Y/N) Voucher? (Y/N) croinvertebrates Observed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION Performed? (Y/N): (If Yes, Record all observations. Voucher colle ID number. Include appropriate field data shee Sish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? Progs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Mar Comments Regarding Biology:	ctions optional. NOTE all voucher samples must be labeled with the sits from the Primary Headwater Habitat Assessment Manual) ed? (Y/N) Voucher? (Y/N) croinvertebrates Observed? (Y/N) Voucher? (Y/N) STREAM REACH (This must be completed);
	ctions optional. NOTE all voucher samples must be labeled with the side from the Primary Headwater Habital Assessment Manual) ed? (Y/N)
	ctions optional. NOTE all voucher samples must be labeled with the sits from the Primary Headwater Habitat Assessment Manual) ed? (Y/N) Voucher? (Y/N) croinvertebrates Observed? (Y/N) Voucher? (Y/N) STREAM REACH (This must be completed);
BIOTIC EVALUATION  Performed? (Y/N):	ctions optional. NOTE all voucher samples must be labeled with the side from the Primary Headwater Habital Assessment Manual) ed? (Y/N)
	ctions optional. NOTE all voucher samples must be labeled with the side from the Primary Headwater Habital Assessment Manual) ed? (Y/N)
BIOTIC EVALUATION erformed? (Y/N):	ctions optional. NOTE all voucher samples must be labeled with the side from the Primary Headwater Habital Assessment Manual) ed? (Y/N)
BIOTIC EVALUATION erformed? (Y/N):	ctions optional. NOTE all voucher samples must be labeled with the side from the Primary Headwater Habital Assessment Manual) ed? (Y/N) Voucher? (Y/N) croinvertebrates Observed? (Y/N) Voucher? (Y/N) croinvertebrates Observed? (Y/N) Voucher? (Y/N) STREAM REACH (This must be completed): evaluation and a narrative description of the stream's location
BIOTIC EVALUATION rformed? (Y/N): (If Yes, Record all observations. Voucher colle ID number. Include appropriate field data shee sh Observed? (Y/N) Voucher? (Y/N) Salamanders Observ ogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Mai comments Regarding Biology: ORAWING AND NARRATIVE DESCRIPTION OF Include important landmarks and other features of interest for site Q. Alba Q. Alba Q. Alba	clions optional. NOTE all voucher samples must be labeled with the sits from the Primary Headwater Habital Assessment Manual) ed? (Y/N) Voucher? (Y/N) voucher? (Y/N) croinvertebrates Observed? (Y/N) Voucher? (Y/N) STREAM REACH (This must be completed): evaluation and a narrative description of the stream's location

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## ChieEPA Primary Headwater Habitat Evaluation Form (Lass T HHEI Score (sum of metrics 1, 2, 3) :

LENGTH OF STREAM REACH (11) $1001$ DATE $12 - 1 - 05$ scorer $BEY$	M-519 RIVER BASIN LATLONG RIVER	CODE RIVER MILE
		ERING CORECENT OR NO RECOVERY
(Max of 32). Add total number of significa		re is sum of boxes A & B.PERCENTHHEIMetricPERCENT $\sqrt{70}$ SubstrateNew 5 40
<ul> <li>Maximum Pool Depth (Measure the mevaluation. Avoid plunge pools from road &gt; 30 centimeters [20 pts]</li> <li>&gt; 22:5 - 30 cm [30 pts]</li> <li>&gt; 10:-22:5 cm [25 pts]</li> <li>COMMENTS</li></ul>		boxý:
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' B') [20 pts] COMMENTS	☐ >1.0 m (≤ 3 3") [5 pts]	
Stream Flowing Subsurface flow with isolated por COMMENTS	FLOODPLAIN QUALITY         L       R       (Most Predominant per Bank)         Mature Forest, Wetland         Immature Forest, Wetland         Immature Forest, Shrub or Old         Field         Immature Forest, New Field         Imm	
STREAM GRADIENT ESTIMATE	1.0 2.0 1.5 2.5 Moderate (21//100 /l) Moderate to S	3.0 3 3 ievere (10 fr/100 ft)

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ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed	<u>a:</u> 13M-519
CHEI PERFORMED? - DYes No QHEI Score (If Yes, .	Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	
CWH Name:	
D EWH Name:	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE <u>ENTIRE</u> WATERSI	HED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: NRCS Soil M	lap Page: NRCS Soil Map Stream Order
County: Melga County Township / City:	<u></u>
MISCELLANEOUS	-
Base Flow Conditions? (Y/N): Date of last precipitation:	Quantity:
Photograph information: 1- Photo # 81 - Concord (	Camera
Elevated Turbidity? (Y/N): Canopy (% open):	
i i	r id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U	J.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) $\sqrt{2}$ If not, please explain	);
(	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Voucher collections op ID number. Include appropriate field data sheets from the	ational. NOTE: all voucher samples must be labeled with the site he Primary Headwater Habital Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N	
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinverk	lebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
DRAWING AND NARRATIVE DESCRIPTION OF STREA	AM REACH (This <u>must</u> be completed):
Include Important landmarks and other features of interest for site evaluation	ion and a narrative description of the stream's location
FLOW - A - A - A - A - A - A - A - A - A -	
FLOW	
PAT BMS-16	
BENEL' BEWESFE	
Str. X	· · · · · · · · · · · · · · · · · · ·
\$ <sup>7</sup>	
PHWH Form Page - 2	2

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#### ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3): 33

SITE NAME/L	OCATION AMP Obio				
			l	DRAINAGE AREA (mi²)	Imiz
	STREAM REACH (R) 200				
	<u>- OS</u> SCORER <u>REM</u>				·····
	mplete All Items On This For	m - Refer to "Field Evalu	ation Manual for Ohio's I	PHWH Streams" for Instru	ictions
STREAM C MODIFICA		TURAL CHANNEL . 🗍 REC	OVERED. CRECOVERIN		VERY
	STRATE (Estimate percent of ev				
(Max TYPE	t of 32). Add total number of signific I	PERCENT TYPE	-	PERCENT	HHEI Metrie
	BLDR SLABS [16 pis]				Point
	30ULDER (>256 mm) [16 pts] 3EDROCK [16 pt]		EAF PACKWOODY DEBRIS		Substra
	COBBLE (66-256 mm) [12 pts]		INE DETRITUS [3 pts] LAY or HARDPAN [0 pt]		Max = 4
	3RAVEL (2-64 mm) [9 pts] . SAND (<2 mm) [6 pts] .		AUCK [0 pts] RTIFICIAL [3 pts]	· · · · · · · · · · · · · · · · · · ·	-18
			A		
	Total of Percentages of Slabs, Boulder, Cobble, Bedrock _	[ { · · }		(B) 3	A+B
SCORE OF 1		STRATE TYPES:	TOTAL NUMBER OF SU	BSTRATE TYPES:	
	imum Pool Depth (Measure the r				Pool De
	uation. Avoid plunge pools from roa centimeters [20 pts]	i 💭 🖓 🖉	c) (Check OVLY one box) > 5 cm - 10 cm [15 pts]		<u>Max = :</u>
	5 - 30 cm [30 pts] - 22 5 cm [25 pts]		< 5 cm [5 pts] NO WATER OR MOIST CHA	NNEL IO otel	$  \bigcirc$
>10	5 - 30 cm (30 pts) - 22.5 cm (25 pts) MMENTS		< 5 cm [5 pts] NO WATER OR MOIST CHA MAXIMUM POOL DEF		0
> 10 COM 3BAN	- 22.5 cm (25 pts) MIENTS JK FULL WIDTH (Measured as th		NO WATER OR MOIST CHA	TH (centimeters):	
→ 10 COM 3. BAN □ > 4.0 □ > 3.0	- 22.5 cm (25 pts)		NO WATER OR MOIST CHA	TH (centimeters):	Width
□ > 10 COM 3. BAM □ > 4.0 □ > 3.0	- 22.5 cm (25 pts) MIENTS JK FULL WIDTH (Measured as th meters (> 13) (30 pts)	e average of 3-4 measureme	MAXIMUM POOL DEF MAXIMUM POOL DEF mts) (Check ONLY > 1.0 m - 1.5 m (> 3"3" - 4"8")	TH (centimeters):	Width
□ > 10 COM 3. BAN □ > 3.0 □ > 3.0 □ > 1.5	- 22.5 cm [25 pts] MIENTS	e average of 3-4 measureme	MAXIMUM POOL DEF MAXIMUM POOL DEF mts) (Check ONLY > 1.0 m - 1.5 m (> 3"3" - 4"8")	one box): ) [15 pts]	Bankfu Width Max=30
□ > 10 COM 3. BAN □ > 3.0 □ > 3.0 □ > 1.5	- 22.5 cm [25 pts] MIENTS	e average of 3-4 measureme	NO WATER OR MOIST CHA           MAXIMUM POOL DEF           mts)         (Check ONLY           > 1.0 m         1.5 m         > 3"3" 4 8"           < 1.0 m	one box): ) [15 pts]	Width
□ > 10 COM 3. BAN □ > 3.0 □ > 3.0 □ > 1.5	- 22.5 cm [25 pts] MIENTS	e average of 3-4 measureme	NO WATER OR MOIST CHA           MAXIMUM POOL DEF           mts)         (Check ONLY           > 1.0 m         1.5 m         > 3"3" 4 8"           < 1.0 m	TH (centimeters): one box): ) [15 pts] L WIDTH (meters)	Width
□ > 10 COM 3. BAN □ > 3.0 □ > 3.0 □ > 1.5	- 22.5 cm [25 pts] MIENTS	E average of 3-4 measurements This information mu PLAIN QUALITY CHOOT	NO WATER OR MOIST CHA           MAXIMUM POOL DEF           Ints)         (Check ONLY           > 1.0 m         1.5 m         > 3" 4 8"           < 1.0 m	TH (centimeters): one box): ) [15 pts] L WIDTH (meters)	Width
□ > 10 COM 3. BAN □ > 3.0 □ > 3.0 □ > 1.5	- 22.5 cm [25 pts] MIENTS	E average of 3-4 measurements This information mu PPLAIN QUALITY TRNOT FLOODPLAIN QUALITY	NO WATER OR MOIST CHA           MAXIMUM POOL DEF           Ints)         (Check ONLY           > 1.0 m         1.5 m         > 3" 4 8"           < 1.0 m	TH (centimeters): one box): )[15 pts] L WIDTH (meters)	Width
□ > 10 COM 3. BAN □ > 3.0 □ > 3.0 □ > 1.5 COM	- 22.5 cm [25 pts] MMENTS JK FULL WIDTH (Measured as th meters (> 13') [30 pts] m - 4.0 m (> 9' 7" - 13') [26 pts] m - 3.0 m (> 9' 7" - 4' 8") [20 pts] MMENTS RIPARIAN ZONE AND FLOOD RIPARIAN VIDTH R (Per Bank) Wide > 10m	This information mu PLAIN QUALITY THOT FLOOPLAIN QUALITY L R (Most Predom Mature Forest, Immature Forest,	NO WATER OR MOIST CHA           MAXIMUM POOL DEF           Ints)         (Check ONLY           > 1.0 m         1.5 m         > 3" 4 8"           < 1.0 m	PTH (centimeters): one box): ) [15 pts] L WIDTH (meters) ) as looking downstream A R Conservation Tillage	Width
□ > 10 COM 3. BAN □ > 4.0 □ > 3.0 □ > 1.5 COM	- 22.5 cm [25 pts] MENTS JK FULL WIDTH (Measured as th meters (> 13') [30 pts] m - 4.0 m (> 9' 7" - 13') [26 pts] m - 3.0 m (> 9' 7" - 4' 8") [20 pts] MMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH (Per Bank) UNde > 10m Moderate 5-10m	E average of 3-4 measureme This information <u>mu</u> DPLAIN QUALITY \$PNOT <u>FLOODPLAIN QUALITY</u> L R (Most Predom Mature Forest,	NO WATER OR MOIST CHARA         MAXIMUM POOL DEF         Ints)       (Check ONLY         > 1.0 m       1.5 m (> 3" 3" + 4" 8")         ≤ 1.0 m (< 3" 3") [5 pts]	TH (centimeters): one box): (15 pts) L WIDTH (meters) ) as looking downstream 1 Conservation Tillage Urban or Industrial Open Pasture, Row	Width
□ > 10 COM 3. BAN □ > 3.0 □ > 3.0 □ > 1.5 COM	- 22.5 cm [25 pts] MENTS	PLAIN QUALITY ANOT FLOODPLAIN QUALITY L R (Most Predom Mature Forest, Immature Fore Field	NO WATER OR MOIST CHA          MAXIMUM POOL DEF           mts)         (Check ONLY           > 1.0 m         1.5 m         > 3 3 - 4 8 3           < 1.0 m	PTH (centimeters):         one box):         (15 pts)         L WIDTH (meters)         as looking downstream \$r         R         Conservation Tillage         Urban or Industrial         Open Pasture, Row Crop	Width
□ > 10 COM 3. BAN □ > 4.0 □ > 3.0 □ > 1.5 COM □ □ □ □ □ □ □ □ □ □ □ □ □	- 22.5 cm [25 pts] MMENTS IK FULL WIDTH (Measured as th meters (> 13') [30 pts] m - 4.0 m (> 9' 7" - 4' 8") [20 pts] m - 3.0 m (> 9' 7" - 4' 8") [20 pts] MMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH (Per Bank) Wide > 10m Moderate 5-10m Narrow <5m	e average of 3-4 measureme         This information mu         DPLAIN QUALITY         FLOODPLAIN QUALITY         L         R         (Most Predom)         Mature Forest,         Immature Fore         Field	NO WATER OR MOIST CHA           MAXIMUM POOL DEF           ints)         (Check ONLY           > 1.0 m - 1.5 m (> 3" 3" - 4' 6")           ≤ 1.0 m (≤ 3" 3") [6 pts]           ≤ 1.0 m (≤ 3" 3") [6 pts]           AVERAGE BANKFUL           st also be completed           E: River Left (L) and Right (R           inant per Bank)         L           Wetland         □ 1           ark, New Field         □ 1	PTH (centimeters):         one box):         (15 pts)         L WIDTH (meters)         as looking downstream \$r         R         Conservation Tillage         Urban or Industrial         Open Pasture, Row Crop	Width
□ > 10 COM 3. BAM □ > 3.0 □ > 3.0 □ > 1.5 COM □ □ □ □ □ □ □ □ □ □ □ □ □	- 22.5 cm [25 pts] MMENTS JK FULL WIDTH (Measured as th meters (> 13') [30 pts] m - 4.0 m (> 9' 7" - 4' 8") [20 pts] m - 3.0 m (> 9' 7" - 4' 8") [20 pts] MMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH (Per Bank) Wide > 10m Moderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time of Ev	e average of 3-4 measureme         Image: State of the state of t	NO WATER OR MOIST CHA           MAXIMUM POOL DEF           Ints)         (Check ONLY           > 1.0 m< 1.5 m (> 3" 3" - 4' 6")           ≤ 1.0 m (≤ 3" 3") [5 pts]           ≤ 1.0 m (≤ 3" 3") [5 pts]           AVERAGE BANKFUL           st also be completed           E: River Left (L) and Right (R           inant per Bank)         L           Wetland         I           ark, New Field         I           ps	PTH (centimaters):         one box):         (15 pts)         L WIDTH (meters)         as looking downstream \$r         R         Conservation Tillage         Urban or Industrial         Open Pasture, Row         Crop         Mining or Construction	Width Max=3
□ > 10 COM 3. BAN □ > 4.0 □ > 3.0 □ > 1.5 COM □ □ 0 □ 0 □ 0 □ 0 □ 0 □ 0 □ 0	- 22.5 cm [25 pts] MMENTS JK FULL WIDTH (Measured as th meters (> 13') [30 pts] m - 4.0 m (> 9' 7" - 4' 8") [20 pts] m - 3.0 m (> 9' 7" - 4' 8") [20 pts] MMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH (Per Bank) Wide > 10m Moderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time of Ev Stream Flowing Subsurface flow with isolated po	This information <u>mu</u> DPLAIN QUALITY TNOT <u>FLOODPLAIN QUALITY</u> L R (Most Predomi Mature Forest, Immature Forest, Immature Fore Field Fenced Pasture reluation) (Check ONLY one	NO WATER OR MOIST CHA           MAXIMUM POOL DEF           Ints)         (Check ONLY           > 1.0 m< 1.5 m (> 3" 3" - 4' 6")           ≤ 1.0 m (≤ 3" 3") [5 pts]           ≤ 1.0 m (≤ 3" 3") [5 pts]           AVERAGE BANKFUL           st also be completed           E: River Left (L) and Right (R           inant per Bank)         L           Wetland         I           ark, New Field         I           ps	PTH (centimaters):         one box):         (15 pts)         (15 pts)         L WIDTH (meters)         as looking downstream \$r         R         Conservation Tillage         Urban or Industrial         Open Pasture, Row         Crop         Mining or Construction         ted pools, no flow (Intermittent)	Width Max=3
□ > 10 COM 3. BAM □ > 3.0 □ > 3.0 □ > 1.5 COM □ □ □ □ □ □ □ □ □ □ □ □ □	- 22.5 cm [25 pts] MENTS	This information <u>mu</u> PLAIN QUALITY TO FLOODPLAIN QUALITY L R (Most Predomi Mature Forest, Mature Forest,	NO WATER OR MOIST CHA         MAXIMUM POOL DEF         Ints)       (Check ONLY         > 1.0 m - 1.5 m (> 3' 3' - 4' 8")         ≤ 1.0 m (≤ 3' 3') [6 ptn]         ≤ 1.0 m (≤ 3' 3') [6 ptn]         AVERAGE BANKFUL         st also be completed         E: River Left (L) and Right (R         inant per Bank)       L         Wetland       I         ark, New Field       I         ark, New Field       I         box):       Moist Channel, isolat         Dry channel, no wate       I	PTH (centimaters):         one box):         (15 pts)         (15 pts)         L WIDTH (meters)         as looking downstream \$r         R         Conservation Tillage         Urban or Industrial         Open Pasture, Row         Crop         Mining or Construction         ted pools, no flow (Intermittent)	Width Max=3
□ > 10 COM 3. BAN > 4.0 > 3.0 □ > 3.0 □ > 1.5 COM □ □ □ □ □ □ □ □ □ □ □ □ □	- 22.5 cm [25 pts] MMENTS JK FULL WIDTH (Measured as th meters (> 13') [30 pts] m - 4.0 m (> 9' 7" - 4' 8") [20 pts] m - 3.0 m (> 9' 7" - 4' 8") [20 pts] MMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH (Per Bank) Wide > 10m Moderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time of Ev Stream Flowing Subsurface flow with isolated po	This information <u>mu</u> PLAIN QUALITY TO FLOODPLAIN QUALITY L R (Most Predomi Mature Forest, Mature Forest,	NO WATER OR MOIST CHA         MAXIMUM POOL DEF         Ints)       (Check ONLY         > 1.0 m - 1.5 m (> 3' 3' - 4' 8")         ≤ 1.0 m (≤ 3' 3') [6 ptn]         ≤ 1.0 m (≤ 3' 3') [6 ptn]         AVERAGE BANKFUL         st also be completed         E: River Left (L) and Right (R         inant per Bank)       L         Wetland       I         ark, New Field       I         ark, New Field       I         box):       Moist Channel, isolat         Dry channel, no wate       I	PTH (centimaters):         one box):         (15 pts)         L WIDTH (meters)         as looking downstream \$r         R         Conservation Tillage         Urban or Industrial         Open Pasture, Row         Crop         Mining or Construction         ted pools, no flow (Intermittent)	Width Max=3
□ > 10 COM 3. BAN > 3.0 > 3.0 > 1.5 COM □ > 1.5 COM	- 22.5 cm [25 pts] MMENTS JK FULL WIDTH (Measured as the meters (> 13') [30 pts] m - 4.0 m (> 9' 7" - 4' 8") [20 pts] m - 3.0 m (> 9' 7" - 4' 8") [20 pts] MMENTS RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH (Per Bank) Wide > 10m Moderate 5-10m None COMMENTS FLOW REGIME (At Time of Events Stream Flowing Subsurface flow with isolated per COMMENTS SINUOSITY (Number of bends	This information <u>mu</u> PLAIN QUALITY PROT <u>FLOOPLAIN QUALITY</u> L R (Most Predom Mature Forest, Mature Fores	NO WATER OR MOIST CHA         MAXIMUM POOL DEF         Ints)       (Check ONLY         > 1.0 m< 1.5 m (> 3' 3'' + 6'')         ≤ 1.0 m (< 3' 3'') [5 pts]	PTH (centimaters):         one box):         one box):         (15 pts)         L WIDTH (meters)         as looking downstream \$         R         Conservation Tillage         Urban or Industrial         Open Pasture, Row         Crop         Mining or Construction         ted pools, no flow (Intermittent)         er (Ephemeral)	Width Max=34

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed): BM - S 20
QHEI PERFORMED? - 🗍 Yes 📈 No QHEI Score (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)
WWH Name: Distance from Evaluated Stream O CWH Name: Distance from Evaluated Stream
EWH Name: Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: New Hoven, WV-OH NRCS Soil Map Page: NRCS Soil Map Stream Order
county: Meigh courty Township/ City: Letart Julia, Ohioarea
MISCELLANEOUS
Base Flow Conditions? (Y/N): Y Date of last precipitation: 11-29-05 Quantity: with norm
Photograph Information: $y - Phota \neq 85$
Elevated Turbidity? (Y/N): N Canopy (% open): 40%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
is the sampling reach representative of the stream (Y/N)
Additional comments/description of pollution impacts:
Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Comments Regarding Biology:
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location
FLOW BRUE 2' BFWE 2' BFWE 2' BFWE 2' BFWE 2'

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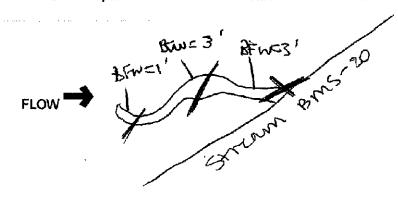
## ChigEPA Primary Headwater Habitat Evaluation Form معمد HHEl Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION		
STEAM SITE NUMBER BM		
LENGTH OF STREAM REACH (#)	T LONG RIVER	R CODE RIVER MILE
DATE 2-1-05 SCORER BEM	COMMENTS drams into strea	m Bms-20
NOTE: Complete All items On This Form -		
STREAM CHANNEL ONONE / NATUR		
	type of substrate present. Check ONLY two pr	
	substrate types found (Max of 8). Final metric so <u>CENT</u> <u>TYPE</u>	PERCENT Metric
BLDR SLABS [16 pts]		
		Substrate
COBBLE (65-256 mm) [12 pts]		
□ ☑ GRAVEL (2-64 mm) [9 pts] □ ☑ SAND (<2 mm) [6 pts] ∠		
Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock	ATE TYPES: 15 TOTAL NUMBER	(B) A + B
	imum pool depth within the 61 meter (200 ft) (	evaluation reach at the time of Pool Depth
evaluation. Avoid plunge pools from road c	ulverts or storm water pipes) (Check ONLY or	ne box): Max = 30
> 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts]	☐ > 5 cm - 10 cm [15 pt ☐ < 5 cm [5 pts]	s)
D > 10 - 22.5 cm [26 pts]		
COMMENTS	MAXIMUM POO	DL DEPTH (centimeters):
3. BANK FULL WIDTH (Measured as the av	verage of 3-4 measurements) (Check	ONLY one box): Bankfull
□         > 4.0 meters (> 13') [30 pts]           □         > 3.0 m + 4.0 m (> 9' 7" + 13') [25 pts]	💭 > 1.0 m - 1.5 m (> 3 3	-4 87) [15 pts] Width
□ > 1.5 m - 3.0 m (> 9' 7" - 4'8") [20 pts]	⊠ ≤ 1.0 m (≤ 3°3") [6 pt	
COMMENTS	AVERAGE BAI	
	This information must also be completed	
RIPARIAN ZONE AND FLOODPL/ RIPARIAN WIDTH	AIN QUALITY ☆NOTE: River Left (L) and R FLOODPLAIN QUALITY	Right (R) as looking downstream ⊈
L/R / (Per Bank)	L R (Most Predominant per Bank)	LR
⊡ ⊡ Wide >10m	Mature Forest, Wetland	Conservation Tillage
D D Moderate 5-10m	Field	Urban or Industrial
□ □ Narrow <5m	Residential, Park, New Field	Open Pasture, Row Crop
	Fenced Pasture	Mining or Construction
FLOW REGIME (At Time of Evalue Stream Flowing Subsurface flow with isolated pools COMMENTS	Moist Channe	el, isolated pools, no flow (Intermittent) no water (Ephemeral)
SINUOSITY (Number of bends per	61 m (200 fi) of channel) (Check ONLY one ba	ox):
None     O     0.5	1.0 <b>(1</b> ) 2.0 1.5 <b>(1</b> ) 2.5	. <b>3</b> .0 <b>3</b> .0
	1.9 2,9	· · ·
STREAM GRADIENT ESTIMATE	Moderate (2 ft/100 ft) OModerate to	

	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
] www.H Name:	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE	
SGS Quadrangle Name: <u>New Harren, WV-OH</u> NRO	CS Soil Map Page: NRCS Soil Map Stream Order
iounty: Margel Calaty Township/	city: Letart Falls, Ohio are
MISCELLANEOUS	
ase Flow Conditions? (Y/N): $\gamma$ Date of last precipitation: <u>11-24</u>	-05_ Quantity: university
hotograph information: <u>Y- pho to 86</u>	
ilevated Turbidity? (Y/N): <u>N</u> Canopy (% open): <u>30</u> 00	-
Vere samples collected for water chemistry? (Y/N): _// (Note lab sam	ple no. or id. and attach results) Lab Number:
ield Measures: Temp (*C) Dissolved Oxygen (πg/l)	pH (S.U.) Conductivity (umbos/cm)
	••••••••••••••••••••••••••••••••••••••
the sampling reach representative of the stream (Y/N) If not, please	e explain:
· · · · · · · · · · · · · · · · · · ·	
Additional comments/description of pollution impacts:	
Contract Contraction of policition impacts.	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Voucher colle ID number. Include appropriate field data she	ections optional. NOTE: all voucher samples must be labeled with ets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Obser Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Ma	ved? (Y/N) Voucher? (Y/N)
TOgs of Laupoies Observed's (TIN) Vouchers (TIN), Aqualic MR	The second

#### DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



#### Primary Headwater Habitat Evaluation Form

HHEI SCORE (sum of metrics 1, 2, 3) ;

modified Class I

and a strategy of the strategy

214

SITE NAME/LOCATION AMPON RIVER BASIN DRAINAGE AREA (mi²) \_ LENGTH OF STREAM REACH (II) \_ LAT. LONG. RIVER CODE RIVER MILE Loufly SCORER N. DATE 29 COMMENTS NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions DINONE / NATURAL CHANNEL DIRECOVERED RECOVERING DIRECENT OR NO RECOVERY STREAM CHANNEL **MODIFICATIONS:** SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes HHEI (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. Metric TYPE PERCENT 40 PERCENT Points BLDR SLABS [16 pts] SILT [3 pt] 00 LEAF PACK/WOODY DEBRIS [3 pts] 00 BOULDER (>256 mm) [16 pts]  $\mathbf{x}$ Substrate 00 00 FINE DETRITUS [3 pts] BEDROCK [16 pt] Max# 40 00 00 COBBLE (65-256 mm) [12 pts] CLAY or HARDPAN [0 pt] 00 00 20 MUCK [0 pts] GRAVEL (2-64 mm) [9 pts] ØO 00 ARTIFICIAL [3 pts] SAND (<2 mm) [6 pts] Total of Percentages of (8) (Al A+B O Bidr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of **Pool Depth** 2. evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): Max # 30 > 30 centimeters [20 pts] Ο > 5 cm - 10 cm [15 pts] ٥ ſ > 22.5 - 30 cm [30 pts] < 5 cm [5 pts] O > 10 - 22.5 cm [25 pts] D NO WATER OR MOIST CHANNEL [0 pts] るい CURVARY አንዲት/ MAXIMUM POOL DEPTH (centimeters): Falming COMMENTS BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Bankfull 3 Ο 8 > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] Width > 4.0 meters (> 13') [30 pts] Ο > 3.0 m > 4.0 m (> 9'7" - 13') [25 pts] ≤ 1.0 m (≤ 3' 3') [5 pts] Max=30 > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters) This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY なNOTE: River Left (L) and Right (R) as looking downstreamな RIPARIAN WIDTH FLOODPLAIN QUALITY (Per 8ank) (Most Predominant per Bank) R ŌΟ 00 Mature Forest, Wetland Conservation Tillage ПΓ Wide >10m Immature Forest, Shrub or Old 00 ΠΠ XX Urban or Industrial Moderate 5-10m Field Open Pasture, Row 00 00 00 Residential, Park, New Field Narrow <5m Cmg 00 00 00 None Fenced Pasture Mining or Construction COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box); Moist Channel, isolated pools, no flow (intermittent) Stream Flowing Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral) COMMENTS\_ SINUOSITY (Number of bands per 61 m (200 ft) of channels, (Check ONLY one box): None 1.0 2.0 3.0  $\square$ n п 2.5 0.5 1.5 >3 STREAM GRADIENT ESTIMATE X Moderate to Severe Severe (10 m/100 h) Flat (0.5 nv100 ll) Fiat to Moderate Moderate (2 (V100 /I))

	BS-1
ADDITIONAL STREAM INFORMATION (This information Must Also be	Completed):
	(If Yes, Attach Completed QHEt Form)
DOWNSTREAM DESIGNATED USE(S)	
	Distance from Evaluated Stream
	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIR	E WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: New Haven, WV-OHN	RCS Soil Map Page: NRCS Soil Map Stream Order
USGS Quadrangle Name: <u>New Kaven, WV-OH</u> N County: <u>Meigh</u> Township	1011 Letart Falls, Ohio area
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of tast precipitation:/	19/05 quantity: untinon
Photograph Information: YIS	
Elevated Turbidity? (Y/N): $\frac{\sigma N}{N}$ Canopy (% open): <u>25</u>	```*•
Were samples collected for water chemistry? (Y/N): <u>N</u> (Note lab sa	mple no. or id. and attach results) Lab Number
Field Measures: Temp (°C) Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity (umhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, ple	
Additional comments/description of pollution impacts:	
	_
BIOTIC EVALUATION	
	Rections optional. NOTE; all voucher samples must be labeled with the site
	eets from the Primary Headwater Habital Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed?	eved? (Y/N) Voucher? (Y/N)
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic I	Ascroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
	F STREAM REACH (This must be completed): ite evaluation and a narrative description of the stream's location
an ended	Not los la la
A/11 Cmar	fert / S hart hte
2 M21 11111	Xundure
FLOW A Channel ,	
	ferer /
	hand a
	hand 2

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October 24, 2002 Revision

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modified Class IT Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3); 40

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SITE NAMELOCATION			
	_ RIVER BASIN		/mi²)
LENGTH OF STREAM REACH (R) LAT.	MMENTS 14, 37	· · · · · · · · · · · · · · · · · · ·	
NOTE: Complete All items On This Form - Refer to	6		
•			
STREAM CHANNEL IN NONE / NATURAL CHAP MODIFICATIONS:	NNEL LI RECOVERED COMME		NO RECOVERY
	P*	·	
1. SUBSTRATE (Estimate percent of every type of se		•••••••••••••••••••••••••••••••••••••••	
(Max of 32). Add total number of significant substrate TYPE PERCENT	<ul> <li>types found (Max of 8). Final metri TYPE.</li> </ul>	c score is sum of boxes A & B. PERCEN	T Metric
U BLOR SLABS [16 pts]		40	
Image: Second system         S			Substrate
COBBLE (65-256 mm) [12 pts]	CLAY or HARDPAN	[0 pt]	Max = 40
GRAVEL (2-64 mm) [9 pts]	MUCK [0 pts]	70	25
□ □	🗍 🗍 🛛 ARTIFICIAL (3 pts)		
Total of Percentages of Bidr Slabs, Boukler, Cobble, Bedrock	(A) 19	(8)	/ A+B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYP		ER OF SUBSTRATE TYPES:	Le
2. Maximum Pool Depth (Measure the maximum pool	ol depth within the 61 meter (200	ft) evaluation reach at the time	of Pool Depth
evaluation. Avoid plunge pools from road culverts or	storm water pipes) (Check ONL)	one box):	Max = 30
> 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts]	☐ > 5 cm - 10 cm [14 ☐ _ < 5 cm <b>(5 pts</b> ]	o ptsj	
□ > 10 - 22.5 om [25 pts]		IOIST CHANNEL [0 pts]	$\odot$
COMMENTS		POOL DEPTH (centimeters):	
3BANK FULL WIDTH (Measured as the average of		ck ONLY one box]:	Bankfull
└ > 4.0 meters (> 13') [30 pts] □ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	∑ZK > 1.0 m - 1.5 m (>: □ ≤ 1.0 m (≤ 3*3*)]5		Width Max=30
□ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]			116
COMMENTS	AVERAGE	BANKFULL WIDTH (meters)	12
This i RIPARIAN ZONE AND FLOODPLAIN QUAL	information <u>must</u> also be comple .ITY ☆NOTE: River Left (L) an	ted d Right (R) as looking downstre	fzme
RIPARIAN WIDTH FLOODF	LAIN QUALITY		
L R (Per Bank) Wide >10m	(Most Predominant per Bank) Mature Forest, Welland	L R Conservation	Tillage
Moderate 5-10m	Immature Forest, Shrub or Old	Urban or Indu	•
	Field Residential, Park, New Field	Open Pasture	, Row
	Fenced Pasture	Crop D Mining or Con	struction
COMMENTS			
FLOW REGIME (At Time of Evaluation) (C	heck ONLY one box):		
<ul> <li>Stream Flowing</li> <li>Subsurface flow with isolated pools (interstitie</li> </ul>		nnel, isolated pools, no flow (inf et. np. water (Ephemeral)	ermittent)
COMMENTS			
SINUOSITY (Number of bends per 61 m (20	0 ft) of channel) <u>(Check ONLY</u> on	e box):	
None 1.0 0.5 1.5	2.0		
	×	1. 28 <b>- 19</b>	
STREAM GRADIENT ESTIMATE	erale (2 10100 m) Oderati	e to Severe 🛛 Sev	efe (10 m/100 #)
<i>[</i>			

DUTUNAL STREAM INFORMATION IN the Information Must Also be Completed:         Del PERFORMED7 - [] 'ts' [] /ts' [] /ts		BS-1-2	
OHER PERFORMED? - [] Yes _ Leo Chill Score	DDITIONAL STREAM INFORMATION (This Information Must Also be Compl	etad):	
DOWNSTREAM DESIGNATED USE(5)       Distance from Evaluated Stream         DWH Hame:       Distance from Evaluated Stream         DEWN Hame:       Distance from Evaluated Stream         DEWN Hame:       Distance from Evaluated Stream         DEWN Hame:       MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE EXTIRE WATERSHIP AREA. CLEAR: WARK THE STE LOCATION         JSGB Guadangle Name:       Township / CBy:       Township / CBy:         MISSEELLANEOUS       Township / CBy:       Township / CBy:         States Flow Conditions? (VNN):       Date of tast precipitation:       1 49/10 5         Guanetity:       UFA       Canety (4 open):       DE         Hotograph Information:       J EA       Canety (4 open):       DE         Nette samples colleded for water chemistry? (YNI):       N (Note tab sample no. or id. and attach results) Lab Number:			
Diverse implicit of the stream       Distance from Evaluated Stream         ONH Name       Distance from Evaluated Stream         DVH Name       Distance from Evaluated Stream         DVH Name       Distance from Evaluated Stream         DVH Name       Distance from Evaluated Stream         DISOS Quadrange Name <u>How C MAPS</u> , HOLUDING THE <u>ENTINE</u> WATERSHED AREA. CLEARLY MARK THE STEE LOCATION         JSGE Quadrange Name <u>How C MAPS</u> , HOLUDING THE <u>ENTINE</u> WATERSHED AREA. CLEARLY MARK THE STEE LOCATION         JSGES Quadrange Name <u>How C MAPS</u> , HOLUDING THE <u>ENTINE</u> WATERSHED AREA. CLEARLY MARK THE STEE LOCATION         JSGES Quadrange Name <u>How C MAPS</u> , HOLUDING THE <u>ENTINE</u> WATERSHED AREA. CLEARLY MARK THE STEE LOCATION         JSGES Quadrange Name <u>How C MAPS</u> , HOLUDING THE <u>ENTINE</u> WATERSHED AREA. CLEARLY MARK THE STEE LOCATION         JSGES Cluadrange Name <u>MISCELLANEOUS</u> Sales Flow Conditions? (VIN)       Date of last precipitation	· · · · · · · · · · · · · · · · · · ·	es, Allach Completed Crici Pontij	
Dight Hame:			
DEVM: Name:			
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE <u>ENTERS</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         ISOS Quadrange Name: Num: Num: Num: Num: Num: Num: Num: Num			
BSGS Quadrangle Name: ?/WW / How ? My / OH       NRCS Soil Map Page:NRCS Soil Map Stream Order         County:	J CWR Name:		
Sourty:	**		
MISCELLANEOUS       Tote of list preceptation:	ISGS Quadrangle Name: / UW / Howen, , WV - UH NRCS So	I Map Page: NRCS Soil Map Stream Order	
hotograph information:   idevated Turbidity? (V/N):	County: <u>Meigh</u> Township / City:_		
hotsgraph information:	MISCELLANEOUS	105	
<pre>served Turbidity? (YNN): Canopy (% open):</pre>	ase Flow Conditions? (Y/N): Date of last precipitation:	Quantity: UN MOM	
Nere samples collected for water chemisky? (Y/N):			
Field Measures:       Temp (*C) Dissolved Oxygen (mg/i) pH (S.U) Conductivity (umhos/cm)         as the sampling reach representative of the stream (Y/N) If not, please explain:			
s the sampling reach representative of the stream (Y/N) ↓ If not, please explain:			
Inditional comments/description of pollution impacts:         EKOTIC EVALUATION         Performed? (YnN):       M         (if Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habital Assessment Manual)         Performed? (YnN):       Voucher? (VnN)         Salamanders Observed? (YnN)       Voucher? (VnN)         Voucher? (VnN)       Voucher? (VnN)         Voucher?       VnN         Include important landmarks and other features o			
BIOTIC EVALUATION         Performed? (Y/N):	s the sampling reach representative of the stream (Y/N) If not, please exp	lain:	
Performed? (Y/N):	dilicinal comments/description of pollution impacts:		
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): Include important landmarks and other features of Interest for site evaluation and anarrative description of the stream's location (hMm <sup>0</sup> ) FLOW	Performed? (Y/N):	m the Primary Headwater Habitat Assessment Manual) Y/N) Voucher? (Y/N)	•
FLOW			
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FLOW > Alle patety for the spin of the spi	Include important landmarks and other features of Interest for site evalu	ation and a narrative description of the stream's location	1
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October 24, 2002 Revision

# Primary Headwater Habitat Evaluation Form

	HME! Score (su	m of metrics 1, 2, 3) :
SITE NAME/LOCATIONAMY - OF		
	S-1-3 RIVER BASIN	
LENGTH OF STREAM REACH (ft)	LAT LONG RIVER	CODE RIVER MILE
DATE 1/04 05 SCORER MAL	-	
-	Refer to "Field Evaluation Manual for Ohics of the second seco	
STREAM CHANNEL	URAL CHANNEL CRECOVERED DRECOVE	RING DRECENT OR NO RECOVERY
MODIFICATIONS:		
(Max of 32). Add total number of significa         TYPE       Pi         BLDR SLABS [16 pts]       Pi         BOULDER (>256 mm) [16 pts]       Pi         BEDROCK [16 pt]       Pi         COBBLE (65-256 mm) [12 pts]       Pi	ry type of substrate present. Check ONLY two prevent substrate types found (Max of 8). Final metric sco	re is sum of boxes A & B. PERCENT 2.0 BRIS [3 pts] BRIS [3 pts] HHEI Metric Points Substrate May # 40
GRAVEL (2-64 mm) [9 pts]	<u>20</u> □ □ MUCK [0 pts] <u>()</u> □ □ ARTIFICIAL [3 pts]	<u> </u>
Total of Percentages of		(B) A+B
Bidr Slabs, Boulder, Cobble, Bedrock	D $ q $	15 1 11
		F SUBSTRATE TYPES:
	aximum pool depth within the 61 meter (200 ft) ev 1 culverts or storm water pipes) (Check ONLY one 5 cm - 10 cm [15 pts]	box):
3BANK FULL WIDTH (Measured as the	average of 3-4 measurements) (Check O	NLY one box): Bankfull
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	> 1.0 m - 1.5 m (> 3'3" - ↓ ≤ 1.0 m (≤ 3'3") [5 pts]	4' 8'') [15 pts] Width
	, D	15
COMMENTS Chapped wher	stright o-ATICALY AVERAGE BANK	(FULL WIDTH (meters)
RIPARIAN ZONE AND FLOODF RIPARIAN WIDTH	This information <u>must</u> also be completed LAIN QUALITY ☆NOTE: River Left (L) and Rig <u>FLOODPLAIN QUALITY</u> L.R. (Most Predominant per Bank)	ht (R) as looking downstream와
Wide >10m	Mature Forest, Wetland	Conservation Tillage
Moderate 5-10m	Field	Urban or Industrial
O O Narrow <5m	Residential, Park, New Field	Open Pasture, Row Crop
COMMENTS	Fenced Pasture	Mining or Construction
FLOW REGIME (At Time of Eva Stream Flowing Subsurface flow with isolated poc COMMENTS	is (Interstitial)	isolated pools, no flow (Intermittent) water (Ephemeral)
SINUOSITY (Number of bends )	ber 61 m (200 ft) of channel)         (Check ONLY one box           1.0         2.0           1.5         1.5	):
STREAM GRADIENT ESTIMATE	Moderate 12 IU 100 m	ievere 🗍 Severe (10 tv100 ti)

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ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) th Observed? (Y/N)		<u>Completed):</u>
Observed? (VM)       Observed? (VM)       If not, please stream (VM)         BIOTIC EVALUATION       (W excert of postulated appropriate field cate stream)       Observed? (VM)         BIOTIC EVALUATION       (W excert ? VM)       If not, please stream (VM)         BIOTIC EVALUATION       (W excert ? VM)       If not, please stream (VM)         Closerved? (VM)       (VM)       If not, please stream (VM)       With not, please stream (VM)         BIOTIC EVALUATION       (W excert and stream (VM)       If not, please explain:       Bitmed restream Mapping         BIOTIC EVALUATION       (W excert and stream (VM)       If not, please explain:       Bitmed restream Mapping         BIOTIC EVALUATION       (W excert and stream (VM)       If not, please stream of the stream Mapping       Vocation and stream Mapping         BIOTIC EVALUATION       (W excert and stream (VM)       If not, please explain:       Bitmed restream Mapping         BIOTIC EVALUATION       (W excert and stream (VM)       If not, please explain:       Bitmed stream Mapping         BIOTIC EVALUATION       (W excert and stream (VM)       If not, please explain:       Bitmed stream Mapping         BIOTIC EVALUATION       (W excert and stream VM)       Mapping of Teaples and stream Mapping       Vocation (VM)       Not the stream's location of the st	-	(# Yes, Attach Completed UHEL Form)
CMH Name:		Distance from Evaluated Stream
EWH Name:		
MARPHNG: ATTACH COPIES OF MAPS, INCLUDING THE ENTITE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         GB Causdrungie Name: Must Hower, MV - OHNRC'S Gal Map Page		
GS Quadragie Name: <u>How Howen</u> , <u>WV-OH</u> NRCS Soil Map Page:NRCS Soil Map Stream Order		
Inty:		
MBCELLANEOUS         be Flow Conditions? (Y/N):         Date of last precipitation		
MBCELLANEOUS         be Flow Conditions? (Y/N):         Date of last precipitation	unty: Meigh Township,	1011 Litart Falls, Ohio are
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valed Turbidity? (YN):	,	CIT CO CONTRACTOR CONT
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It is amples collected for water chemistry? (Y/N): N (Note teb sample no. or id. and attach results) Lab Number:  It Measures: Temp (*C) Dissolved Oxygen (mg/l)pH (S.U.) Conductivity (umhos/cm)	evated Turbidity? (Y/N): <u>N1</u> Canopy (% open): <u>50</u>	_
he sampling reach representative of the stream (YA) if not, please explain: b Ton NAN Toed ChanNJ12ed and A A A A A A A A A A A A A A A A A A A	are samples collected for water chemistry? (Y/N): (Note tab sam	nple no. or id. and attach results) Lab Number:
he sampling reach representative of the stream (YA) if not, please explain: b Ton NAN Toed ChanNJ12ed and A A A A A A A A A A A A A A A A A A A	Hol Measures: Temp (*C) Dissolved Oxvaen (ma/l)	pH (S.U.) Conductivity (umhos/cm)
Grd       M       M         Gillional comments/description of pollution impacts:		
diffional comments/description of pollution impacts:         BiOTIC EVALUATION         rformed? (Y/N):       N         (if Yes, Record all observations, Voucher collections optional. NOTE: all voucher samples must be labeled with the liD number. Include appropriate field data sheets from the Primary Headwater Habital Assessment Manual)         th Observed? (Y/N)       Voucher? (Y/N)         you conter? (Y/N)       Voucher? (Y/N)         ogs or Tadpoles Observed? (Y/N)       Voucher? (Y/N)         you conter? (Y/N)       Voucher? (Y/N)         provide the stream of the features of interest for site evaluation and a narrative description of the stream's location         you conter?       You conter?         you conter?       You conter?         you conter?		ise explain: USH Var TWAP 70-0 (1931)0. C
BIOTIC EVALUATION         rformed? (Y/N):	and tall of little	
BIOTIC EVALUATION         rformed? (Y/N):		
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): Include Important landmarks and other features of interest for site evaluation and a narrative description of the stream's location Brack and the features of interest for site evaluation and a narrative description of the stream's location Brack and the features of interest for site evaluation and a narrative description of the stream's location Brack and the features of interest for site evaluation and a narrative description of the stream's location Brack and the features of interest for site evaluation and a narrative description of the stream's location Brack and the features of interest for site evaluation and a narrative description of the stream's location Brack and the features of interest for site evaluation and a narrative description of the stream's location Brack and the features of interest for site evaluation and a narrative description of the stream's location Brack and the features of interest for site evaluation and a narrative description of the stream's location Brack and the stream's location and a narrative description of the stream's location Brack and the stream's location and a narrative description of the stream's location Brack and the stream's location and a narrative description of the stream's location and a narrative description and a narrative description and a narrative description	ID number. Include appropriate field data she	eels from the Primary Headwater Habitat Assessment Manual)
Include Important landmarks and other features of interest for site evaluation and a narrative description of the stream's location W W W W W W W W W W W W W W W W W W W	egs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic M	tacroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Include Important landmarks and other features of interest for site evaluation and a narrative description of the stream's location W W W W W W W W W W W W W W W W W W W	<u></u>	
Include Important landmarks and other features of interest for site evaluation and a narrative description of the stream's location W W W W W W W W W W W W W W W W W W W		
Include Important landmarks and other features of interest for site evaluation and a narrative description of the stream's location W W W W W W W W W W W W W W W W W W W	DRAWING AND NARRATIVE DESCRIPTION OF	E STREAM REACH (This must be completed):
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October 24, 2002 Revision

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Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) : 48

SITE NUMBER       GS-Q       RIVER BASIN       ORAINAGE AREA (mf)         LENGTH OF STREAM REACH (m)       100 Lm       LONG.       RIVER CODE       RIVER MILE         DATE       11/29/05       SCORER       K205('       COMMENTS         NOTE:       Complete Ail Items On This Form - Refer to "Field Evaluation Manual for Ohlo's PHWH Streams" for Instructions         STREAM CHANNEL       INONE / NATURAL CHANNEL       RECOVERED       Incover of the control
DATE 11/29/05 SCORER 40051       COMMENTS         NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohlo's PHWH Streams" for instructions         STREAM CHANNEL       NONE / NATURAL CHANNEL       RECOVERED       RECOVERING       RECENT OR NO RECOVERY         MODIFICATIONS:       photos 27-20         1.       SUBSTRATE (Estimate percent of every type of substrate present. Check ONL Y type predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         TYPE       BLDR SLABS (16 pts)       PERCENT       PERCENT         BOULDER (>256 mm) [16 pts]       Image: Clay or HARDPAN [0 pt]       Image: Clay or HARDPAN [0 pt]       Image: Clay or HARDPAN [0 pt]         BOULDER (<266 mm) [16 pts]
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohlo's PHWH Streams" for instructions         STREAM CHANNEL       INONE / NATURAL CHANNEL       RECOVERED       RECOVERING       RECENT OR NO RECOVERY         MODIFICATIONS:       Dhotes 27-28         1.       SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & 8.       HHEI         1.       SUBSTRATE (Estimate percent of every type of substrate types found (Max of 8). Final metric score is sum of boxes A & 8.       HHEI         1.       SUBSTRATE (Estimate percent of significant substrate types found (Max of 8). Final metric score is sum of boxes A & 8.       HHEI         1.       SUBSTRATE (Estimate percent of significant substrate types found (Max of 8). Final metric score is sum of boxes A & 8.       HHEI         1.       BOULDER (>256 mm) [16 pts]       Image: Sill T [3 pt]       Image: Sill T [3 pt]       Image: Sill T [3 pt]         1.       BOULDER (>256 mm) [12 pts]       Image: Sill T [3 pt]       Image: Sill T [3 pt]       Image: Sill T [3 pt]       Substrate         1.       GRAVEL (>264 mm) [9 pts]       Image: Sill T [3 pt]       Image: Sill T [3 pt]       Image: Sill T [3 pt]       Substrate         1.       Score OF TWO MOST PREDOMINATE SUBSTRATE TYPES:       Image: Sill T [3 pt]       Image:
STREAM CHANNEL       INONE / NATURAL CHANNEL       RECOVERING       RECOVERING       RECENT OR NO RECOVERY         MODIFICATIONS:
MODIFICATIONS:       photos 27-28         1.       SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decomposition of the present of every type of substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decomposition of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decomposition of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decomposition of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decomposition of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decomposition of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decomposition of significant substrate types for the maximum point of the present of the maximum point of the present form road culveris or storm water pipes form for the maximum point of the present form for the maximum point of the present for the maximum point of the present form for the present form for the present preses form for the maximum point culver
Photes       27-26         1.       SUBSTRATE (Estimate percent of every type of substrate present. Check O/LY two predominant substrate TYPE boxes (Max of 32). Add total number of significent substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decision of the state of substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decision of substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decision of substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decision of substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decision of substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decision of substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decision of substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decision of substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         Image: Decision of substrate types for the substrate types
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(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.       HHEI         TYPE       PERCENT       TYPE         BOULDER (>256 mm) [16 pts]       Image: Sill T [3 pt]       Image: Sill T [3 pt]         BOULDER (>256 mm) [16 pts]       Image: Sill T [3 pt]       Image: Sill T [3 pt]       Image: Sill T [3 pt]         BOULDER (>256 mm) [16 pts]       Image: Sill T [3 pt]         BOULDER (>256 mm) [12 pts]       Image: Sill T [3 pt]       Image: Sill T [3 pt]<
BLDR SLABS [16 pts]       Image: Sill T [3 pt]
BEDROCK [15 pt]       Image: Substrate of the subst
COBBLE (65-256 mm) [12 pts]       CLAY or HARDPAN [0 pt]       5         GRAVEL (2-64 mm) [9 pts]       0       CLAY or HARDPAN [0 pt]       5         SAND (<2 mm) [6 pts]
SAND (<2 mm) [6 pts]
Total of Percentages of Bidr Siabs, Boulder, Cobble, Bedrock       QO       (A) Q4       (B) Q4       (B) Q4       A+B         SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:       TOTAL NUMBER OF SUBSTRATE TYPES:       A+B         2.       Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes)       (Check ONL Y one box): > 5 cm - 10 cm [15 pts]       Pool Depth Max = 30         2.       > 30 centimeters [20 pts]       > 5 cm - 10 cm [15 pts]       O         > 10 - 22.5 cm [25 pts]       NO WATER OR MOIST CHANNEL [0 pts]       O
Bidr Stabs, Boulder, Cobble, Bedrock       Q4         SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:       TOTAL NUMBER OF SUBSTRATE TYPES:         2.       Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes}       (Check ONL Y one box):         > 30 centimeters [20 pts]       > 5 cm - 10 cm [15 pts]         > 22.5 - 30 cm [30 pts]       > 5 cm [5 pts]         > 10 - 22.5 cm [25 pts]       NO WATER OR MOIST CHANNEL [0 pts]
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:       TOTAL NUMBER OF SUBSTRATE TYPES:       Pool Depth         2.       Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes)       (Check ONL Y one box):       Pool Depth         > 30 centimeters (20 pts)       0       > 5 cm - 10 cm (16 pts)       Max = 30         > 22.5 - 30 cm [30 pts]       0       > 5 cm (5 pts)       O         > 10 - 22.5 cm [25 pts]       0       NO WATER OR MOIST CHANNEL 10 pts)       O
evaluation. Avoid plunge pools from road culverts or storm water pipes} (Check ONLY one box): > 30 centimeters (20 pts) > 22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]
> 30 centimeters [20 pts]       > 5 cm - 10 cm [15 pts]         > 22.5 - 30 cm [30 pts]       < 5 cm [5 pts]
□ > 10 - 22.5 cm [25 pts] □ NO WATER OR MOIST CHANNEL [0 pts]
□ > 4.0 meters (> 13') [30 pts] □ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] Width
□ / > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] □ ≤ 1.0 m (≤ 3' 3") [5 pts] Max=30 □ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY গেNOTE: River Left (L) and Right (R) as looking downstream分
RIPARIAN WIDTH FLOODPLAIN QUALITY
L R (Per Bank) L R (Most Predominant per Bank) L R V Wide >10m D D Mature Forest, Wetland D D Conservation Tillage
Moderale 5-10m MC Immature Forest, Shrub or Old Urban or Industrial
Important of field     Field     Field     Open Pasture, Row     Open Pasture, Row
Image: Comp to the second s
COMMENTS
<b>FLOW REGIME</b> (At Time of Evaluation) (Check ONLY one box): Stream Flowing
Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)
COMMENTS
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):
None $1.0$ $2.0$ $3.0$ $0.5$ $1.5$ $2.5$ $3.3$
STREAM GRADIENT ESTIMATE
Fiat (0.5 w100 ft)   Fiat to Moderate  Moderate (2 w100 ft)  Severe  Severe (10 w100 ft)

BS	-a
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DDITIONAL STREAM INFORMATION (This Information Must Also be Completed):	
QHEI PERFORMED? - 🗍 Yes 🗹 No QHEI Score (If Yes, Attach Completed QHEI Form)	
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Distance from Evaluated St	
CWH Name: Distance from Evaluated St EWH Name: Distance from Evaluated St	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE	
SGS Quadrangle Name: New Harren, WV-OH NRCS Soil Map Page: NRCS Soil Mar	Stream Order
ounty: Mugs Township/City: Letart Falle, C	this area
MISCELLANEOUS	
ase Flow Conditions? (Y/N): $Y$ Date of last precipitation: $11/22/05$ Quantity: unhore	- ww
hotograph information:(27+28)	
:levaled Turbidity? (Y/N): N Canopy (% open): 20	
/ere samples collected for water chemistry? (YN): N (Note lab sample no. or id. and atlach results) Lab Numbe	r:
ield Measures: Temp (*C) Dissolved Oxygen (mgA) pH (S.U.) Conductivity (umhosA	cm)
s the sampling reach representative of the stream (Y/N) $\sum$ If not, please explain:	
dditional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N):	
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Vo	ucher? (Y/N)
Comments Regarding Biology	
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be Include important landmarks and other features of interest for site evaluation and a narrative description of	
-LOW mut -	

class II

SILE NAME/LC	CATION AMP-OF					
	SITE NUMB	IER BS-2-2		SIN	DF	AINAGE AREA (mi²)
LENGTH OF S	TREAM REACH (ft)					
		co	MMENTS	<u> </u>		
NOTE: Con	nplete All Items On Thi	s Form - Refer t	o "Field Eve	luation Manual	for Ohio's PHV	VH Streams" for inst
STREAM CH		E / NATURAL CHA			RECOVERING [	DRECENT OR NO REC
MODIFICAT	IONS: BUR P.LAN	1- 33	An	1142-5	- 711	
	الما مان المحرب ويون معيا الأن الناب ويربين					
	TRATE (Estimate percent of 32). Add total number of 1					
TYPE		PERCENT	TYPE			PERCENT
ПО ві ØО ві	_DR SLABS [16 pts] DULDER (>256 mm) [16 pt	s) <u>35</u>		SILT [3 p() LEAF PACKAWO	ODY DEBRIS [3 p	ts]Û
ОО, ы	DROCK [16 pt]	20	00	FINE DETRITUS		
	DBBLE (65-256 mm) [12 pt	•		CLAY or HARDP	AN [0 pf]	10
	RAVEL (2-64 mm) <b>[9 pts]</b> AND (<2 mm) <b>[6 pts]</b>			MUCK [0 pts] ARTIFICIAL [3 p	ts)	
	Total of Passasianas of		(A)		-	(B)
Bidr S	labs, Boulder, Cobble, Bed NO MOST PREDOMINATE		23			5
				·····	WHER OF SUBST	
	num Pool Depth (Measure ation. Avoid plunge pools fo					each at the lime of
🔲 > 30 o	entimeters [20 pts]		0	> 5 cm - 10 cm		
	- 30 cm [30 pts] 22.5 cm [25 pts]		Ő	< 5 cm [6 pts] NO WATER OF	R MOIST CHANNE	L [0 pts]
COM	MENTS Ideal to	.:		MAXIMU	M POOL DEPTH	(centimeters):
	FULL WIDTH (Measured	as the average of				
> 4.0 n $    > 3.0 n$	neters (> 13') [30 pts] n - 4.0 m (> 9'7" - 13') [25 p	ots]	Ģ	> 1.0 m - 1.5 m ≤ 1.0 m (≤ 3' 3"	(> 3' 3" - 4' 8") [15  ) [5 pts]	pts]
🗍 > 1.5 n	n - 3.0 m (> 9' 7" - 4' 8") [20	pts]				
COM	MENTS	<u>_</u>		AVERAG	E BANKFULL W	DTH (meters)
	RIPARIAN ZONE AND F			<u>must</u> also be com OTE: River Left (L)		looking downstreamstr
	RIPARIAN WDTH	<u>FLOOD</u> L R	PLAIN QUALI			
ėć	(Per Bank) Wide >10m	ĠÔ	Mature Fore	minant per Bank) est, Wetland	ΰĎ	Conservation Tillage
00	Moderale 5-10m	00	Immature Fr Field	orest, Shrub or Old	00	Urban or Industrial
00	Narrow <5m	00		Park, New Field	00	Open Pasture, Row
		00	Fenced Pas			Crop Mining or Construction
	COMMENTS 3	C-14-1	ز~′			
	FLOW REGIME (At Time	e of Evaluation) (C	Check ONLY o			
-	Stream Flowing	ated pools (Injgrstili	ial)	_	Channel, isolated p annel, no-water (E	ools, no flow (Intermitten) phemeral)
8	aupouriave now with ISOIS		<u>.</u>			
	COMMENTS	1. J. J. A.				
0	COMMENTS	bends per 61 m (20	00 ft) of channe		'one bax):	<b>1</b> ,,
	COMMENTS	,	00 ft) of chann	el) (Check ONL Y 2.0 2.5	(one box): (	] 3.0 ] >3

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BS-2-2

QHEI PERFORMED? - LI Yes 🗠 No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	A
	Distance from Evaluated Stream
	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE E	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
SGS Quadrangle Name: New Haven, VV-01	H NRCS Soll Map Page: NRCS Soil Map Stream Order
ounty: Marga Tow	unship / City: Letart Falls, Ohio area
0 Miscellaneous	
ase Flow Conditions? (Y/N): Date of last precipitation:	11/29/05 Quentity: Untrom
holograph information: $\gamma_{g0} = H_{3} \gamma_{-}$	· · ·
levated Turbidity? (Y/N): Canopy (% open):O	
Vere samples collected for water chemistry? (Y/N): (Note I	lab sample no. or id. and attach results) Lab Number:
ield Measures: Temp (*C) Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity (µmhos/cm)
· · · · · · · · · · · · · · · · · · ·	ot, please explain:
	ot, piease explain:
ditional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	ther collections optional. NOTE: all voucher samples must be labeled with the si
	late sheets from the Primary Headwater Habitat Assessment Manual)
	s Observed? (Y/N) Voucher? (Y/N) uatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
omments Regarding Biology	

Include Important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

13 -12 .... R5-5 B5-FLOV 2 Ani woods

Class I

Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION _ APP - OH	<u> </u>	· · · · · · · · · · · · · · · · · · ·			
LENGTH OF STREAM REACH (ft)	AT	LONG RIVE	R CODE	RIVER MILE	- v 70.00
DATE 11/29/05 SCORER KOUSE					
NOTE: Complete All Items On This Form	- Refer to "Fiel	d Evaluation Manual for C	hio's PHW	H Streams" for Instru	uctions
STREAM CHANNEL DINONE / NATI MODIFICATIONS:	JRAL CHANNEL		VERING 🗍	RECENT OR NO RECO	VERY
1. SUBSTRATE (Estimate percent of ever (Max of 32). Add total number of significa					HHE
	•••	PE		PERCENT	Metri
00 BLOR SLABS [16 pts]		🔲 SiLT [3 pt]			Poin
BOULDER (>256 mm) [16 pts]					Substr
BEDROCK [16 pt]     BEDROCK [16 pt]     COBBLE (65-256 mm) [12 pts]		FINE DETRITUS (3 p)		80	Max =
		CLAY or HARDPAN [	r pij		
Image: Second control in the second control		ARTIFICIAL [3 pts]			118
Total of Percentages of Bidr Slabs, Bouider, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBST		15 TOTAL NUMBER			A+8
<ol> <li>Maximum Pool Depth (Measure the ma evaluation. Avoid plunge pools from road</li> </ol>	• •			ach at the time of	Pool De
<ul> <li>evaluation. Avoid plunge pools from road</li> <li>30 centimeters [20 pts]</li> </ul>	converts of storm v	vater pipes) (Check OvyLy or > 5 cm - 10 cm [15 pt			Max =
> 22.5 - 30 cm [30 pts]					0
[] > 10 - 22.5 cm [26 pts]		O NO WATER OR MOI	ST CHANNE	L [0 pts]	
COMMENTS Loss of Rain		MAXIMUM PO	OL DEPTH (	centimeters):	
3 BANK FULL WIDTH (Measured as the a			ONLY one b	ox):	Bankfu
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 15 m - 2.0 m (> 0' 7" - 13') [25 pts]		> 1.0 m → 1.5 m (> 3'3 ≤ 1.0 m (≤ 3'3") (5 pt	" - 4' 8") <b>(15 p</b> 1	ts]	Width
□ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		Co Σtronitzoolioph	e)		Max=3
					5
COMMENTS		AVERAGE BA	NKFULL WIC	OTH (meters)	
RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH	LAIN QUALITY		tight (R) as io	oking downstreams?	•
		Predominant per Bank)	ΰÔ	Conson + 5++ 7#	
	Inc	e Forest, Welland lure Forest, Shrub or Old		Conservation Tillage	
Moderate 5-10m	D Imma Field		00	Urban or industrial	
🗖 🗖 Narrow <5m	00 Resid	enlial, Park, New Field	00	Open Pasture, Row Crop	
	DD Fence	ed Pasture	00	Mining or Construction	
FLOW REGIME (At Time of Eval Stream Flowing Subsurface flow with isolated pool COMMENTS		_		ols, no flow (Intermitient) hemeral)	
SINUOSITY (Number of bends p	er 61 m (200 ft) of	channel) (Check ONLY one b	ox):		
None Q	1.0	2.0		3.0	
	1.5	. 2.5		>3	
1.)	1.4	· ····· <b>p</b>			
STREAM GRADIENT ESTIMATE	D Moderate (2			🗍 Severe (10 iu/10	

<u>BS-3</u>

DITIONAL STREAM INFORMATION (This Information Must Also be	
QHEI PERFORMED? - DYes WNo QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
) WWH Name:	
CWH Name:	
	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE	· ,
GS Quadrangle Name: <u>News Haven, UV-OH</u> NR	
ounty: <u>Meigh</u> Township	1011. Letart Falls, Ohio area
MISCELLANEOUS	
ase Flow Conditions? (Y/N): Date of last precipitation:11/6	19/05 Quantity: unknown
hotograph information:	
levated Turbidity? (Y/N): <u>N</u> Canopy (% open): <u>25%</u>	
lere samples collected for water chemistry? (Y/N): (Note lab sam	nple no. or id. and attach results) Lab Number:
gld Measures: Temp (*C) Dissolved Oxygen (mg/l)	_ pH (S.U.) Conductivity (µmhos/cm)
the sampling reach representative of the stream (Y/N) / If not, plea	se explain:
ish Observed? (Y/N) Voucher? (Y/N) Salamanders Obse	llections optional. NOTE: all voucher samples must be labeled with the si sets from the Primary Headwater Habitat Assessment Manual) rvert? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION erformed? (Y/N): (If Yes, Record all observations. Voucher col ID number. Include appropriate field data she isb Observed? (Y/N) Voucher? (Y/N) Salamanders Observed?	llections optional. NOTE: all voucher samples must be labeled with the si sets from the Primary Headwater Habitat Assessment Manual) rvert? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION erformed? (Y/N): (If Yes, Record all observations. Voucher col ID number. Include appropriate field data she	llections optional. NOTE: all voucher samples must be labeled with the si sets from the Primary Headwater Habitat Assessment Manual) rvert? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION erformed? (Y/N): (If Yes, Record all observations. Voucher col ID number. Include appropriate field data sho ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observeds of Tadpoles Observed? (Y/N) Aquatic M	llections optional. NOTE: all voucher samples must be labeled with the si sets from the Primary Headwater Habitat Assessment Manual) rvert? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION erformed? (Y/N): (If Yes, Record all observations. Voucher col ID number. Include appropriate field data sho ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Aquatic M	llections optional. NOTE: all voucher samples must be labeled with the si sets from the Primary Headwater Habitat Assessment Manual) rvert? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION erformed? (Y/N): (If Yes, Record all observations. Voucher col ID number. Include appropriate field data sho ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Aquatic M	lections optional. NOTE: all voucher samples must be labeled with the si sets from the Primary Headwater Habitat Assessment Manual) rved? (Y/N) Voucher? (Y/N) lacroinvertebrates Observed? (Y/N) Voucher? (Y/N) F STREAM REACH (This must be completed):
BIOTIC EVALUATION         erformed? (Y/N):       N	lections optional. NOTE: all voucher samples must be labeled with the si sets from the Primary Headwater Habitat Assessment Manual) rved? (Y/N) Voucher? (Y/N) lacroinvertebrates Observed? (Y/N) Voucher? (Y/N) F STREAM REACH (This must be completed):
BIOTIC EVALUATION  serformed? (Y/N):	lections optional. NOTE: all voucher samples must be labeled with the si sets from the Primary Headwater Habitat Assessment Manual) rved? (Y/N) Voucher? (Y/N) lacroinvertebrates Observed? (Y/N) Voucher? (Y/N) F STREAM REACH (This must be completed):
BIOTIC EVALUATION erformed? (Y/N):	Ilections optional. NOTE: all voucher samples must be labeled with the sile aets from the Primary Headwater Habitat Assessment Manuel) rved? (Y/N) Voucher? (Y/N) lacroinvertebrates Observed? (Y/N) Voucher? (Y/N) F STREAM REACH (This must be completed): te evaluation and a narrative description of the stream's location
BIOTIC EVALUATION erformed? (Y/N): (If Yes, Record all observations. Voucher col ID number. Include appropriate field data sho ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Aquatic M comments Regarding Biology: DRAWING AND NARRATIVE DESCRIPTION OF Include Important landmarks and other features of interest for sit Stricts Stricts Stricts (m P 2	Ilections optional. NOTE: all voucher samples must be labeled with the sile aets from the Primary Headwater Habitat Assessment Manuel) rved? (Y/N) Voucher? (Y/N) lacroinvertebrates Observed? (Y/N) Voucher? (Y/N) F STREAM REACH (This must be completed): te evaluation and a narrative description of the stream's location

class I

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Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) : 15

SITE NAME/LOCATION AMP-OH					
	S- Y RIVER BA	SIN	DRAI	NAGE AREA (mi <sup>2</sup> )	
LENGTH OF STREAM REACH (ft) _ 2 2					
DATE 11/21/05 SCORER Koss					
NOTE: Complete All Items On This Form					uctions
	DRAL CHANNEL DIE		ERING UP	CECENT OR NO RECU	VERY
MODIFICATIONS:					
1. SUBSTRATE (Estimate percent of ever	v type of substrate pre	sent. Check ONLY two or	adominant sub	strate TYPE boxes	
(Max of 32). Add total number of significa	nt substrate types found				HHEI
TYPE PE		SILT (3 pt)		PERCENT	Metric Points
BOULDER (>258 mm) [16 pts]	<u> </u>	LEAF PACK/WOODY D	EBRIS (3 pts)		
BEDROCK [16 pt]		FINE DETRITUS (3 pt	•	40	Substrate Max = 40
COBBLE (65-256 mm) [12 pts]		CLAY of HARDPAN [0	pt]	_40_	
GRAVEL (2-64 mm) [9 pts] G Ø SAND (<2 mm) [6 pts]	10 00	MUCK [0 pts] ARTIFICIAL [3 pts]		······································	10
Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock	0 14 6			(B) 4	A+B
SCORE OF TWO MOST PREDOMINATE SUBST	RATE TYPES:	TOTAL NUMBER	OF SUBSTRA	TE TYPES:	
2. Maximum Pool Depth (Measure the ma	ximum pool depth with	in the 61 meter (200 ft) e	valuation reac	th at the time of	Pool Depth
evaluation. Avoid plunge pools from road	cuiverts or storm water				Max = 30
↓ > 30 centimeters [20 pts] □ > 22.5 - 30 cm [30 pts]	B	> 5 cm - 10 cm [15 pt _ < 6 cm [5 pts]	6]		
> 10 - 22.5 cm [26 pts]	<u>B</u>	NO WATER OR MOIS	T CHANNEL	[0 pts]	$\Box$
COMMENTS Loss of the			L DEPTH (ce	ntimeters):	
3BANK FULL WIDTH (Measured as the	everage of 3.4 measure	ments) /Chack	ONI Yone bo	w)-	Bankfull
		> 1.0 m • 1.5 m (> 3' 3'	- 4' 8") [15 pts		Width
└ > 4.0 meters (> 13') [30 pts] → 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] → 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		≤ 1.0 m (≤ 3' 3") [5 pts	]		Max=30
					5
	<u> </u>	AVERAGE BAN	IKFULL WIDT	'H (meters)	
	This information				
RIPARIAN ZONE AND FLOODP		<u>must</u> also be completed ЮТЕ: River Left (L) and R	ight (R) as looi	king downstream បំ	
RIPARIAN WIDTH	FLOODPLAIN QUAL				
L R (Per Bank) Wide >10m		ominant per Bank) est, Wetland		Conservation Tillage	
Moderate 5-10m		orest, Shrub or Old	~~	Urban or Industrial	
	Field Residential	Dad. Mary Field	00 9	Open Pasture, Row	
UU Narrow <5m	~~	, Park, New Field		Crop	
	$\bigcup \bigcup Fenced Pa$			Mining or Construction	_
FLOW REGIME (At Time of Eval		-			
Stream Flowing	•	Moist Channe	l. isolated pool	is, no flow (Intermittent)	I
Subsurface flow with isolated pool COMMENTS	ls (Interstitial)	Dry channel, r	io water (Ephi	emeral)	
			· · · · · · · · · · · · · · · · · · ·	<del></del>	-
SINUOSITY (Number of bends p None	er 61 m (200 ft) of chanr 1.0	iel) (Check ONLY one bi	x):	3.0	
	15	1 2.5	ŏ	>3	
STREAM GRADIENT ESTIMATE		~			
Flat (0.5 N/100 h) Flat to Moderate	Moderate (2 /// 100 +	) Moderate to	Severe	Severe (10 iu)	00 A)

	(Il Yes, Attach Completed QHE! Form)
DOWNSTREAM DESIGNATED USE(S)	
	Distance from Evaluated Stream
J CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENT	IRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
SGS Quadrangle Name: New Kanen, WV - OH	NRCS Soil Map Page: NRCS Soil Map Stream Order
county: <u>Marga</u> Townsh	10/City: Letant Falls, Ohio area
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation:	1/29/05 Quantity untrom
Photograph Information:	
Elevated Turbidily? (Y/N): Canopy (% open):	2
Nere samples collected for water chemistry? (Y/N): (Note tab s	sample no. or id, and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/i)	pH (S.U.) Conductivity (µmhos/cm)
s the sampling reach representative of the stream (Y/N) $Y$ If not, p	Nasea avaisia.
a ne sembing reserve preserve or the streets (114	
ID number. Include appropriate field data Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Ob Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic	c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Performed? (Y/N): (If Yes, Record all observations. Voucher ID number, Include appropriate field data Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Ob Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic	sheets from the Primary Headwater Habitat Assessment Manual) pserved? (Y/N) Voucher? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Performed? (Y/N): (If Yes, Record all observations. Voucher ID number, Include appropriate field data Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Ob Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic	sheets from the Primary Headwater Habitat Assessment Manual) pserved? (Y/N) Voucher? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Performed? (Y/N): (If Yes, Record all observations. Voucher ID number, Include appropriate field data Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Ob Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic	sheets from the Primary Headwater Habitat Assessment Manual) pserved? (Y/N) Voucher? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Verformed? (Y/N):	sheets from the Primary Headwater Habitat Assessment Manual) pserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Performed? (Y/N): (If Yes, Record all observations. Voucher ID number, Include appropriate field data Tish Observed? (Y/N) Voucher? (Y/N) Salamanders Ob Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Comments Regarding Biology: DRAWING AND NARRATIVE DESCRIPTION	sheets from the Primary Headwater Habitat Assessment Manual) pserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed):
Performed? (Y/N): (If Yes, Record all observations. Voucher ID number, Include appropriate field data Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Ob Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Comments Regarding Biology: DRAWING AND NARRATIVE DESCRIPTION	sheets from the Primary Headwater Habitat Assessment Manual) pserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Performed? (Y/N): (If Yes, Record all observations. Voucher ID number, Include appropriate field data Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Ob Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Comments Regarding Biology: DRAWING AND NARRATIVE DESCRIPTION	sheets from the Primary Headwater Habitat Assessment Manual) pserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed):
Performed? (Y/N): (If Yes, Record all observations. Voucher ID number, Include appropriate field data Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Ob Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Comments Regarding Biology: DRAWING AND NARRATIVE DESCRIPTION Include important landmarks and other features of interest for	sheets from the Primary Headwater Habitat Assessment Manual) pserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed):
Performed? (Y/N):	sheets from the Primary Headwater Habitat Assessment Manual) pserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed):
Performed? (Y/N):	sheets from the Primary Headwater Habitat Assessment Manual) oserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed): site evaluation and a narrative description of the stream's location
Performed? (Y/N):	sheets from the Primary Headwater Habitat Assessment Manual) oserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed): site evaluation and a narrative description of the stream's location
Performed? (Y/N):	sheets from the Primary Headwater Habitat Assessment Manual) oserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed): site evaluation and a narrative description of the stream's location
Performed? (Y/N):	sheets from the Primary Headwater Habitat Assessment Manual) oserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed): site evaluation and a narrative description of the stream's location
Performed? (Y/N):	sheets from the Primary Headwater Habitat Assessment Manual) pserved? (Y/N) Voucher? (Y/N) voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) voucher? (Y/N) OF STREAM REACH (This must be completed): site evaluation and a narrative description of the stream's location
Performed? (Y/N): N (If Yes. Record all observations. Voucher ID number. Include appropriate field data Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Ob Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Comments Regarding Biology: DRAWING AND NARRATIVE DESCRIPTION Include important landmarks and other features of interest for	sheets from the Primary Headwater Habitat Assessment Manual) pserved? (Y/N) Voucher? (Y/N) voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) voucher? (Y/N) OF STREAM REACH (This must be completed): site evaluation and a narrative description of the stream's location
Performed? (Y/N):	sheets from the Primary Headwater Habitat Assessment Manual) oserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed): site evaluation and a narrative description of the stream's location

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### Primary Headwater Habitat Evaluation Form

		Cl	ass I
Primary H	eadwater Habitat Eva		19
		ore (sum of metrics 1, 2, 3) :	
SITE NAME/LOCATION AMP - ON SITE NUMBER			
LENGTH OF STREAM REACH (#) 50 - L	AT. LONG		
DATE 11/21/05 SCORER 16005-C	COMMENTS		
NOTE: Complete All Items On This Form			tructions
			COVERY
MODIFICATIONS: Scapt 355		14	
	huna of authority annout Charle OAH		
1. SUBSTRATE (Estimate percent of every (Max of 32). Add total number of significant			HHEI
<u>ТҮРЕ РЕІ</u> ВLDR SLABS (16 pts)	RCENT TYPE	PERCENT	Points
BOULDER (>256 mm) [16 pts]		DODY DEBRIS [3 pts]	Substrate
COBBLE (65-256 mm) [12 pts]			Max = 40
GRAVEL (2-64 mm) [9 pts]			14-
		pts]	
Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock	20 19	(8) 5	A+B
SCORE OF TWO MOST PREDOMINATE SUBSTR		MBER OF SUBSTRATE TYPES:	■
2. Maximum Pool Depth (Measure the max	• •	•	Pool Depth
evaluation. Avoid plunge pools from road o	🗍 🦳 > 5 cm - 10 cm	1 [15 pts]	Max = 30
	NO WATER C	R MOIST CHANNEL [0 pts]	
COMMENTS	MAXIM	JM POOL DEPTH (centimeters):	
3BANK FULL WIDTH (Measured as the a	verage of 3-4 measurements) (	Check ONLY one box):	Bankfuli
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7'' - 13') [25 pts]	L > 1.0 m - 1.5 m Substantiation (≤ 3*3	n (> 3' 3" - 4' 8") [15 pts] ") [5 pts]	Width <u>Max=30</u>
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	,		
COMMENTS	AVERA	GE BANKFULL WIDTH (meters)	5
	This Information must also be con	nistad	
	AIN QUALITY TYNOTE: River Left (L	) and Right (R) as looking downstreams	
EIPARIAN WIDTH	FLOODPLAIN QUALITY <u>L</u> R_ (Most Predominant per Bank)		
2 D Wide > 10m	Mature Forest, Wetland	Conservation Tillage	
D D Moderate 5-10m	Field		
D D Narrow <5m	Residential, Park, New Field	Crop	
COMMENTS	Fenced Pasture	Mining or Constructi	on 
FLOW REGIME (At Time of Evalu	alion) (Check ONLY one box):		
Stream Flowing Subsurface flow with isolated pools COMMENTS		Channel, isolated pools, no flow (Intermitte annel, no water (Ephemeral)	:nt>
SINUOSITY (Number of bends pe	r 61 m (200 ft) of channel) _(Check ONL	Y one box):	
P None D ☐ 0.5 D	1.0 <b>Q</b> 2.0 1.5 <b>Q</b> 2.5		
STREAM GRADIENT ESTIMATE	-/		
Flat (0.5 M100 ft) D Flat to Moderate	Moderate (2 livi loo li)	erate to Severe O Severe (10	10100 H)

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· · · · · · · · · · · · · · · · · · ·	53-5
DDITIONAL STREAM INFORMATION (This information Must Also be Co	mpleted):
	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	,
	Distance from Evaluated Stream
CWH Name:	
DEWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WA	ATERSHED AREA. CLEARLY MARK THE SITE LOCATION
ISGS Quadrangle Name: New Haven, WV-OH NRCS	Soil Map Page: NRCS Soil Map Stream Order
County: Megs Township / Ci	• • • • • • • • • • • • • • • • • • •
∂ MISCELLANEOUS	· · ·
tase Flow Conditions? (Y/N): $Y$ Date of last precipitation: $11/29$	10.5 Quantily: unknown
holograph Information: <u>yll</u> <del>IF33</del>	/
Elevated Turbidity? (Y/N): Canopy (% open): O	
Vere samples collected for water chemistry? (Y/N): N (Note lab sample	
	3
leid Measures: Temp (*C) Dissolved Oxygen (mg/l) [	pH (S.U.) Conductivity (µmhos/cm)
s the sampling reach representative of the stream (Y/N) If not, please	explain:
difficient commente/deposition of collution immenter	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): V (IFYes, Record all observations. Voucher collect	
	iions optional. NOTE: all voucher samples must be labeled with the site i from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Salamanders Observed	
rogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macr	reinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

#### DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

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Include Important landmarks and other features of Interest for site evaluation and a narrative description of the stream's location

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## Primary Headwater Habitat Evaluation Form

Class I

Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :	11
SITE NAME/LOCATION AMP-OH	
SITE NUMBER BS- G RIVER BASIN DRAINAGE AREA (mi <sup>2</sup> )	
LENGTH OF STREAM REACH (R) LAT LONG RIVER CODE RIVER MIL	
LENGTH OF STREAM REACH (R) LAT. LONG. RIVER CODE RIVER MILL DATE SCORER MOL COMMENTS INFORMATION	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for It	nstructions
STREAM CHANNEL ON NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO F	ECOVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxe	
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI
TYPE         PERCENT         TYPE         PERCENT           U         BLOR SLABS [16 pts]         U         SiLT [3 pt]         U         U	Metric Points
BOULDER (>256 mm) [16 pts]     LEAF PACK/WOODY DEBRIS [3 pts]	Substrate
Image: SedRock [16 pt]         Image: SedRock [16 pt]<	Max = 40
GRAVEL (2-64 mm) (9 pts)     G     G     G     G     G     MUCK (0 pts) <u>36</u>	
SAND (<2 mm) [6 pts]	
Total of Percentages of (A) Bidr Slabs, Boulder, Cobble, Bedrock (A) 3	A+B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:	L
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Depth
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] - 5 cm - 10 cm [15 pts]	Max = 30
□ > 22.5 - 30 cm (30 pts) □< 5 cm (5 pts)	
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	
COMMENTS Very Stre, NO PUUS MAXIMUM POOL DEPTH (continueters):	·····
BANK FULL WIDTH (Measured as the average of 3-4 measurements)     (Check ONLY one box):     > 4.0 meters (> 13') [30 pts]     > 1.0 m - 1.5 m (> 3' 3" - 4' 6") [15 pts]	Bankfull Width
□ > 3.0 m - 4.0 m (> 9' 7" - 13") [25 pts] ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	Max=30
□ > 1.5 m - 3.0 m (> 9' 7" - 4" 8") [20 pts]	5
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY WONTE: River Left (L) and Right (R) as looking downstreams	r
RIPARIAN WIDTH FLOODPLAIN QUALITY L_R_ (Most Predominant per Bank) L_R_	
XIZ, Wide >10m ATX Mature Forest, Wetland D Conservation Tillag	e
Field	
Narrow <5m     Residential, Park, New Field     Open Pasture, Rov     Crop	1
COMMENTS COMMENTS Construct Construct	tion
FLOW REGIME (At Time of Evaluation)       (Check ONLY one box):         Stream Flowing       Stream Flowing         Subsurface flow with isolated pools (Interstitial)       Dry channel, isolated pools (Ephemeral)         COMMENTS       Official (At Time of Evaluation)	lent)
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	
STREAM GRADIENT ESTIMATE	
□ Flat (0.5 // 100 m)     □ Flat to Moderate     □ Moderate (2 // 100 m)     □ Moderate to Severe	0 N/100 A)

## BS-6

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. /	Completed):
	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
] WWH Name:	
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIR	
ISGS Quadrangle Name: New Haven, WU-OH N	RCS Soli Map Page: NRCS Soli Map Stream Order
county: Township	roin Letart Falls, Ohio area
MISCELLANEOUS	
ase Flow Conditions? (Y/N): Z Date of last precipitation: 1118	9135 Quantity: untrearm
holograph Information:	
levated Turbidity? (Y/N): N Canopy (% open): 25	
Vere samples collected for water chemistry? (Y/N): $N$ (Note lab sa	
х. <i>У</i>	pH (S.U.) Conductivity (µmhos/cm)
s the sampling reach representative of the stream (Y/N) If not, ple	ase explain:
Additional comments/description of pollution impacts: <u>56vevely</u>	product banks
	offections optional. NOTE: all voucher samples must be labeled with the site neets from the Primary Headwater Habitat Assessment Manual) erved? (Y/N) Voucher? (Y/N) Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
DRAWING AND NARRATIVE DESCRIPTION O	F STREAM REACH (This must be completed):
	DF STREAM REACH (This <u>must</u> be completed): ite evaluation and a narrative description of the stream's location
Include important landmarks and other features of Interest for s	ite evaluation and a narrative description of the stream's location
Include important landmarks and other features of Interest for s	ite evaluation and a narrative description of the stream's location
Include important landmarks and other features of Interest for s	ite evaluation and a narrative description of the stream's location
	ite evaluation and a narrative description of the stream's location
Include important landmarks and other features of Interest for s	ite evaluation and a narrative description of the stream's location
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Include important landmarks and other features of Interest for s	ite evaluation and a narrative description of the stream's location
Include important landmarks and other features of Interest for s	ite evaluation and a narrative description of the stream's location
Include important landmarks and other features of Interest for s	ite evaluation and a narrative description of the stream's location

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PHWH Form Page - 2

Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :

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Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) : 16	
SITE NAME/LOCATIONAN - ONSITE NUMBER BS RIVER BASIN DRAINAGE AREA (m <sup>2</sup> )	
LENGTH OF STREAM REACH (R) LAT LONG RIVER CODE RIVER MILE DATE	lions
STREAM CHANNEL ONONE / NATURAL CHANNEL OR RECOVERED RECOVERING OR RECENT OR NO RECOVER MODIFICATIONS:	:RY
TYPE PERCENT TYPE PERCENT N	HHEI Metric Point
BOULDER (>256 mm) [16 pts]         Image: Control of the state o	iubstral <u>Max = 4</u>
SAND (<2 mm) [6 pts]	ю А+В
<ul> <li>Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</li> <li>&gt; 30 centimeters [20 pts]</li> <li>&gt; 22.5 - 30 cm [30 pts]</li> <li>&gt; 10 - 22.5 cm [25 pts]</li> <li>NO WATER OR MOIST CHANNEL [0 pts]</li> </ul>	bol Dep Max = 34 5
COMMENTS moist charas after 5204 MAXIMUM POOL DEPTH (continuetors):	
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Bankfuli Width <u>Max=30</u>
This Information <u>must</u> also be completed RIPARIAN 20NE AND FLOODPLAIN QUALITY 과 아이폰: River Left (L) and Right (R) as looking downstream와 <u>RIPARIAN WIDTH FLOODPLAIN QUALITY</u>	
L R       (Most Predominant per Bank)       L R         Vide >10m       Image       Image         Moderate 5-10m       Image       Image         Hoderate 5-10m       Image       Image	
Narrow <5m	
FLOW REGIME (At Time of Evaluation)       (Check ONLY one-box)         Stream Flowing       Moist Channel, isolated pools, no flow (Intermittent)         Subsurface flow with isolated pools (Interstitial)       Dry channel, no water (Ephemeral)         COMMENTS       Comments	
SINUOSITY (Number of bends per 61 m (200 ft) of channel)         (Check ONL Y one box):           None         1.0         2.0         3.0           0.5         1.5         2.5         3	
STREAM GRADIENT ESTIMATE Stream GRADIENT ESTIMATE Stream Gradiente (2 1/100 /l) OModerate to Severe (10 /l/100 /l)	I

PHWH Form Page - 1

### BS-8

CHELPERFORMED? - DYES THAN OHF	# Score (If Yes, Atlach Completed QHEI Form)
	(I TBS, PRACE CONFIDENCE CITED TO THE
DOWNSTREAM DESIGNATED USE(S) 7 WWH Name:	Distance from Evaluated Stream
J CWH Name:	Distance from Evaluated Stream
	Distance from Evaluated Stream
	JDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
SGS Quadrangle Name: New Haven, 4	V - OH NRCS Soil Map Page: NRCS Soil Map Stream Order
ounty: Min 3	Township/ City: Letart Falls, ohio nea
MISCELLANEOUS	· · · ·
ase Flow Conditions? (Y/N): Date of last pred	sipitation: 11/29/05 Quantity: unknown
hotograph information: YLC #39	
levated Turbidity? (Y/N): N Ganopy (% op	hen):
	(Note lab sample no. or id. and attach results) Lab Number:
ield Measures: Temp ('C) Dissolved Oxyge	en (mg/l) pH (S.U.) Conductivity (µmhos/cm)
the sampling reach representative of the stream (Y/N)	If not, please explain:
BIOTIC EVALUATION	
ID number. Include appro ish Observed? (Y/N) Voucher? (Y/N) S rogs of Tadpoles Observed? (Y/N) Voucher? (Y/	opriate field data sheets from the Primary Headwater Habitat Assessment Manual) Salamanders Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
ID number. Include appro Fish Observed? (Y/N) Voucher? (Y/N) S Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/	opriate field data sheets from the Primary Headwater Habitat Assessment Manual) Salamanders Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
ID number. Include appro Sish Observed? (Y/N) Voucher? (Y/N) S Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/ Comments Regarding Biology:	pprizte field data sheets from the Primary Headwater Habilat Assessment Manual) Satamanders Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
ID number. Include appro Fish Observed? (Y/N) Voucher? (Y/N) S Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/ Comments Regarding Biology: DRAWING AND NARRATIVE DES	Salamanders Observed? (Y/N) Voucher? (Y/N) N) Aqualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
ID number. Include appro Fish Observed? (Y/N) Voucher? (Y/N) S Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/ Comments Regarding Biology: DRAWING AND NARRATIVE DES	Salamanders Observed? (Y/N) Voucher? (Y/N) N) Aqualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Scription of Stream REACH (This <u>must</u> be completed):
ID number. Include appro Fish Observed? (Y/N) Voucher? (Y/N) S Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/ Comments Regarding Biology: DRAWING AND NARRATIVE DES Include Important landmarks and other features	salamanders Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) N) Aqualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/M) SCRIPTION OF STREAM REACH (This <u>must</u> be completed): a of interest for site evaluation and a narrative description of the stream's location Hin Shut
ID number. Include appro Sish Observed? (Y/N) Voucher? (Y/N) S Frogs of Tadpoles Observed? (Y/N) Voucher? (Y/ Comments Regarding Biology: DRAWING AND NARRATIVE DES Include Important landmarks and other features Bolt Ippint/	Salamanders Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Scription of Stream REACH (This <u>must</u> be completed): s of interest for site evaluation and a narrative description of the stream's location
ID number. Include appro ish Observed? (Y/N) Voucher? (Y/N) S rogs of Tadpoles Observed? (Y/N) Voucher? (Y/ comments Regarding Biology: DRAWING AND NARRATIVE DES Include Important landmarks and other features Bolt Ippint/	ppriate field data sheets from the Primary Headwater Habilat Assessment Manual) Salamanders Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Voucher? (Y/N) SCRIPTION OF STREAM REACH (This <u>must be completed)</u> : s of interest for site evaluation and a narrative description of the stream's location the stream's location the stream's location

# Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :

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Primary He	adwater Habitat Evaluat HHEI Score (su	ion Form m of metrics 1, 2, 3) :
SITE NAME/LOCATION A MP-OH		
SITE NUMBER_KS	9RIVER BASIN	DRAINAGE AREA (mi²)
LENGTH OF STREAM REACH (II) LAT DATE 11/29/05 SCORER MBL	COMMENTS NECTION	
NOTE: Complete All Items On This Form - I		
MODIFICATIONS:		••
1. SUBSTRATE (Estimate percent of every to	ype of substrate present. Check ONLY two prec	onvinant substrate TYPE boyes
(Max of 32). Add total number of significant a	substrate types found (Max of B). Final metric sco	re is sum of boxes A & B. HHE
TYPE         PERC           Image: Display state         BLDR SLABS [16 pts]		73 Point
BOULDER (>256 mm) [16 pts]	D.X LEAF PACKWOODY DE	Substra
COBBLE (65-256 mm) [12 pts]		
GRAVEL (2-84 mm) [9 pts]     SAND (<2 mm) [6 pts]	[] [] MUCK [0 pts] [] [] ARTIFICIAL [3 pts]	
Total of Percentages of		(B) A+B
Bidr Slabs, Boulder, Cobble, Bedrock	ATE TYPES: TOTAL NUMBER O	F SUBSTRATE TYPES:
	mum pool depth within the 61 meter (200 ft) ev	
evaluation. Avoid plunge pools from road cu 30 centimeters [20 pts]	<pre>ilverts or storm water pipes) (Check ONLY one</pre>	
> 22.5 · 30 cm [30 pts] > 10 - 22.5 cm [25 pts]	S cm [\$ pts] NO WATER OR MOIST	
	MAXIMUM POOL	. DEPTH (centimeters):
	erage of 3-4 measurements) (Check O	NLV one box): Bankfu
3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		Max=30
	AVERAGE BANK	
RIPARIAN ZONE AND FLOODPLA	This information <u>must</u> also be completed	hl (R) as looking downstreams
<b>RIPARIAN WIDTH</b>	FLOODPLAIN QUALITY	
	Mature Forest, Wetland	Conservation Tillage
D Moderate 5-10m	Field	Urban or Industrial
	C C Residential, Park, New Field	Open Pasture, Row Crop
COMMENTS		Mining or Construction
FLOW REGIME (At Time of Evaluat Stream Flowing Subsurface flow with isolated pools ( COMMENTS	Moist Channel,	isolated pools, no flow (Intermittent) water (Ephemeral)
	61 m (200 ft) of channel) (Check ONLY one box	): 3.0
	1.5 1.7 2.5	☐ ×3
STREAM GRADIENT ESTIMATE	Moderate (21/100 II)	
Flat (0.5 h/100 h)	Moderate (21/100 II) Diderate to S	evere Severe (10 tv 100 tr)

### <u>BS-9</u>

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ADDITIONAL STREAM INFORMATION (This information Must Also be Completed)	
QHEI PERFORMED? - O Yes KNo QHEI Score (II Yes, Al	ttach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:      CWH Name:	
D EWH Name:	Distance from Evaluated Stream
<b>MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE <u>ENTIRE</u> WATERSHE</b>	ID AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangia Name: New Howen, WV-ON NRCS Soll Map	o Page: NRCS Soil Map Stream Order
County: Nelgs Township / City:	tart Julle, Ohio area
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation:)	quantity: unknown
Photograph Information: yes # 40	
Elevated Turbidity? (Y/N): Canopy (% open):	
Were samples collected for water chemistry? (Y/N): (Note tab sample no. or id	I. and attach results) Lab Number:
Field Measures: Temp ("C) Dissolved Oxygen (mg/l) pH (S.U.)	
Is the sampling reach representative of the stream (YAN) $\frac{1}{1}$ If not, please explain:	
entire length (~80ft) in surry and	•
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	· · · · · · · · · · · · · · · · · · ·
Performed? (Y/N): (II Yes, Record all observations. Voucher collections option ID number. Include appropriate field data sheets from the	nal. NOTE: all voucher samples must be labeled with the site Brimony Mandarator Habitat Assessment Manuali
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N)	
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinverteb	
Comments Regarding Biology:	
DRAWING AND NARRATIVE DESCRIPTION OF STREAD	
Include important landmarks and other features of interest for site evaluation	and a narrative description of the stream's location
2 20	
They may	X
FLOW	a l
	June -
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PHWH Form Page - 2	

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PHWH Form Page - 2

Class II

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Severe (10 m/100 m)

Primary I	Headw	ater Habitat Evalu HHEI Score			54
SITE NAME/LOCATION AMP - OH					
		RIVER BASIN	DR/		
LENGTH OF STREAM REACH (f) 200 DATE 11/29/05 SCORER 15000	LAT	LONG RI		RIVER MILE	
NOTE: Complete All Items On This For					uctions
		NNEL PRECOVERED DRE			DVERY
BLDR SLABS [16 pts]     BOULDER (>256 mm) [16 pts]     BOULDER (>256 mm) [16 pts]     BEDROCK [16 pt]		Types found (Max of 8). Final metric         TYPE         SILT [3 pt]         LEAF PACKWOOD         FINE DETRITUS [3         CLAY or HARDPAN	ic score is sum o DY DEBRIS [3 pt 3 pts]	f boxes A & B. PERCENT	HHEI Metric Points Substrate Max = 40
Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBS	30	(A)	ER OF SUBSTR	(B) 4	19 A+B
<ul> <li>Maximum Pool Depth (Measure the metabulation. Avoid plunge pools from roa</li> <li>&gt; 30 centimeters [20 pts]</li> <li>&gt; 22.5 - 30 cm (30 pts)</li> <li>&gt; 10 - 22.5 cm (25 pts)</li> </ul>	•	•	Y one box): 5 pts]	. [0 pts]	Pool Depth Max = 30
COMMENTS		MAXIMUM	POOL DEPTH (c	entimeters): 15	
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.6 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	average of	3-4 measurements) (Cha ☐ > 1.0 m - 1.5 m (> ☐ ≤ 1.0 m (≤ 3'3") [5			Bankfull Width Max=30
COMMENTS		AVERAGE	BANKFULL WIC	TH (meters)	29
RIPARIAN ZONE AND FLOOD RIPARIAN WIDTH	PLAIN QUAL	information <u>must</u> also be comple ITY \$2NOTE: River Left (L) an 2LAIN QUALITY		oking downstreams?	
L R (Per Bank)		(Most Predominant per Bank) Mature Forest, Wetland		Conservation Tillage	
DDY Moderate 5-10m	বের	Immature Forest, Shrub or Old Field	00	Urban or Industrial	
O O Narrow <5m	οd	Residential, Park, New Field		Open Pasture, Row Crop	
COMMENTS		Fenced Pasture	00	Mining or Construction	-
FLOW REGIME (At Time of Ev. Stream Flowing     Subsurface flow with isolated po COMMENTS		🔟 Moist Cha	nnel, isolated po iel, no water (Ep	ols, no flow (intermittent) hemeral)	

<u> </u>	
1	
<b>N</b>	

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Fiat (0.5 w 100 h)

October 24, 2002 Revision

None 0.5

STREAM GRADIENT ESTIMATE at (0.5 kr/100 kr) D Flat to Moderate

1

PHWH Form Page - 1

2.0 2.5

Moderate to Severe

 SINUOSITY (Number of bends per 61 m (200 ft) of channel)
 (Check ONLY one box):

 None
 1.0
 2.0

 0.5
 1.5
 2.5

D Moderate (2 IV100 II)

1.0 1.5

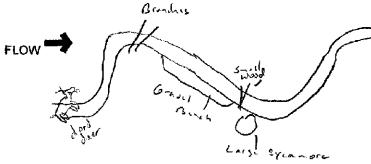
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ADDITIONAL STREAM INFORMATION (This Infor	rmation lifust Aiso be Completed):
	QHEI Score (if Yes, Attach Completed QHE) Form)
DOWNSTREAM DESIGNATED USE(S)	
	Distance from Evaluated Stream
	Distance from Evaluated Stream
] EWH Name:	Distance from Evaluated Stream
ISGS Quadrangle Name: <u>New Haven</u> ,	NCLUDING THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
county:	Township / City: Letart Falls, Ohio area
MISCELLANEOUS	
	t precipitation: 11/24/05 Quantity: unbinom
hotograph Information:	·
levaled Turbidity? (Y/N): Canopy (	% open): <u>(5<sup>0</sup>/b</u>
Vere samples collected for water chemistry? (Y/N):	(Note tab sample no. or id. and attach results) Lab Number:
	Oxygen (mg/l) pH (S.U.) Conductivity (umhos/cm) (Y/N) If not, please explain:
dditional comments/description of pollution impacts	ls:
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all ob ID number, Include a	bservations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher	Satamanders Observed? (Y/N)Voucher? (Y/N) ? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
DRAWING AND NARRATIVE	DESCRIPTION OF STREAM REACH (This <u>must</u> be completed):
Include important landmarks and other lease	stures of interest for site evaluation and a narrative description of the stream's location
······	
Branches	
	(-
	Sides



Class III

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Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :

TYPE       BLDR SLABS (16 pta)       FERCENT       TYPE       SILT (3 pt)       FERCENT         BOULDER (256 mm) (16 pts)			Dre (sum of metrics 1, 2, 3) :	55
LENGTH OF STREAM REACH (N) / CO_ LAT. LONG. RIVER CODE RIVER MILE				
DATE       112121203       SCORER       COMMENTS         NOTE:       Comments       Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruction         STREAM CHANNEL       Image: Comments       Image: Comments       Image: Comments       Image: Comments         SUBSTRATE       Estimate percent of every type of substrate present. Check ONLY type percentions       Image: Comments       Image: Comments <tdimage: comments<="" td=""> <tdimage: comments<="" td=""></tdimage:></tdimage:>				
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruction STREAM CHANNEL         STREAM CHANNEL       INONE / NATURAL CHANNEL       RECOVERED       RECOVERING       RECOVERING       RECENT OR NO RECOVER MODIFICATIONS:         1.       SUBSTRATE (Estimate percent of every type of aubstrate present. Check OVIL Y type percentinant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & 8.       Final metric score is sum of boxes A & 8.         YPE       BLOR SLABS (16 pts)       PERCENT       PERCENT       PERCENT         BLOR SLABS (16 pts)       PERCENT       PERCENT       PERCENT         BCOULDER (256 mm) (15 pts)       CLAY or HARDPAN (8 pts)       PERCENT         COBBLE (65:265 nm) (12 pts)       CLAY or HARDPAN (8 pts)       PERCENT         COBBLE (65:265 nm) (12 pts)       CLAY or HARDPAN (8 pts)       PERCENT         SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:       TOTAL NUMBER OF SUBSTRATE TYPES:       Stantimeter (20 pts)       Stantianter (20 pts)         2.       Maximum Pool Depth (Massure de maximum pool depth within the 51 meter (200 f) evaluation reach at the time of evaluation. Avoid ptimge pools from read cubrits or stom was profes)       COEM ONIST CHANNEL [9 pts]       Stantianter (23 3) [9 pts]       Stantianter (23 3) [9 pts]       Stantianter (23 3) [9 pts]       Stantion (13 3) [9 pts]       Stantianter (13 3) [9 pts]				
STREAM CHANNEL       INONE / MATURAL CHANNEL       RECOVERED       RECOVERING       RECOVENDING       RECOVENDING				
MODIFICATIONS:  SUBSTRATE (Estimate percent of every type of substrate present. Check OVI, / Yog predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.  TYPE SUCR SLASS [16 pts] EERCENT				
(Max of 32). Add total number of significant solatiste types found (Max of 8). Final metric score is sum of boxes A 8.         Image: State of the state of		URAL CHANNEL CRECOVERED		OVERY
TYPE       BLDR SLABS [16 pts]       PERCENT       TYPE       SULT [3 pt]       PERCENT       PERCENT         BOULDER (=256 mm) [16 pts]       BLDR SLABS [16 pts]       Scon 10 cm [15 pts]       Scon [15 pts]       Scon [15 pts]       Scon [15 p				HHEI
BOULDER (>250 mm) [15 pts]       IDA PARAWOODY DEBRIS [3 pts]         BOULDER (>250 mm) [12 pts]       IDA PARAWOODY DEBRIS [3 pts]         COBBLE (65-266 mm) [12 pts]       IDA PARAPAN [0 pt]         GRAVEL (24 mm) [15 pts]       IDA PARAPAN [0 pt]         BOULDER (>526 mm) [12 pts]       IDA PARAPAN [0 pt]         BOULDER (>526 mm) [12 pts]       IDA PARAPAN [0 pt]         GRAVEL (24 mm) [15 pts]       IDA PARAPAN [0 pt]         BOULDER (>526 mm) [12 pts]       IDA PARAPAN [0 pt]         BOULDER (>526 mm) [12 pts]       IDA PARAPAN [0 pt]         Stab. Boulder, Coble. Bedrock, IDA S       (A)         Stab. Stab. Boulder, Coble. Bedrock, IDA S       (A)         Stab. Boulder, Coble. Bedrock, IDA S       (Check ONLY one box):         Stab. Dollar, IDA S       (A) <td>TYPE PE</td> <td>ERCENT TYPE</td> <td></td> <td>Metric</td>	TYPE PE	ERCENT TYPE		Metric
BEDROCK [16 pt]       FINE DETRITUS [3 pts]         COBBLE [65:266 mm] [12 pts]       Image: Class of HARDPAN [0 pt]         GRAVEL (2-4 mm) [16 pts]       Image: Class of HARDPAN [0 pt]         SAND (-2 mm) [16 pts]       Image: Class of HARDPAN [0 pt]         BUT Slabs, Boulder, Cabble, Bedrock       Image: Class of HARDPAN [0 pt]         SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:       Image: Class of HARDPAN [0 pt]         2.       Maximum Pool Depth (Measure the maximum pool depth within the 51 meter (200 ft) evaluation reach at the time of evaluation Avoid plunge pools from road culverts or storm water profes)       (Check ONL Y one box):         > 30 centimeters [20 pts]       Image: Score of Two [15 pts]       Image: Score of Two [15 pts]         > 25 der. 10 or [15 pts]       Image: Score of Two [15 pts]       Image: Score [15 pts]         > 25 der. 10 or [15 pts]       Image: Score [15 pts]       Image: Score [15 pts]         > 30 ensister (13) [20 pts]       Image: Score [15 pts]       Image: Score [15 pts]         > 40 on (-9'7 - 13) [26 pts]       Image: Score [15 pts]       Image: Score [15 pts]         > 40 on (-9'7' - 4'9') [20 pts]       Image: Score [15 pts]       Image: Score [16 pts]         > 40 on (-9'7' - 13) [26 pts]       Image: Score [16 pts]       Image: Score [16 pts]         > 40 on (-9'7' - 13) [26 pts]       Image: Score [16 pts]       Image: Score [16 pts]      <			DODY DEBRIS 13 pts1	Points
COBBLE (65-25 mm) [12 pts]       2         GRAVEL (2-64 mm) [15 pts]       2         MUCK (10 pts]       MUCK (10 pts]         SAND (-2 mm) [5 pts]       0         Bitr Slabs. Boulder. Cabble. Bedrock.       2.5         SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:       TOTAL NUMBER OF SUBSTRATE TYPES:         Maximum Pool Depth (Measure the maximum pool depth within the 51 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pfles)       (Check ONL Y one box):         > 30 centimeters (20 pts]       > 5 cm - 10 cm (15 pts]       > 5 cm - 10 cm (15 pts]         > 2.2. So m (25 pts)       0 mode of pts]       > 5 cm - 10 cm (15 pts]         > 2.3.0 om (30 pts]       0 mode of pts]       > 5 cm - 10 cm (15 pts]         > 2.2.5 cm (25 pts)       0 mode of pts]       0 mode of pts]         COMMENTS       MAXIMUM POOL DEPTH (centimeters):       1.5         3.       BANK FULL WIDTH (Measured as the average of 3-4 measurements)       (Check ONL Y one box):         > 4.0 meters (+ 13) [30 pts]       > 10 m - 1.5 m (+ 33 * 4 #) [15 pts]       > 10 m + 1.5 m (+ 33 * 5 #) [15 pts]         > 3.0 m (+ 97 * -14 *) [20 pts]       1 modult TY       AVERAGE BANKFULL WIDTH (meters)         COMMENTS       AVERAGE BANKFULL WIDTH (meters)       1 mode of conservation Tillage         Note come       1 mof	BEDROCK [16 pt]		S [3 pts]	Substrate Max = 40
SAND (<2 mm) [6 pts]	COBBLE (65-256 mm) [12 pts]		PAN [0 pt]	
Total of Percentages of Bidr Stabs. Boulder, Cobble. Bedrock       A       (a)       (b)         SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:       TOTAL NUMBER OF SUBSTRATE TYPES:       (b)         2.       Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation meach at the time of evaluation. Avoid plunge pools from road culvets or storm water propes)       (Check ONLY one box):       > 30 centimeters [20 pts]       > 5 cm - 10 cm [15 pts]         > 22.5 cm [25 pts]       > 22.5 cm [25 pts]       > 5 cm - 10 cm [15 pts]       < 5 cm [5 pts]			pts]	25
Bidr Stabs. Boulder. Cobble. Bedrock.       Image: Comparison of the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water prices).       TOTAL NUMBER OF SUBSTRATE TYPES:       Image: Comparison reach at the time of evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water prices).       Comparison reach at the time of evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water prices).       Comparison reach at the time of evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water prices).       So continue to the time of evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water prices).       So continue to the time of evaluation reach at the time of evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water prices).         > 30 centimeters [20 pts]       > 5 cm (15 pts)       So cm [15 pts]       So cm [15 pts]         > 22.5 - 30 cm [30 pts]				A+B
evaluation. Avoid plunge pools from road culverts or storm water pifes)       (Check ONLY one box):         > 30 centimeters [20 pts]       > 5 cm -10 cm [16 pts]         > 25 cm -10 cm [16 pts]       < 5 cm (5 pts]	Bidr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBST			
> 30 centimeters [20 pts]       > 5 cm - 10 cm [15 pts]         > 22.5 - 30 cm [30 pts]       > 5 cm (5 pts]         > 10 - 22.5 cm [25 pts]       NO WATER OR MOIST CHANNEL [0 pts]         COMMENTS				Pool Dept
> 10 - 22.5 cm [25 pts]       INO WATER OR MOIST CHANNEL [9 pts]       [15]         COMMENTS       MAXIMUM POOL DEPTH (centimeters):       [15]         3.       BANK FULL WIDTH (Measured as the average of 3-4 measurements)       (Check OALY one box):       [15]         > 4.0 meters (> 13) [30 pts]       [15]       > 1.0 m - 1.5 m (> 3' 3' - 4' 8') [15 pts]       [15]         > 3.0 m - 4.0 m (> 9' 7' - 4' 8') [20 pts]       [15]       > 1.0 m (\$ 3' 3') [5 pts]       [16]         > 1.5 m - 3.0 m (> 9' 7' - 4' 8') [20 pts]       [16]       x VERAGE BANKFULL WIDTH (meters)       [16]         This information must also be completed         RIPARIAN ZONE AND FLOODPLAIN QUALITY         This information must also be completed       Ripharkian WaDTH       FLOODPLAIN QUALITY       x NOTE: River Left (L) and Right (R) as looking downstream\$         RIPARIAN ZONE AND FLOODPLAIN QUALITY       x NOTE: River Left (L) and Right (R) as looking downstream\$       [16]         Wide >10m       [17]       Mature Forest, Wetland       [18]       [18]         [18]       [19]       [19]       [11]       [11]         [18]       [16]       [16]       [16]       [16]         [19]       [16]       [16]       [16]       [16]       [16]         [19]       [16]       [16]		> 5 cm - 10 cm	n (15 pts)	Max = 30
CONMENTS       MAXIMUM POOL DEPTH (centimeters):       [/5]         3.       BANK FULL WIDTH (Measured as the average of 3-4 measurements)       (Check ONLY one box):         > 4.0 meters (> 13) [30 pts]       > 1.0 m + 1.5 m (> 3.3* - 4.8) [15 pts]         > 3.0 m (> 9*7* - 4*6*) [20 pts]       > 1.0 m (> 3*3* - 4.8) [15 pts]         > 1.5 m - 3.0 m (> 9*7* - 4*6*) [20 pts]       AVERAGE BANKFULL WIDTH (meters)         COMMENTS       AVERAGE BANKFULL WIDTH (meters)         RIPARIAN ZONE AND FLOODPLAIN QUALITY       XNOTE: River Left (L) and Right (R) as looking downstream\$*         RIPARIAN MDTH       FLOODPLAIN QUALITY         X Were a to move the forest of the status of the completed         RIPARIAN WDTH       FLOODPLAIN QUALITY         Mature Forest, Wetland       Conservation Tillage         Moderate 5-10m       Immature Forest, Shinb or Old       Utban or industrial         Natrow <5m				15
> 4.0 meters (> 13) [30 pts]       > 1.0 m - 1.5 m (> 3' 3' - 4' 8') [15 pts]         > 3.0 m - 4.0 m (> 9' 7' - 13') [25 pts]       > 1.0 m (> 3' 3' - 4' 8') [15 pts]         > 3.0 m - 4.0 m (> 9' 7' - 4' 6'') [20 pts]       AVERAGE BANKFULL WIDTH (meters)         This information must also be completed         RIPARIAN ZONE AND FLOODPLAIN QUALITY         L       R. (Per Bank)       L         M       ELOOPPLAIN QUALITY       XNOTE: River Left (L) and Right (R) as looking downstreams?         RIPARIAN ZONE AND FLOODPLAIN QUALITY       XNOTE: River Left (L) and Right (R) as looking downstreams?         RIPARIAN WDTH       FLOOPPLAIN QUALITY         L       R         Ø       Wide >10m         Moterate 5-10m       Mature Forest, Shrub or Old         Immature Forest, Shrub or Old       Urban or Industrial         Field       Open Pasture. Row         Open Pasture. Row       Crop         Nane       Fenced Pasture         Vining or Construction       Mining or Construction         Stream Flowing       Check ONLY one box)         Stream Flowing       Moist Channel, isolated pools, no flow (intermittent)         Subsurface Row with isolated pools (interslitial)       Dry channel, no water (Ephemerai)         COMMENTS			15	
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]       \$ 1.0 m (\$ 3' 3'') [5 pts]         > 1.5 m - 3.0 m (> 9' 7" - 4' 6") [20 pts]       AVERAGE BANKFULL WIDTH (meters)         COMMENTS		average of 3-4 measurements) (	Check ONLY one box):	Bankfull
AVERAGE BANKFULL WIDTH (meters)         This information must also be completed         RIPARIAN ZONE AND FLOODPLAIN QUALITY         Image: Riper Left (L) and Right (R) as looking downstreams?         RIPARIAN WDTH       FLOODPLAIN QUALITY         Image: Riper Left (L) and Right (R) as looking downstreams?         RIPARIAN WDTH       FLOODPLAIN QUALITY         Image: Riper Left (L) and Right (R) as looking downstreams?         RIPARIAN WDTH       FLOODPLAIN QUALITY         Image: Riper Left (L) and Right (R) as looking downstreams?         RIPARIAN WDTH       FLOODPLAIN QUALITY         Image: Riper Left (L) and Right (R) as looking downstreams?         RIPARIAN WDTH       FLOODPLAIN QUALITY         Image: Riper Left (L) and Right (R) as looking downstreams?         Image: Riper Left (L) and Right (R) as looking downstreams?         Image: Riper Left (L) and Right (R) as looking downstreams?         Image: Riper Left (L) and Right (R) as looking downstreams?         Image: Riper Left (L) and Right (R) as looking downstreams?         Image: Riper Left (L) and Right (R) as looking downstreams?         Image: Riper Left (R) Ri	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]			Width Max=30
AVERAGE BANKFULL WIDTH (meters)         This information must also be completed         RIPARIAN ZONE AND FLOODPLAIN QUALITY         L R       (Per Bank)       L R       (Most Predominant per Bank)       L R         Vide >10m       Mature Forest, Wetland       Conservation Tillage         Moderate 5-10m       Immature Forest, Wetland       Conservation Tillage         Narrow <5m	LJ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]			15
RIPARIAN ZONE AND FLOODPLAIN QUALITY       TNOTE: River Left (L) and Right (R) as looking downstream: RIPARIAN WIDTH       FLOODPLAIN QUALITY         L       R       (Per Bank)       L       R       (Most Predominant per Bank)       L       R         Image:	COMMENTS	AVERA	GE BANKFULL WIDTH (meters)	
L       R       (Per Bank)       L       R       (Most Predominant per Bank)       L       R         Ø       Wide >10m       Imature Forest, Wetland       Imature Forest, Wetland       Imature Forest, Shrub or Old	RIPARIAN ZONE AND FLOODP			
Image: Wide >10m       Image: Mature Forest, Wetland       Image: Conservation Tillage         Image: Moderate 5-10m       Image: Image				
Field       Field       Open Pasture, Row Crop         Narrow <5m				
Narrow <5m	Moderate 5-10m		d 🔲 🗍 Urban or Industrial	
None       Penced Pasture       Mining or Construction         COMMENTS	DD Narrow <5m	<b>a a</b>		1. mar
FLOW REGIME (At Time of Evaluation)       (Check ONLY one box):         Stream Flowing       Image: Subsurface flow with isolated pools (interstitial)         Subsurface flow with isolated pools (interstitial)       Image: Subsurface flow with isolated pools (interstitial)         COMMENTS       COMMENTS	None			
Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS	COMMENTS			-
	Stream Flowing Subsurface flow with isolated poo	Moist (	• • • • • • • • • • • • • • • • • • • •	)
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	SINUOSITY (Number of bends o	per 61 m (200 ft) of channel) (Check ONL)	Yone box):	
None         1.0         2.0         3.0           0.5         1.5         2.5         1.5		1.0 🖸 2.0		
STREAM GRADIENT ESTIMATE  Fiat (0.5 ki/100 m)  Fiat to Moderate  M	STREAM GRADIENT ESTIMATE			

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PHWH Form Page - 1

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DITIONAL STREAM INFORMA	TION (This Information Must Also	o be Completed):			
QHEI PERFORMED? -	Yes No QHEI Score	(If Yes, Attach C	ompleted QHEL Form)		
			stance from Evaluated	Stream	
	PIES OF MAPS, INCLUDING THE EN				_
	Town, WV-OH				
0 MISCELLANEOUS					
se Flow Conditions? (Y/N):	Date of last precipitation:	11/29/05	Quantity: untr	om	
otograph Information:	LQ				_
••••	Canopy (% open): / 0 4				
ere samples collected for water	chemistry? (Y/N): <u>N</u> (Note Ial	b sample no. or id. and a	ttach results) Lab Nun	1ber:	
eid Measures: Temp (*C)	Dissolved Oxygen (mg/l)	pH (S.U.)	Conductivity (µmh	os/cm)	_
the sampling reach representati	ive of the stream (Y/N) If not,	, please explain:			
ditional comments/description o	of pollution impacts:		<u></u>		
anformed? (Y/N): (II	Yes, Record all observations. Vouch I number. Include appropriate field dat				h <del>e</del> sile
sh Observed? (Y/N) V ogs or Tadpoles Observed? (Y/	oucher? (Y/N) Salamanders ( N) Voucher? (Y/N) Aqua	Observed? (Y/N) alic Macroinvertebrates (	Voucher? (Y/N) )bserved? (Y/N)	Voucher? (Y/N)	
omments Regarding Biology:					<u></u>
					<u></u>
		,			
	NARRATIVE DESCRIPTION		· · · · · · · · · · · · · · · · · · ·		on
11111111111111111111111111111111111111					
	Ron Bring				
	Routes Ros				

二

class II

Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :

Primary H	leadwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) ; 43	3
SITE NAME/LOCATION AMP -O		
	S-12_ RIVER BASIN DRAINAGE AREA (mi²)	
LENGTH OF STREAM REACH (ft) L		
DATE 11/2905 SCORER MAL	ATLONG RIVER CODE RIVER MILE	
	- Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for instruction	
	URAL CHANNEL FRECOVERED BRECOVERING BRECENT OR NO RECOVER	RY
MODIFICATIONS:	7	
		IHEI
TYPE PEI BLDR SLABS (16 pts)		ietric oints
BOULDER (>256 mm) [16 pts]	LEAF PACK/WOODY DEBRIS [3 pts]	
BEDROCK [16 pt]		ubstrate lax = 40
COBBLE (65-256 mm) [12 pts]		<u> </u>
SAND (<2 mm) [6 pts]	6 ARTIFICIAL [3 pts]	0
Total of Percentages of		A + B
Bidr Slabs, Bouider, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBST		
	culverts or storm water pipes) (Check ONLY one box):	ol Depth lax = 30
> 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts]	> 5 cm - 10 cm [15 pts] <.5 cm [5 pts]	15
0 > 10 - 22.5 cm [26 pts]	NO WATER OR MOIST CHANNEL [0 pts]	
COMMENTS	MAXIMUM POOL DEPTH (centimeters):	
<ol> <li>BANK FULL WIDTH (Measured as the a</li> <li>&gt; 4.0 meters (&gt; 13) [30 pts]</li> </ol>		lankfull Width
> 3.0 m - 4.0 m (≥ 9' 7" - 13') [25 pts]		lax=30
≥ 1.5 m - 3.0 m (> 9' 7" - 4' 6") [20 pts]		2
COMMENTS	AVERAGE BANKFULL WIDTH (meters)	$\mathbf{O}$
	This information must also be completed	
RIPARIAN ZONE AND FLOODPL RIPARIAN <u>WDTH</u>	LAIN QUALITY SNOTE: River Left (L) and Right (R) as looking downstreams	
(Per Bank)	FLOODPLAIN QUALITY LB- (Most Predominant per Bank) LR	
Wide >10m	Mature Forest, Welland D Conservation Tillage	
D D Moderate 5-10m	Field Urban or Industrial	
Narrow <5m	Residential, Park, New Field     Open Pasture, Row     Crop	
	Fenced Pasture     Mining or Construction	
FLOW REGIME (At Time of Evalu	Moist Channel, isolated pools, no flow (Intermittent)	
Subsurface flow with isolated pools COMMENTS	s (Interstitial) Dry channel, no water (Ephemeral)	
	er 61 m (200 ft) of channel) _[Check ONLY one box);	
	, 1.0 🖸 2.0 🛛 3.0	
0.5	1.5 LJ 2.5 LJ >3	
STREAM GRADIENT ESTIMATE	O Moderate (2 10/100 /l) O Moderate to Severe O Severe (10 10/100 /l)	

## BS-12

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ADDITIONAL STREAM INFORMATION (This Information Must Also	
QHEI PERFORMED? - DYes 2 No QHEI Score	(If Yes, Attach Completed QHEI Form)
WWH Name:	
CWH Name:	
] EWH Name:	Distance from Evaluated Stream
	TIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: <u>New Harren, WV-0H</u>	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: neigh Towns	enip/city: Letant Falls, Ohio area
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation:   (	(2105 ausness: unknown
Photograph Information: <u>QD, QL</u> (inc)	
Elevated Turbidity? (Y/N): N Canopy (% open);	
Were samples collected for water chemistry? (Y/N): <u>V</u> (Note lab	
	pH (S.U.) Conductivity (µmhos/cm)
is the sampling reach representative of the stream (Y/N) $\underline{Y}$ if not,	please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	r collections optional. NOTE: all voucher samples must be labeled with the
· · · · · · · · · · · · · · · · · · ·	a sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders C	Deserved? (Y/N) Voucher? (Y/N)
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqua	tic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
DRAWING AND NARRATIVE DESCRIPTION	OF STREAM REACH (This must be completed):
	or site evaluation and a narrative description of the stream's location
	- - -
12	- A h
FLOW -	N n lit
	Frank T
$\checkmark$	٣ <b>٢</b>
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	<u>1</u>
PHWH	Form Page - 2

HHEI SCORE (sum of metrics 1, 2, 3) : 86

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Class II

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SITE NAME/LOCATION		S-B	RIVER BASI	N	DR	AINAGE AREA (mi²)	
LENGTH OF STREAM RE	CORER JAV	COM					
NOTE: Complete All I STREAM CHANNEL MODIFICATIONS:						H Streams" for Instru RECENT OR NO RECO	
(Max of 32). Add t TYPE BLDR SLABS BOULDER (>2 BEDROCK () COBBLE (65-2 GRAVEL (2-6-2) SAND (<2 mm	[16 pts]      i         256 mm) [16 pts]      i         16 pti      i         256 mm) [12 pts]      i         4 mm) [9 pts]      i         () [6 pts]      i         centages of er, Cobble, Bedrock      i	SO%		ax of 8). Final metr SILT (3 pt) LEAF PACK/WOOE FINE DETRITUS (3 CLAY or HARDPAN VIUCK (0 pts) ARTIFICIAL (3 pts)	ic score is sum by DEBRIS [3 pi 3 pts] 4 [0 pt]	6) (B) (C) (C) (C) (C) (C) (C) (C) (C) (C) (C	HHEI Metric Points Substrate Max = 40 3 3 A+B
evaluation, Avoid > 30 centimeters [2 > 22:5 - 30 cm [30 > 10 - 22:5 cm [25	pts]	ulverts or s	storm water pip	es) (Check ONL > 5 cm - 10 cm [11 < 5 cm [ <b>5 pts</b> ] NO WATER OR M	Y one box): 5 pts] IOIST CHANNE	L [0 pts]	Pool Depth Max = 30 2 5
3. BANK FULL WID > 4.0 meters (> 13") > 3.0 m - 4.0 m (> > 1.5 m - 3.0 m (>	TH (Measured as the av	verage of 3	-4 measureme D D	ents) (Che > 1.0 m - 1.5 m (> ≤ 1.0 m (≤ 3'3")[5	ck ONLY one t 3' 3" - 4' 8") [15 ; pts]	xox): ts]	Bankfuli Width Max=30 30
<u>RIPARIA</u> L & (Per Ba L U Wide >	10m te 5-10m <5m		TY \$NOT LAIN QUALITY (Most Predom Mature Forest	inant per Bank) , Wetland sst, Shrub or Old ark, New Field		Conservation Tillage Urban or Industrial Open Pasture, Row Crop Mining or Construction	
Stream Fid Subsurface COMMEN	flow with isolated pools	(Interstitial) 61 m (200	)	Moist Cha     Dry chann      Check ONLY on	el, no water (Ep	ools, no flow (Intermittent) ihemeral)	
None     None     0.5     STREAM GRADI     Flat (0.5 IV100 tt)	ENT ESTIMATE D Flat to Moderate	1.0 1.5	rate (2 1/100 N)	2.0 2.5	e to Severe	3.0 >3	00 ft)

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		<u> </u>	BS-13
DDITIONAL STREAM INFORMATION (Th			
QHEI PERFORMED? - 🖸 Yes	No QHEI Score (	If Yes, Attach Completed QHEI For	n)
DOWNSTREAM DESIGNATED U			
J www.H Name:			
CWH Name:			
J EWH Name:			
MAPPING: ATTACH COPIES OF N	MAPS, INCLUDING THE <u>ENTIRE</u> WA	TERSHED AREA. CLEARLY MARK	THE SITE LOCATION
ISGS Quadrangle Name:	NRCS	Soil Map Page: NRCS So	il Map Stream Order
county:	Township / Cit	y:	
<b>MISCELLANEOUS</b>			
Base Flow Conditions? (Y/N): Date	e of last precipitation: $11/29/6$	25 Quantity: UMh	norm
Photograph Information:			······
Elevated Turbidity? (Y/N): <u>N</u> C			
Vere samples collected for water chemistry	? (Y/N): (Note lab sample	no, or id, and attach results) Lab Ne	amber:
		H (S.U.) Conductivity (µrr	•
s the sampling reach representative of the s	stream (Y/N)_7 If not, please e	explain:	
IO number. 1	Include appropriate field data sheets (/N) Salamanders Observed	ons optional. NOTE: all voucher samp from the Primary Headwaler Habitat A ? (Y/N) Voucher? (Y/N) pinvertebrates Observed? (Y/N)	ssessment Manual)
DRAWING AND NARRA		TREAM REACH (This <u>must</u> reluation and a narrative descriptio	
FLOW - 21		What we have a series of the s	arbitration 3 million and and and and and and and and and an
Defendent 24, 2002 Baulation	PHWH Form P	2ge - 2	

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		HHEI Score (	ation Form (sum of metrics 1, 2, 3) :	19
Stream	LOCATIONSITE NUMBER	S-14 RIVER BASIN		Mi .
LENGTH OF	STREAM REACH (ft) ろつつ '	LATLONGRIV	ER CODE RIVER MILE	
		m - Refer to "Field Evaluation Manual for		iction
		TURAL CHANNEL 🗇 RECOVERED 🛛 🗐 REC		
MODIFIC/				
1. SUE	BSTRATE (Estimate percent of eve	ery type of substrate present. Check ON/LY byo	predominant substrate TYPE boxes	
	ix of 32). Add total number of signific	ant substrate types found (Max of 8). Final metric		HI Me
	BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts]		<u> 75</u>	Po
			(en	Sub: Max
ם פ	GRAVEL (2-64 mm) (9 pbs)			2
	SAND (<2 mm) [6 pts]			
	Total of Percentages of Slabs, Bouider, Cobble, Bedrock <u>(</u>	6 % 45	<sup>(B)</sup> 4	A+
	TWO MOST PREDOMINATE SUBS		R OF SUBSTRATE TYPES:	
eval	luation. Avoid plunge pools from road	aximum pool depth within the 61 meter (200 ft) d culverts or storm water pipes) (Check ONLY of	one box):	Pool Mex
>22	centimeters [20 pts] .5 - 30 cm [30 pts]	□ > 5.cm - 10 cm [16:p □ < 5 cm [5 pts]		
	22.5 cm [25 pts]		XST CHANNEL [0 pts]	
	MMENTS		DOL DEPTH (centimeters):	-
	NK FULL WIDTH (Measured as the meters (> 13') [30 pts]	<b>O</b> >10m-15m/>3	<b>k</b> ONLY one box): 3 <sup>*</sup> -4' 8') [15 pts]	Ban Wi
>3.0	)m -4.0m (> 9' 7" - 13') [26 pts] im -3.0m (> 9' 7" - 4'8") [20 pts].			
শ্ব ৯৫	MMENTS	AVERAGE BA	ANKFULL WIDTH (meters)	Max Q
্ষ ৯৫		AVERAGE BA	ANKFULL WIDTH (meters)	ら
ষ ৯৫		This information <u>must</u> also be complete	ANKFULL WIDTH (meters)	ら
ষ ৯৫	RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH R_ (Per Bank)	This information must also be complete         PLAIN QUALITY       ☆NOTE: River Left (L) and         FLOODPLAIN QUALITY         L_R_       (Most Predominant per Bank)	ANKFULL WIDTH (meters)	ら
میں الع/ coi	RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH R (Per Bank) Wide >10m	This information <u>must</u> also be complete PLAIN QUALITY TONOTE: River Left (L) and <u>FLOODPLAIN QUALITY</u> L R (Most Predominant per Bank) Mature Forest, Wetland Mature Forest, Shrub or Old	ANKFULL WIDTH (meters)	ら
,⊠d ,⇒ius coi	RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH R (Per Bank) Wide >10m Moderate 5-10m	This information <u>must</u> also be complete PLAIN QUALITY ANOTE: River Left (L) and <u>FLOODPLAIN QUALITY</u> L R (Most Predominant per Bank) Mature Forest, Wetland	ANKFULL WIDTH (meters)	ら
сон Сон Сон Сон Сон	RIPARIAN ZONE AND FLOODP <u>RIPARIAN WIDTH</u> R (Per Bank) Wide >10m Moderatě 5-10m Narrow <5m None	This information <u>must</u> also be complete PLAIN QUALITY $\Im NOTE:$ River Left (L) and <u>FLOODPLAIN QUALITY</u> L R (Most Predominant per Bank) Mature Forest, Wetland Immature Forest, Shrub or Old Field	ANKFULL WIDTH (meters)	ら
کی cov کی ال ال ال ال ال ال ال ال ال ال ال ال ال	RIPARIAN ZONE AND FLOODP <u>RIPARIAN WIDTH</u> R (Per Bank) Wide >10m Moderate 5-10m Narrow <5m None COMMENTS	This information must also be complete         PLAIN QUALITY       ☆NOTE: River Left (L) and         FLOODPLAIN QUALITY         L       R         (Most Predominant per Bank)         Mature Forest, Wetland         Immature Forest, Shrub or Old         Field         Residential, Park, New Field         Fenced Pasture	ANKFULL WIDTH (meters)	ら
دم دم لا لا لا لا لا لا لا لا لا لا لا لا لا	RIPARIAN ZONE AND FLOODP <u>RIPARIAN WIDTH</u> R (Per Bank) Wide >10m Moderate 5-10m Narrow <5m None COMMENTS	This information <u>must</u> also be complete PLAIN QUALITY $\bigstar$ NOTE: River Left (L) and <u>FLOODPLAIN QUALITY</u> L R (Most Predominant per Bank) Mature Forest, Wetland Immature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture Moist Channe	ANKFULL WIDTH (meters)	ら
	RIPARIAN ZONE AND FLOODP <u>RIPARIAN WIDTH</u> R (Per Bank) Wide >10m Noderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time of Evel Stream Flowing Subsurface flow with isolated poo COMMENTS SINUOSITY (Number of bends p	This information <u>must</u> also be complete PLAIN QUALITY ${\longrightarrow}$ NOTE: River Left (L) and <u>FLOODPLAIN QUALITY</u> L R (Most Predominant per Bank) Mature Forest, Wetland Mature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture Huation) (Check ONLY one box): Moist Channel, Dry channel, per 61 m (200 ft) of channel) (Check ONLY one box)	ANKFULL WIDTH (meters)	ら
	RIPARIAN ZONE AND FLOODP <u>RIPARIAN WIDTH</u> R (Per Bank) Wide >10m Noderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time of Evel Stream Flowing Subsurface flow with isolated poo COMMENTS	This information <u>must</u> also be complete PLAIN QUALITY $\Rightarrow$ NOTE: River Left (L) and <u>FLOODPLAIN QUALITY</u> L R (Most Predominant per Bank) Mature Forest, Wetland Immature Forest, Shrub or Old Field Residential, Park, New Field Fenced Pasture Huation) (Check ONLY one box): Moist Channel, Dry channel,	ANKFULL WIDTH (meters)	ら

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MAPPING: ATTACH COPIES OF MAPS, INCLIDING THE ENTER WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         SGS Clustrangle Name: <u>Murch Marren</u> , <u>Murch Marren</u> , <u>Murch Soli Map Page</u> , <u>NRCS Soli Map Sheam Order</u> , <u>Murch Steam Order</u>	ADDITIONAL STREAM INFORMAT	TION (This Information Must Also be Co	mpleted):	BS-14
DOWNETTEAM DESIGNATED USE(5) DWY Hams:	QHEI PERFORMED? - [		(If Yes, Attach Comple	ted QHEI Form)
DOWN Hame:		• •		
JEWH Name:	_			
MAPPING: ATTACH COPIES OF MAPS, INCLIDING THE ENTER WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         SGS Clustrangle Name: <u>Murch Marren</u> , <u>Murch Marren</u> , <u>Murch Soli Map Page</u> , <u>NRCS Soli Map Sheam Order</u> , <u>Murch Steam Order</u>	CWH Name:      EWH Name:			
SGS Quadrangle Name:       Number:       Number:       NRCS Soil Map Page:       NRCS Soil Map Stream Order         ounly:	MAPPING: ATTACH COP	IES OF MAPS, INCLUDING THE ENTIRE W	ATERSHED AREA. CL	EARLY MARK THE SITE LOCATION
ounty:	-	11		
NESCELLANEOUS       ////////////////////////////////////				
hetograph Information:	Ų	7	"y. <u> </u>	
levated Turbidity? (Y/N):	Base Flow Conditions? (Y/N):	Date of last precipitation: $11 - 29$	<u>-0う</u> Quan	in interom
Here samples collected for water chemisity? (Y/N):	Photograph Information:		<u></u>	
eld Measures:       Temp (*C)       Dissolved Oxygen (mg/l)PH (\$.U)       Conductivity (unitoxian)         the sampling reach representative of the stream (Y/N)	Elevated Turbidity? (Y/N):	Canopy (% open): <u>40 <sup>©</sup>)0</u>		
the sampling reach representative of the stream (Y/N) // If not, please explain:	Were samples collected for water ch	nemistry? (Y/N): <u>N</u> (Note lab sample	e no. or id. and attach r	esults) Lab Number:
the sampling reach representative of the stream (Y/N) // If not, please explain:	Field Measures: Temp (°C)	Dissolved Oxygen (mg/l) p	oH (S.U.) Co	onductivity (µnitios/cm)
BIOTIC EVALUATION         erformed? (Y/N):	is the sampling reach representative	e of the stream (Y/N) If not, please (	explain:	
BIOTIC EVALUATION         erformed? (Y/N):		•		· · · · · · · · · · · · · · · · · · ·
erformed? (YM):	Additional comments/description of	poliution impacts:		•
Dinumber. Include appropriate field data sheets from the Primary Headwater Habital Assessment Manual) sch Observed? (Y/N) Voucher? (Y/N) vou	BIOTIC EVALUATION			
sh Observed? (Y/N) Voucher? (Y/N) Salamenders Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) oucher? (Y/N				
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): Include Important landmarks and other features of interest for site evaluation and a narrative description of the stream's location	Fish Observed? (Y/N) Vou	cher? (Y/N) Salamanders Observed	1? (Y/N) Vouch	er? (Y/N)
Include important landmarks and other features of interest for sile evaluation and a narrative description of the stream's location	Comments Regarding Biology:	······································		
Include important landmarks and other features of interest for sile evaluation and a narrative description of the stream's location				
Include important landmarks and other features of interest for sile evaluation and a narrative description of the stream's location				
Include important landmarks and other features of interest for sile evaluation and a narrative description of the stream's location	DRAWING AND N	ARRATIVE DESCRIPTION OF S	TREAM REACH	This must be completed):
Clobe estation of the state of		•		
Clobe estation of the state of	EFWey!	es in the second	60 rel	*
	FLOW		e) A	•••
DHWH Earn Dags 2	3. S. S.	the steel	2 5	
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40 HHEI Score (sum of metrics 1, 2, 3) :

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Class II

SITE NAME/LOCATION AMP ON	S-15 RIVER BASIN	
LENGTH OF STREAM REACH (#) / 60		
DATE 29 Nos 05 SCORER Kosser/Uns		
NOTE: Complete All Items On This Form	Refer to "Field Evaluation Manual for Oh	io's PHWH Streams" for Instructions
	RAL CHANNEL 🗍 RECOVERED 🗍 RECOV	
MODIFICATIONS:		
(Max of 32). Add total number of significant TYPE BLDR SLABS [16 pts] PER BOULDER (>256 mm) [16 pts] SEDROCK [16 pt] SEDROCK [16 pt] SEDROCK [16 pt] SEDROCK [16 pt] SAND (<2 mm) [6 pts] SEDROCK SEDROC	type of substrate present. Check ONLY two pretsubstrate types found (Max of 8). Final metric science         tsubstrate types found (Max of 8). Final metric science	Image: bore is sum of boxes A & B.     HHEI       PERCENT     Metric       EBRIS [3 pts]     Image: boxes A & B.       Image: boxes A & B.     HHEI       Substrate     Max = 40       Image: boxes A & B.     Image: boxes A & B. <tr< td=""></tr<>
SCORE OF TWO MOST PREDOMINATE SUBSTR	ATE TYPES: Management TOTAL NUMBER (	
evaluation. Avoid plunge pools from road of > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] > 10 - 22.6 cm [25 pts]	imum pool depth within the 61 meter (200 ft) ev ulverts or storm water pipes) (Check ONLY one 5 cm - 10 cm [15 pts] 5 cm [5 pts] NO WATER OR MOIS MAXIMUM POO	e box): ] T CHANNEL [0 pts]
	rerage of 3-4 measurements) (Check C	
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 6") [20 nts]	→ 1.0 m - 1.5 m (> 3' 3") ≤ 1.0 m (≤ 3' 3") [5 pts]	
> 1.5 m - 3.0 m (> 9'7" - 4' 8") [20 pts]		
COMMENTS	AVERAGE BAN	KFULL WIDTH (meters)
RIPARIAN ZONE AND FLOODPL. RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m Narrow <5m None COMMENTS	This information must also be completed         AIN QUALITY       Image: NOTE: River Left (L) and Right Reserve to the second s	ght (R) as looking downstreams L R Conservation Titlage Urban or Industriat Open Pasture, Row Crop Mining or Construction
FLOW REGIME (At Time of Evaluated Stream Flowing         Subsurface flow with isolated pools         COMMENTS         SINUOSITY (Number of bends per None	Moist Channel,	x):
	1.5 🖸 2.5	
STREAM GRADIENT ESTIMATE	D Moderate (2 IV100 It) D Moderate to 5	Severe 🔲 Severe (10 liv100 li)

	BS-1
DITIONAL STREAM INFORMATION (This info	ormation Must Also be Completed);
	QHEI Score (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
	Distance from Evaluated Stream
	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
•	INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
SGS Quadrangle Name: New Nave	M, WV-OH NRCS Soil Map Page: NRCS Soil Map Stream Order
ounty: Mega	Township/City: Letart Fells Ohio area
MISCELLANEOUS	
ase Flow Conditions? (Y/N): Date of las	st precipitation: 11/24/05 Quantity: untrum
notograph information: <u>56 + 59</u>	9 Maris contra
levated Turbidity? (Y/N): Canopy	9 Maris contra (% open): 15%
fere samples collected for water chemistry? (Y/N)	); (Note lab sample no. or id. and attach results) Lab Number:
ield Measures: Temp (°C) Dissolved	I Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
s the sampling reach representative of the stream	n (Y/N) If not, please explain:
	• • • • • • • • • • • • • • • • • • •
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all o	observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site
10 number, include	e appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
ish Observed? (Y/N) Voucher? (Y/N)	Salamanders Observed? (Y/N) Voucher? (Y/N)
	er? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	· · · · · · · · · · · · · · · · · · ·
	E DESCRIPTION OF STREAM REACH (This must be completed):
	eatures of interest for site evaluation and a narrative description of the stream's location
	seat the provide
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October 24, 2002 Revision	PHWH Form Page - 2

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ClassI

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	НН	El Score (sum of met	rics 1, 2, 3) :	/7
SITE NAME/LOCATION AMP-OH				
		ORA		
LENGTH OF STREAM REACH (#) LAT	LONG	RIVER CODE	RIVER MILE	
DATE 11/29/05 SCORER MOL				
NOTE: Complete All Items On This Form - R	eler to "Field Evaluation	Manual for Ohio's PHWH	l Streams" for instru	uctions
			RECENT OR NO RECO	VERY
MODIFICATIONS:				
<ol> <li>SUBSTRATE (Estimate percent of every ty (Max of 32). Add total number of significant si</li> </ol>				HHEI
TYPE PERCI		1	PERCENT 30	Metric Points
BLDR SLABS [16 pts]     BOULDER (>256 mm) [16 pts]		PACKWOODY DEBRIS [3 pts		• •••••
DD BEDROCK [16 pt]		ETRITUS [3 pts]	-20_	Substrate Max ≠ 40
COBBLE (65-256 mm) [12 pts]     GRAVEL (2-64 mm) [9 pts]		or HARDPAN [0 pt]	20	
GRAVEL (2-64 mm) [9 pts]	N STATE	(0 pts) ICIAL (3 pts)		14
Total of Percentages of			(8)	
Bidr Slabs, Boulder, Cobble, Bedrock	- 151	OTAL NUMBER OF SUBSTR	4	A+B
2. Maximum Pool Depth (Measure the maxim			ch at the time of	Pool Depth
evaluation. Avoid plunge pools from road cult > 30 centimeters [20 pts]		(Check O/VLY one box): m - 10 cm [15 pts]		Max = 30
> 22.5 - 30 cm [30 pts]		m [5 pts] VATER OR MOIST CHANNEL	10 atral	15
> 10 - 22.5 cm [25 pts]				
3. BANK FULL WIDTH (Measured as the aver	age of 3-4 measurements)	(Check ONLY one bo	x):	Bankfull
		m - 1,5 m (> 3' 3" - 4' 8") [15 pt m (≤ 3' 3") [5 pts]	5)	Width <u>Max=30</u>
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		un (a. e. à la bra)	[ <b></b> ]	
COMMENTS		AVERAGE BANKFULL WID	TH (meters)	22
	This information must als	o be completed		مانبنالك فسيبيهن وزيرت
RIPARIAN ZONE AND FLOODPLAI	N QUALITY SYNOTE: Riv	er Left (L) and Right (R) as loc	king downstreams	
RIPARIAN WIDTH E	LOODPLAIN QUALITY B (Most Predominant p	ber Bank) L. R		
Vide >10m	Mature Forest, Wells	and 🗍 🗍	Conservation Tillage	
Moderate 5-10m	Immature Forest, Sh     Field	nub or Old	Urban or Industrial	
□ □ Narrow <5m	C Residential Park N	ew Field 🛛 🗍	Open Pasture, Row	
COMMENTS WE MAN	Fenced, Pasture		Crop Mining or Construction	
FLOW REGIME (At Time of Evaluation Stream Flowing Subsurface flow with isolated pools (in COMMENTS	<u> </u>	Moist Channel, isolated poo Dry channel, no water (Ept	• • • •	
SINUOSITY (Number of bends per 6	1 m (200 ft) of channel) - {Ch 1.0	eck ONLY one box): 2.0	3.0	
	.s n	2.5	>3	
STREAM GRADIEN FÉSTIMATE	J Moderate (2 ivitod it)	Moderate to Severe	Severe (10 10 10	X0 (t)

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DDITIONAL STREAM INFORMATION (This Information Must /	· · · · · · · · · · · · · · · · · · ·
CHEI PERFORMED? - C Yos No QHEI Score_	(If Yes, Altach Completed QHE: Form)
DOWNSTREAM DESIGNATED USE(S)	
	Distance from Evaluated Stream
	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
	E <u>Entire</u> watershed area. Clearly mark the site location
	OH NRCS Soil Map Page: NRCS Soil Map Stream Order
ounty: Me' f S Tr	ownship/city: Letart Falls, Ohio area
MISCELLANEOUS	
tase Flow Conditions? (Y/N): Date of last precipitation:	11/29/05 quantity unternorm
holograph Information: yes #42, 43	3
levaled Turbidity? (Y/N): Canopy (% open):	
Vere samples collected for water chemistry? (Y/N): $\underline{N}_{}$ (Note	e lab sample no. or id. and attach results) Lab Number:
ield Measures: Temp ('C) Dissolved Oxygen (mg/i)	ρΗ (S.U.) Conductivity (μπhos/cm)
	not, please explain:
s the sampling reach representative of the stream (17N) if	not, please explain:
	nucher collections optional. NOTE: all voucher samples must be labeled with the s d data sheets from the Primary Headwater Habitat Assessment Manual)
Tish Observed? (Y/N) Voucher? (Y/N) Salamande Trogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) A Comments Regarding Biology:	ers Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
DRAWING AND NARRATIVE DESCRIPT	ION OF STREAM REACH (This must be completed):
Include Important landmarks and other features of intere	est for site evaluation and a narrative description of the stream's location
4.	Kill
the stand	
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October 24, 2002 Revision

PHWH Form Page - 2

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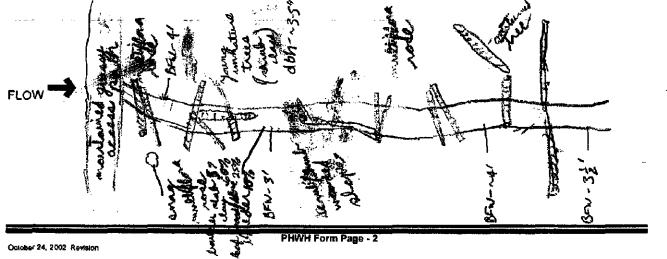
Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) :	∘⊥ 5
SITE NAME/LOCATION AMP - OH	
LENGTH OF STREAM REACH (11) LAT. LONG. RIVER CODE RIVER MILE DATE 11/30/05 SCORER MBL/JAV COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for instruct	tions
STREAM CHANNEL ON NONE / NATURAL CHANNEL OF RECOVERED RECOVERING RECENT OR NO RECOVER MODIFICATIONS:	ERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI
TYPE PERCENT TYPE PERCENT	Metric Points
BOULDER (>256 mm) [16 pts] 5% DIM LEAF PACKWOODY DEBRIS [3 pts] 20%	
I LI I BEDRUCK NIS BALL I LI VI FINE DE IRTUS IS DISI - 72. I	Substrate Max = 40
GRAVEL (2-64 mm) [9 pts] 5% 0 0 MUCK [0 pts] 5%	
□ □ SAND (<2 mm) [6 pts] 10% □ □ ARTIFICIAL [3 pts] [3/	[0
Total of Percentages of (B) Bidr Stabs, Bouldar, Cobble, Bedrock 5% (A) SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES:	A+8
	ool Depth
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):	<u>Max = 30</u>
□ > 22.5 - 30 cm [30 pts] □ < 5 cm [5 pts]	Ø
ß	
COMMENTSMAXIMUM POOL DEPTH (centimeters):	
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Bankfull Width
□ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] □ ≤ 1.0 m (≤ 3' 3") [5 pts] □ □ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] □	Max=30
COMMENTSAVERAGE BANKFULL WIDTH (meters)	(5
This information must also be completed           RIPARIAN ZONE AND FLOODPLAIN QUALITY         ☆NOTE: River Left (L) and Right (R) as looking downstream ☆           RIPARIAN WIDTH         FLOODPLAIN QUALITY	
L/R/ (Per Bank) L R (Most Predominant per Bank) L R 2 S Wide >10m D Mature Forest, Wetland D Conservation Tillage	
Moderate 5-10m     D     D     Moderate 5-10m     D     D     Moderate 5-10m     D     D     Moderate 5-10m     D	
D Narrow <5m D Residential Park New Field D Open Pasture, Row	
Crop	
COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS	
SINUOSITY (Number of bends per 61 m (200 ft) of channel)         (Check O/VLY one box):           None         1.0         2.0         3.0           0.5         1.5         2.5         >3	
STREAM GRADIENT ESTIMATE Flat (0.5. R/100 n) Flat to Moderate Moderate (2 fl/100 n) Moderate to Severe Conservere Conservere (10 flat (0.5. R/100 n)	0

PHWH Form Page - 1

	Score (I Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
] WWH Name:	Distance from Evaluated Stream
<b>D</b> CWH Name:	Distance from Evaluated Stream Distance from Evaluated Stream
JEWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUD	ING THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
JSGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County:	Township / City:
MISCELLANEOUS	,
Sase Flow Conditions? (Y/N): Date of last precip	sitation: 11 /29/05 Quantity unknown
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% open	1): ~ 40% wooded slope, leaves have fal
	(Note lab sample no. or id. and attach results) Lab Number:
ield Measures: Temp (°C) Dissolved Oxygen	) (mg/l) pH (S.U.) Conductivity (µmhos/cm)
s the sampling reach representative of the stream (Y/N)_	/ If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observati	ions. Voucher collections optional. NOTE: all voucher samples must be labeled with the site riate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Sa	iamanders Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Front of Technoles Observed? (Y/N) \outbor? (Y/N)	) Agustic Macromusclebrates (Disemed 2 (V/M) VAucher 2 (V/M)

#### DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



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Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 69

SITE NAME/LOCATION AMPCOH	
DATE 11/30/05 SCORER JAV COMMENTS NVERCODE NVERCODE	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructi	ons
STREAM CHANNEL	Þν
MODIFICATIONS:	<b>N</b> 1
	منظور المحمد
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHE
TYPE PERCENT TYPE PERCENT M	letric oints
0 0 BOULDER (>256 mm) [16 pts] <u>25%</u> 00 LEAF PACKWOODY DEBRIS [3 pts] <u>14%</u>	
	ubstrate lax = 40
Image: Complete (65-256 mm) [12 pts]       Image: State	
Image: SAND (<2 mm) [6 pts]	27
Total of Percentages of (A) (A)	A+B
Bidr Siabs, Boulder, Cobble, Bedrock <u>~6578</u> (A) SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES:	
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check O/VL Yone box):	of Depth lax = 30
> 30 centimeters (20 pts)       > 5 cm - 10 cm [15 pts]         > 22.5 - 30 cm [30 pts]       < 5 cm [5 pts]	
□ > 10 - 22.5 cm (25 pts) □ NO WATER OR MOIST CHANNEL (0 pts)	$\bigcirc$
COMMENTSMAXIMUM POOL DEPTH (centimeters):	
	Bankfull
	Width f <u>ax=30</u>
> 1.5 m - 3.0 m (> 9'7" - 4'8") [20 pts]	200
COMMENTS and march and narrow AVERAGE BANKFULL WIDTH (motors) 14	$\mathcal{D}$
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY おNOTE: River Left (L) and Right (R) as looking downstreamな	
RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Most Predominant per Bank) L R	į
L R (Most Predominant per Bank) L R D Wide >10m D D Mature Forest, Wetland D Conservation Tillage	
Moderate 5-10m     GO immature Forest, Shrub or Old     DO     Urban or Industrial     Field	
Open Pasture, Row	
Image: Comparison of the company o	
COMMENTS	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):	
Subsurface flow with isolated pools (interstitial) Ory channel, no water (Ephemeral)	
COMMENTS	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None II.0 II.0 II.0 II.0 II.0	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
🗇 Fiat (0.5 sv100 m) 🔲 Fiat to Moderate 💭 Moderate (2 sv100 m) 😡 Moderate to Severe 💭 Severe (10 sv100 m)	

	<u>(S+1-2</u>
ADDITIONAL STREAM INFORMATION (This Information Must Also be	Completed):
QHEI PERFORMED? - TYes TNo QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
O wwwH Name:	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIR	E WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

C CWH Name:	Distance from Evaluated Stream
EWH Name:	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHE	ED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: New Harron, WV-OH NRCS Soil Map	Page: NRCS Soil Map Stream Order
County: Township / City:	etart Falls, Ohio area
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation:	Quantity: um hamm
Photograph Information:	
Photograph Information:	trees have leaves)
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id	and attach results) Lab Number:
Field Measures: Temp (*C) Dissolved Oxygen (mg/l) pH (S.U.)	Conductivity (umhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, please explain:	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Voucher collections option ID number. Include appropriate field data sheets from the I	nat. NOTE: all voucher samples must be labeled with the sile Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinverteb	Voucher? (Y/N) rates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	•
DRAWING AND NARRATIVE DESCRIPTION OF STREAM	
Include important landmarks and other features of interest for site evaluation	SUG & HEHRING RESCHARM OF THE STREAM S ROCATION
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PHWH Form Page - 2

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October 24, 2002 Revision

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<b>HHEI Sco</b>	ore (sum	of metrics	1. 2	3)	:	
	ala famili	. AL HIARIAG				

Class II

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SITE NAME/LOCATION AMP - OH		DRAINAGE AREA (mi²)	
LENGTH OF STREAM REACH (R)L	AT LONG	RIVER CODE RIVER MILE	
DATE 11/30/05 SCORER MOL			
NOTE: Complete All Items On This Form			
STREAN CHANNEL ONNE / NATU MODIFICATIONS:	RAL CHANNEL DRECOVERED		OVERY
(Max of 32). Add total number of significant TYPE BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts] BEDROCK [16 pt] COBBLE (65-256 mm) [12 pts] GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts] Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock	Al substrate types found (Max of 8). Find the substrate type found (Max of 8). Find the substrate ty	KWOODY DEBRIS [3 pts]     IO       RITUS [3 pts]     IO       ARDPAN [0 pt]     IO       L [3 pts]     IO	HHE! Metric Points Substrate Max = 40 QQ
SCORE OF TWO MOST PREDOMINATE SUBST	RATE TYPES:	L NUMBER OF SUBSTRATE TYPES:	
2. Maximum Pool Depth (Measure the maximum Pool Depth (Measur	culverts or storm water pipes) (Che	10 cm [16 pts] pts] ER OR MOIST CHANNEL [0 pts]	Pool Depth Max = 30
3. BANK FULL WIDTH (Measured as the a → 4.0 meters (> 13') [30 pts] → 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	- <b>⊠</b> > 1.0 m -	(Check ONLY one box): 1.5 m (> 3' 3" - 4' 8") [15 pts] < 3' 3") [5 pts]	Bankfuli Width Max=30
COMMENTS	AVI	ERAGE BANKFULL WIDTH (meters)	
RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH	This information <u>must</u> also be AIN QUALITY ☆NOTE: River Le FLOODPLAIN QUALITY	completed eft (L) and Right (R) as looking downstreams?	
	<ul> <li>R (Most Predominant per B Mature Forest, Wetland Immature Forest, Shrub Field</li> <li>Residential, Park, New F</li> </ul>	or Cld Conservation Tillage	1
	iation) (Check ONLY one box):	oist Channel, <b>isolated</b> pools, no flow (intermitten ry channel, no water (Ephemeral)	
SINUOSITY (Number of bends pe None 0.5	ar 61 m (200 ft) of channel) (Check ( 1.0 0 2.0 1.5 0 2.5	<b>Q</b> 3.0	
STREAM GRADIENT ESTIMATE		Moderate to Severe 10 to	100 ft)

	<u>CS-2</u>
DDITIONAL STREAM INFORMATION (This Information Must Also b	be Completed):
	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
] WWH Name:	
] CWH Name:	Distance from Evaluated Stream
· · ·	IRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: New Harron, WV-OH	
County: M-Pigs Townsh	10/City: Retart Falle, Ohioanea
MISCELLANEOUS	, ,
Base Flow Conditions? (Y/N): Date of last precipitation:	aglus annus ha ann
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% open):	
Were samples collected for water chemistry? (Y/N): $\underline{\mathcal{N}}_{}$ (Note lab s	sample no. or id. and attach results) Lab Number;
Field Measures: Temp (*C)Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity (umhos/cm)
Is the sampling reach representative of the stream (Y/N) Y If not, p	
ια απηλείται το μαραγικό το μαραγικά το της Σαμαρικής το της βαραγικής το της μαραγικής το της παραγικής της πα Τη ποτέξει	wase explaint
	mbered they in charmed
Additional manager of the second state of the first second state of the second state o	hubblit litter to C utherer 1
Additional comments/description of pollution impacts: 11900	
Head UK storem int of by BIOTIC EVALUATION	ATV Area , I.
Head       UK       Station         BIOTIC EVALUATION         Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) served? (Y/N) Voucher? (Y/N)
HPAD       UK       Station         BIOTIC EVALUATION         Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) served? (Y/N) Voucher? (Y/N)
Head       UK       Station         BIOTIC EVALUATION         Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) served? (Y/N) Voucher? (Y/N)
HPAD       UK       Station       Station <td< td=""><td>collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) served? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)</td></td<>	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) served? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) served? (Y/N) Voucher? (Y/N)
HPAD OF Station (with off by         BIOTIC EVALUATION         Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assassment Manual) iserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed):
HPAD OF Station (with off by         BIOTIC EVALUATION         Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assassment Manual) iserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed):
HPAD OF Station (with off by         BIOTIC EVALUATION         Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) served? (Y/N) Voucher? (Y/N) to Macroinvertebrates Observed? (Y/N) Voucher? (
HPAD OF Station (with off by         BIOTIC EVALUATION         Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) served? (Y/N) Voucher? (Y/N) to Macroinvertebrates Observed? (Y/N) Voucher? (
HPAD OF Station (with off by         BIOTIC EVALUATION         Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) served? (Y/N) Voucher? (Y/N) to Macroinvertebrates Observed? (Y/N) Voucher? (
Head of statem (in the AF by BKOTIC EVALUATION Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assassment Manual) iserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) OF STREAM REACH (This must be completed):
Head of statem (in the AF by BKOTIC EVALUATION Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) served? (Y/N) Voucher? (Y/N) to Macroinvertebrates Observed? (Y/N) Voucher? (
Head of statem (int all by BIOTIC EVALUATION Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) iserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Vouch
Head of statem (in the AF by BKOTIC EVALUATION Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) iserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Vouch
Head of statem (int all by BIOTIC EVALUATION Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) iserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Vouch
Head of statem (int all by BIOTIC EVALUATION Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) iserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Vouch
Head of statem (in the of the by BNOTIC EVALUATION Performed? (Y/N):	collections optional. NOTE: all voucher samples must be labeled with the site sheets from the Primary Headwater Habitat Assessment Manual) iserved? (Y/N) Voucher? (Y/N) c Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Vouch

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Class II

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	HHEI Score (s	um of metrics 1, 2, 3) : $4 + 7$
SITE NAME/LOCATION AMP-OH		
	3-1 RIVER BASIN	
LENGTH OF STREAM REACH (R) L DATE JAJ NOTE: Complete All Items On This Form	COMMENTS	
	/	
	RAL CHANNEL DRECOVERED DRECOV	ERING DRECENT OR NO RECOVERY
MODIFICATIONS:		ې غ
(Max of 32). Add total number of significan TYPE PEI BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts]		The provided HTML for the second sec
evaluation. Avoid plunge pools from road ( > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts]	cimum pool depth within the 61 meter (200 ft) e culverts or storm water pipes) (Check ONL Y on 55 cm - 10 cm [15 pts 5 cm [6 pts] NO WATER OR MOIS A flormer for the MAXIMUM POO	e box): ] T CHANNEL [0 pts]
3. BANK FULL WIDTH (Measured as the a → 4.0 meters (> 13') [30 pts] → 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	verage of 3-4 measurements) (Check ( > 1.0 m - 1.5 m (> 3' 3" = 1.0 m (≤ 3' 3') [5 pts]	DNL Yone box): Bankfuli - 4' ס") (15 pts] Width
	AVERAGE BAN	
<b>RIPARIAN ZONE AND FLOODPL</b> <u>RIPARIAN WIDTH</u>	This information <u>must</u> also be completed AIN QUALITY GNOTE: River Left (L) and Ri FLOODPLAIN QUALITY	ght (R) as looking downstreamជា
L R (Per Bank)	L R (Most Predominant per Bank)	L R D D Conservation Tillage
□ □ Wide >10m	Mature Forest, Wetland	•
Moderate 5-10m	Field	Urban or Industrial
Narrow <5m     None     COMMENTS	Residential, Park New Field     Fenced Pasture	Open Pasture, Row     Crop     Mining or Construction
FLOW REGIME (At Time of Evalue Stream Flowing Subsurface flow with isolated pools COMMENTS	Moist Channel	isolated pools, no flow (Intermittent) o water (Ephemersi)
SINUCSITY (Number of bends pe None D 0.5 D	r 61 m (200 ft) of channel) (Check ONLY one bo 1.0 2.0 1.5 2.5	x): 3.0 >3
STREAM GRADIENT ESTIMATE	Moderate (2 (1/100 ft) OModerate to	Severe 🔲 Severe (10 stribo nj

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			CS-3-1
DDITIONAL STREAM INFORM	NTION (This Information Must Also be Co	ompleted):	
QHEI PERFORMED? -	Ves Ø No QHEI Score	_ (If Yes, Attach Completed QHEI Form)	
DOWNSTREAM DESIG			
		Distance from Evaluated Stre	
DEWH Name:		Distance from Evaluated Stre	
			-
MAPPING: ATTACH CO	PIES OF MAPS, INCLUDING THE <u>ENTIRE</u> V	WATERSHED AREA. CLEARLY MARK THE SI	TE LOCATION
ISGS Quadrangle Name: <u>New</u>	-Karen, WU-OH NRC	CS Soil Map Page: NRCS Soil Map \$	Stream Order
county: Margo	Township / (	city: Letart Falls, O	tio area
MISCELLANEOUS		,	
	Date of last precipitation: 11/5	R1/05 Quantity: untron	n
Photograph Information:	<u></u>		
Elevated Turbidity? (Y/N): <u> </u>	Canopy (% open):		
Were samples collected for water	chemistry? (Y/N): (Note lab samp	ele no. or id. and attach results) Lab Number:	
Field Measures: Temp (*C)	Dissolved Oxygen (mg/l)	_pH (S.U.) Conductivity (umhos/cn	n)
is the sampling reach representati	ve of the stream (Y/N) / If not, please	e explain:	
Additional comments/description of	of pollution impacts:		
BIOTIC EVALUATION	·····		•
Performed? (Y/N): <u>N</u> (If	Yes, Record all observations. Voucher collect	ctions optional. NOTE: all voucher samples mu Is from the Primary Headwater Habilat Assessm	
Frogs or Tadpoles Observed? (Y/		red? (V/N) Voucher? (V/N) croinvertebrates Observed? (V/N) Vouc ad ma (Connect) observed	
DRAWING AND	NARRATIVE DESCRIPTION OF	STREAM REACH (This must be co	
Include important landma	ks and other features of interest for site	evaluation and a narrative description of th	e stream's location
and a	A pic	BEW-N7'	kilow
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Ontobar 24 2802 Busirian	PHWH Form	rage - Z	

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HHEI SCOre (sum of metrics 1, 2, 3) :

Class III

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58

SITE NAME/LOCATION AMP-OH	
SITE NUMBER <u>CS - 3-2</u> RIVER BASIN DRAINAGE AREA (mi <sup>2</sup> )	
LENGTH OF STREAM REACH (II) <u>900</u> LAT. LONG. RIVER CODE RIVER MILE DATE <u>11/30/05</u> SCORER <u>INBL</u> COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruc	tions
STREAM CHANNEL ONONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVER MODIFICATIONS:	ERY
<ol> <li>SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A &amp; B.</li> </ol>	HHEI
TYPE PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts]         3         SiLT [3 pt]         3           BOULDER (>256 mm) [16 pts]         0         LEAF PACKWOODY DEBRIS [3 pts]         10	Points
	Substrate Max = 40
XII     COBBLE (65-256 mm) (12 pts)     XII     CLAY or HARDPAN [0 pt]       II     GRAVEL (2-64 mm) [9 pts]     II     MUCK [0 pts]	~
Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state       Image: Second state     Image: Second state     Image: Second state     Image: Second state	2
Total of Percentages of (A)	A+B
Bidr Slabs, Boulder, Cobble, Bedrock	<b>~~</b>
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box);	'ool Depth Max = 30
□       > 30 centimeters [20 pts]         □       > 22.5 - 30 cm [30 pts]	5
> 10 - 22.5 cm [26 pts]	
COMMENTSMAXIMUM POOL DEPTH (centimeters):	
	Bankfuli
└ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] □ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] □ ≤ 1.0 m (< 3' 3") [6 pts]	Width Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	20
COMMENTSAVERAGE BANKFULL WIDTH (meters)	20
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY がNOTE: River Left (L) and Right (R) as looking downstream☆	
RIPARIAN WIDTH     ELOODPLAIN QUALITY       LR     (Most Predominant per Bank)	
R       (Per Bank)       L       R         Mode >10m       Mature Forest, Wetland       D       Conservation Tillage	
Moderate 5-10m     Immature Forest, Shrub or Old     D     Urban or Industrial     Field	
D Narrow <5m D D Residential, Park, New Field D Open Pasture, Row	
Image: Crop     Image: Crop       Image: Crop <td></td>	
COMMENTS	
<b>FLOW REGIME</b> (At Time of Evaluation) (Check ONLY one box): $\Delta$ Stream Flowing $\Box$ Moist Channel, isolated pools, no flow (Intermittent)	
Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check OVLY one box):	
🛛 Flat (0.5 w100 n) 🖉 Elat to Moderate 🔲 Moderate (2 fw100 li) 🔲 Moderate to Severe 💭 Severe (10 lw100 n	4)

	LJ-J-d
DITIONAL STREAM INFORMATION (This Information Must Also be Com	ipleted):
QHEI PERFORMED? - DYes No QHEI Score (II	f Yes, Attach Completed QHEI Form)
DOWNSTREAM DESKINATED USE(S)	
WWH Name:	
CWH Name:	
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WA	TERSHED AREA, CLEARLY MARK THE SITE LOCATION
GS Quadrangle Name: New Harron, WV-OH NRCS:	Soil Map Page: NRCS Soil Map Stream Order
unty: Township / City	, Letant Falls, Ohio area
Inty: Township / City	- Actorise Crouse, Course and
MISCELLANEOUS	C
se Flow Conditions? (Y/N): $f$ Date of last precipitation: $11/39/2$	D quantity: unkerrown
• •	
wated Turbidity? (Y/N): Canopy (% open):	
re samples collected for water chemistry? (Y/N): 10 (Note lab sample	no. or id. and attach results) Lab Number:
	H (S.U.) Conductivity (µmhos/cm)
he sampling reach representative of the stream (Y/N) If not, please e	splain:
ditional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	ons optional. NOTE: all voucher samples must be labeled with the site
	from the Primary Headwater Habitat Assessment Manual)
h Observed? (Y/N) Voucher? (Y/N) Salamanders Observed' ogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macro	
mments Regarding Biology:	
magno rogotorg pology	
	A
DRAWING AND NARRATIVE DESCRIPTION OF ST	IREAM REACH (This must be completed):
Include important landmarks and other features of interest for site eva	
t lan l	A to ATV trail
1 guilty between for st	ichle à
gun fan on	K That =
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	home of the to
water of	
	and the second sec
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er 24, 2002 Revision

Acr 11 beech/oak with strub/1112 havysuite tangles

1

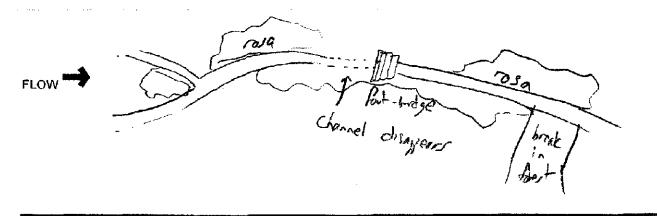
modified class I
Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3): 34
SITE NAME/LOCATION AMI - OH
LENGTH OF STREAM REACH (#) LAT LONG RIVER CODE RIVER MILE
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions
STREAM CHANNEL ON NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY MODIFICATIONS:
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.
TYPE     PERCENT     TYPE     PERCENT     Metric       I I BLDR SLABS (16 pts)     I I I I I I I I I I I I I I I I I I I
BLDR SLABS [16 pts]       24. Silt [3 pt]       36. Foints         BOULDER (>256 mm) [16 pts]       10       LEAF PACK/WOODY DEBRIS [3 pts]       15
BEDROCK [16 pt]     BEDROCK [16 pt]     Substrate
Total of Percentages of (A) (B) (A A+B Bidr Slabs, Boulder, Cobble, Bedrock
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of Pool Depth
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):     Max ≠ 30
> 30 centimeters [20 pts]     > 5 cm - 10 cm (15 pts)       > 22.5 · 30 cm (30 pts)     < 5 cm (6 pts)
> 22.5 · 30 cm [30 pts]          > 10 - 22.5 cm [25 pts]          NO WATER OR MOIST CHANNEL [0 pts]
COMMENTS MAXIMUM POOL DEPTH (centimeters):
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Bankfuli 2 4.0 meters (> 13") [30 pts] Width Width
> ≥ 3.0 m - 4.0 m (> 9'7' - 13') [25 pts] ≤ 1.0 m (≤ 3' 3') [5 pts]
D > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pis]
This information <u>must</u> also be completed
RIPARIAN ZONE AND FLOODPLAIN QUALITY SHOTE: River Left (L) and Right (R) as looking downstreams? <u>RIPARIAN WIDTH</u> <u>FLOODPLAIN QUALITY</u>
R (Per Bank) L R (Most Predominant per Bank) L R
Wide >10m
Field Urban or industrial
Narrow <5m O Residential, Park, New Field O Core Pasture, Row
Image: Construction     Image: Construction       Image: Construction     Image: Construction
COMMENTS
FLOW REGIME (At Time of Evaluation) (Check ONLY one box)
Stream Flowing  Subsurface flow with isolated pools (Interstitial)  COMMENTS No another (Interstitial)  COMMENTS No another (Subsurface Comments)  Subsurface flow with isolated pools (Interstitial)  Subsurface flow with isola
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):
Flat (0.5 W100 ft) Fiat to Moderate (2 W100 ft) Orderate (2 W100 ft) Severe (10 W100 ft)

QHEI PERFORMED? - 🗆 Yes 🕅 No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
] www.iname:	Distance from Evaluated Stream
] CWH Name:	Distance from Evaluated Stream Distance from Evaluated Stream
	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
•	NRCS Soil Map Page: NRCS Soil Map Stream Order
county: <u>Meigs</u> Tow	inship/city: Letart Falls, Ohio area
ے MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation:	1/20/05 unham
· •	
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% open):	2_
	ab sample no. or id. and attach results) Lab Number:
	pH (S.U.) Conductivity (µmhos/cm)
is the sampling reach representative of the stream (Y/N) If no	ol, please explain:
·····	<u></u>
Additional comments/description of pollution impacts: Wooded	valley between 2 row-crop helds
	1
BIOTIC EVALUATION	
	her collections optional. NOTE: all voucher samples must be labeled with the late sheets from the Primary Headwater Habilat Assessment Manual)
	Observed (VBI) Vousborg (VBB
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqu	Jatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)

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#### DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include Important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



HHEI Score (sum of metrics 1, 2, 3) : 97

Class III

SITE NAME LOCATIONAMP - OH				·····
SITE NUMBER <u>CS</u>				
LENGTH OF STREAM REACH (ft)	AT LONG		RIVER MILE	
DATE 11/30/0-5 SCORER JAV				
NOTE: Complete All Items On This Form	- Refer to "Field Evaluation Ma	nual for Ohio's PHWH S	Streams" for Instru	ctions
			ECENT OR NO RECON	VERY
MODIFICATIONS:				
1. SUBSTRATE (Estimate percent of every (Max of 32). Add total number of significar		· _··		HHEI Metric
BLDR SLABS [16 pts]			5%	Points
BOULDER (>256 mm) [16 pts]		KWOODY DEBRIS [3 pts]	_5%_	Substrate
BEDROCK [16 pt]		RITUS <b>(3 pts)</b> ARDPAN <b>(0 pt)</b>		Max = 40
GRAVEL (2-64 mm) [\$ pts]		• • •		$\sim$
SAND (<2 mm) [6 pts]	5% 00 ARTIFICIA	L [3 pts]		32
Total of Percentages of	(A07, (A)		(8)	A+B
Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock	<u>a</u> as		+	<u>, , , , , , , , , , , , , , , , , , , </u>
SCORE OF TWO MOST PREDOMINATE SUBST	RATE TYPES: ************************************	L NUMBER OF SUBSTRAT	E TYPES:	
2. Maximum Poot Depth (Measure the max			at the time of	Pool Depth
evaluation. Avoid plunge pools from road > 30 centimeters [20 pts]		eck ONLY one box): 10 cm [15 pts]	Ìr	<u>Max = 30</u>
□ / > 22.5 - 30 cm [30 pts]	🖸 < 5 cm [5	pts]		25
▶ > 10 - 22.5 cm [25 pts]		ER OR MOIST CHANNEL [0	ob.5	
COMMENTS	MA	XIMUM POOL DEPTH (cen	timeters):	
3 BANK FULL WIDTH (Measured as the a	verage of 3-4 measurements)	(Check ONLY one box)		Bankfull
→ 4.0 meters (> 13') [30 pts] ↓ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	□ > 1.0 m · □ ≤ 1.0 m (:	1.5 m (> 3' 3" - 4' 8") [15 pts]		Width Max=30
I 5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		2 2 ) [5 bts]		
COMMENTS			~1821	20
CONNER (3	AV	ELARE DAMALLAFE 4410 HU	i (marara)	
RIPARIAN ZONE AND FLOODPL <u>RIPARIAN WDTH</u>	This information <u>must</u> also be AIN QUALITY INOTE: River L FLOODPLAIN QUALITY	completed eft (L) and Right (R) as looki	ng downstreamដ	
L R (Per Bank)	L R (Most Predominant per B			
	Mature Forest, Wetland	or Old en en	onservation Tillage	
Moderate 5-10m	Field		rban or industrial	
D D Narrow <5m	🔲 🗹 – Residential, Park, New F	1860 - 1919 - 1	pen Pasture, Row	
D D None	D D Fenced Pasture		ining or Construction	
COMMENTS	·····		. <u></u>	
FLOW REGIME (At Time of Evalue Stream Flowing Subsurface flow with isolated pools COMMENTS	Q M	oist Channel, isolated pools, ry channel, no water (Epher	• •	
SINUOSITY (Number of bends pe	r 61 m (200 ft) of channel) (Crieck ( 1.0 - 2.0 1.5 - 2.5		3.0 >3	
STREAM GRADIENT ESTIMATE				

PHWH Form Page - 1

CS-4-2

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MISCELLANEOUS         lase Flow Conditions? (Y/N): $Y$ Date of last precipitation: $11/29/05$ Quantity: $whmaw$ Photograph Information: $YRA$ Photograph Information: $YRA$ Stevated Turbidity? (Y/N): $N$ Canopy (% open): $\sim 40\%$ Vere samples collected for water chemistry? (Y/N): $N$ (Note lab sample no. or id. and attach results) Lab Number:			is, Attach Completed QHEI Form)	
Diver Name:				
Detailed from Evaluated Stream				
MAPPING: ATTACH COPES OF MAPS, INCLIDING THE ENTERS WATERSHED AREA. CLEARLY MARK THE STEL LOCATION         ISGS Quadrangie Mane.       MALT       MARCA       MICS Self Map Stream Order         Soundy:       Marga       Township / C4y.       Township / C4y.       Township / C4y.         INISCELLANEOUS       INISCELLANEOUS       Iniscellaneous       11/24/25       Quantity       Output         INISCELLANEOUS       Iniscellaneous       11/24/25       Quantity       Initomation:       11/24/25         Issee Flow Conditions?       (YRH)       Date of last precipitation:       11/24/25       Quantity       Initomation:         Issee Flow Conditions?       (YRH)       Date of last precipitation:       11/24/25       Quantity       Initomation:         Issee Flow Conditions?       (YRH)       Canopy (% open):       11/24/25       Quantity       Initomation:         Issee Townee       Temps:       Canopy (% open):       11/24/25       Quantity       Initomation:         Issee Samples collocided for water chamility?       (YRI):       Canopy (% open):       11/24/25       Quantity       Initomation:         Issee Samples collocided for water chamility?       (YRI):       Disolved Corgen (% open):       PHC2       Conductivity (iminoater)         Issee samples collocided for water chamility? <t< td=""><td></td><td></td><td></td><td></td></t<>				
ISGS Cuidnangle Name:       NEW HANCON, WU-OHNICS Soit Map Page:       INCS Soit Map Stream Order         County:       Macga       Township / City:       Attact Ffalled, Olive and	JEWH Name:		Distance from Evaluated Stream	
Double       Township / Cer.       A start Falls, Ohio and         BISCELLANEOUS       Biscellaneous       11/24/05       Quantity: who during:         Bisse Flow Conditions? (VM); L       Date of last precipitation:       11/24/05       Quantity: who during:         Photograph Information:	<b>A</b> .			
HISCELLAREOUS         Issee Flow Conditions? (YA): Date of last precipitation:				
Issee Flow Conditions? (YM): Date of test precipitation: 11/29/05 Ouentity:	county: Meigh	Township / City:	hetart Falls, Ohio are	a
holograph kitomation:	MISCELLANEOUS			
<pre>stevated Turbidity? (YAN): Canopy (% open):</pre>	ase Flow Conditions? (Y/N):	Date of last precipitation: 11/29/05	S Quantity: untrawn	
Were samples collected for water chemistry? (YM):	Photograph Information:			
ield Measures:       Temp (*C)	Elevated Turbidity? (Y/N):	Canopy (% open): ~ 408	-	
s the sampling reach representative of the stream (Y/N) If not, please explain:	Vere samples collected for water chem	ilstry? (Y/N): Note lab sample no.	or id. and attach results) Lab Number:	
Idditional comments/description of pollution impacts:         BIOTIC EVALUATION         Performed? (YN):	ield Measures: Temp (*C)	Dissolved Oxygen (mg/l) pH.(S	.U.) Conductivity (µmhos/cm)	<u>_</u> _
Idditional comments/description of pollution impacts:         BIOTIC EVALUATION         Performed? (YN):	the <b>campling</b> reach representative of		sins-	
BIOTIC EVALUATION         Performed? (Y/N):			ar ( ).	
BIOTIC EVALUATION         Performed? (Y/N):	······	·····		
Performed? (YR):	Additional comments/description of poll	ution impacts:	· · · · · · · · · · · · · · · · · · ·	
Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location at the recent date of the stream's location of the stream's location at the recent date of the stream's location		Record all observations. Voucher collections	aslight. NOTE: all unurbar samples must be laboled with th	ha cita
Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location at the recent date of the stream's location of the stream's location at the recent date of the stream's location	Performed? (Y/N): (If Yes, ID numi Fish Observed? (Y/N) Vouche Frogs or Tadpoles Observed? (Y/N)	ber. Include appropriate field data sheets from er? (Y/N) Salamanders Observed? (Y Voucher? (Y/N) Aquatic Macroinve	the Primary Headwaler Habitat Assessment Manual) (N)_i Voucher? (Y/N) ertebrates Observed? (Y/N) Voucher? (Y/N)	he sile
Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location at the recent date of the stream's location of the stream's location at the recent date of the stream's location	Performed? (Y/N): (If Yes, ID numi Fish Observed? (Y/N) Vouche Frogs of Tadpoles Observed? (Y/N)	ber. Include appropriate field data sheets from er? (Y/N) Salamanders Observed? (Y Voucher? (Y/N) Aquatic Macroinve	the Primary Headwaler Habitat Assessment Manual) (N)_i Voucher? (Y/N) ertebrates Observed? (Y/N) Voucher? (Y/N)	he site
Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location at the recent date of the stream's location of the stream's location at the recent date of the stream's location	Performed? (Y/N): (If Yes, ID numi Fish Observed? (Y/N) Vouche Frogs or Tadpoles Observed? (Y/N)	ber. Include appropriate field data sheets from er? (Y/N) Salamanders Observed? (Y Voucher? (Y/N) Aquatic Macroinve	the Primary Headwaler Habitat Assessment Manual) (N)_i Voucher? (Y/N) ertebrates Observed? (Y/N) Voucher? (Y/N)	he site
Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location at the recent date of the stream's location of the stream's location at the recent date of the stream's location	Performed? (Y/N): (If Yes, ID numi Fish Observed? (Y/N) Vouche Frogs of Tadpoles Observed? (Y/N)	ber. Include appropriate field data sheets from er? (Y/N) Salamanders Observed? (Y Voucher? (Y/N) Aquatic Macroinve	the Primary Headwaler Habitat Assessment Manual) (N)_i Voucher? (Y/N) ertebrates Observed? (Y/N) Voucher? (Y/N)	the site
the -> here -2" dett-30 montule wooded/scrub shult wooded/scrub shult 1 well - and 1 well - and	Performed? (Y/N): (If Yes, ID numi Fish Observed? (Y/N) Vouche Frogs or Tadpoles Observed? (Y/N) Comments Regarding Biology:	ber. Include appropriate field data sheets from er? (Y/N) Satamanders Observed? (Y Voucher? (Y/N) Aquatic Macroinve	he Primary Headwater Habitat Assessment Manual) //N)_i Voucher? (Y/N) ertebrates Observed? (Y/N) Voucher? (Y/N)	he site
tiller ter 2" dett- 30 montule m	Performed? (Y/N): (If Yes, ID numi Sish Observed? (Y/N) Vouche Progs or Tadpoles Observed? (Y/N) Comments Regarding Biology DRAWING AND NAT	ber. Include appropriate field data sheets from ar? (Y/N) Satamanders Observed? (Y Voucher? (Y/N) Aquatic Macroinve Aquatic Macroinve RRATIVE DESCRIPTION OF STRI	a the Primary Headwaler Habitat Assessment Manual) //N)_i: Voucher? (Y/N) Priebrates Observed? (Y/N) Voucher? (Y/N) EAM REACH (This must be completed):	
Low - 2" dath - 30 montule wooded/scrub shult Tudy and	Performed? (Y/N): (If Yes, ID numi Sish Observed? (Y/N) Vouche Progs or Tadpoles Observed? (Y/N) Comments Regarding Biology: DRAWING AND NAI	ber. Include appropriate field data sheets from ar? (Y/N) Satamanders Observed? (Y Voucher? (Y/N) Aquatic Macroinve Aquatic Macroinve RRATIVE DESCRIPTION OF STRI ad other features of interest for site evalue	the Primary Headwaler Habitat Assessment Manual) (N) Voucher? (Y/N) ertebrates Observed? (Y/N) Voucher? (Y/N) EAM REACH (This must be completed): ation and a narrative description of the stream's location	
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ne -) begar - 2" dath - 3" d montule wooded/scent shult	Performed? (Y/N): (If Yes, ID numi Fish Observed? (Y/N) Vouche Frogs or Tadpoles Observed? (Y/N) Comments Regarding Biology: DRAWING AND NAI Include important landmarks an	ber. Include appropriate field data sheets from r? (Y/N) Satamanders Observed? (Y Voucher? (Y/N) Aquatic Macroinve Aquatic Macroinve RRATIVE DESCRIPTION OF STRI nd other features of interest for site evalue by obtaind	the Primary Headwaler Habitat Assessment Manual) (N) Voucher? (Y/N) ertebrates Observed? (Y/N) Voucher? (Y/N) EAM REACH (This must be completed): ation and a narrative description of the stream's location	
me - 2" dett-3" dett-3"	Performed? (Y/N): (If Yes, ID numi Fish Observed? (Y/N) Vouche Frogs or Tadpoles Observed? (Y/N) Comments Regarding Biology: DRAWING AND NAI Include important landmarks an	ber. Include appropriate field data sheets from r? (Y/N) Satamanders Observed? (Y Voucher? (Y/N) Aquatic Macroinve Aquatic Macroinve RRATIVE DESCRIPTION OF STRI nd other features of interest for site evalue by obtained	the Primary Headwaler Habitat Assessment Manual) (N) Voucher? (Y/N) ertebrates Observed? (Y/N) Voucher? (Y/N) EAM REACH (This must be completed): ation and a narrative description of the stream's location	
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modified class

HHEI Score (sum of metrics 1, 2, 3) AMP-OH SITE NAME/LOCATION SITE NUMBER CS - 5 - 2 RIVER BASIN DRAINAGE AREA (mi<sup>2</sup>) LENGTH OF STREAM REACH (ft) LONG. RIVER CODE RIVER MILE LAT. 130105 SCORER JAV \_\_\_COMMENTS DATE 1/ NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions INONE / NATURAL CHANNEL I RECOVERED RECOVERING RECENT OF NO RECOVERY STREAM CHANNEL **MODIFICATIONS:** SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. PERCENT Туре Ф С BLDR SLABS [16 pts] SILT [3 pt] 00 BOULDER (>256 mm) [16 pts] LEAF PACK/WOODY DEBRIS [3 pts] BEDROCK [16 pt] 00 FINE DETRITUS [3 pts] סס COBBLE (65-256 mm) [12 pts] CLAY or HARDPAN [0 pt] 00 GRAVEL (2-64 mm) [9 pts] MUCK [0 pts] <u>,</u> 9 00 Ο SAND (<2 mm) [6 pts] ARTIFICIAL [3 pts] Total of Percentages of (B) 2 Bidr Slabs, Boulder, Cobble, Bedrock TOTAL NUMBER OF SUBSTRATE TYPES: Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 5 cm - 10 cm [15 pts] > 30 centimeters [20 pts]  $\mathbf{\Theta}$ > 22.5 - 30 cm [30 pts] < 5 cm [5 pts] 1 > 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts] COMMENTS MAXIMUM POOL DEPTH (centimeters): BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (> 13') [30 pts] Ø > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (≤ 3' 3") [5 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 6") [20 pts] AVERAGE BANKFULL WIDTH (meters) COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY \$PNOTE: River Left (L) and Right (R) as looking downstreams **RIPARIAN WIDTH** FLOODPLAIN QUALITY (Per Bank) (Most Predominant per Bank) L R LR a 00 ПС Wide >10m П Mature Forest, Welland **Conservation Tillage** Immature Forest, Shrub or Old Ø Ø MI 00 Moderale 5-10m Urban or Industrial Field Open Pasture, Row 00 00 Narrow <5m Residential, Park, New Field Cróp 00 00 None 00 Fenced Pasture Mining or Construction COMMENTS

HHEI Metric TYPE Points 00 Substrate 00 Max = 40 00 00 00 4 + R SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 2. Pool Depth Max # 3D Ο Ο Baskfull П Width Ο <u> Max=30</u> п FLOW REGIME (A! Time of Evaluation) (Check ONLY one box): Moist Channel, isolated pools, no flow (Intermittent) Stream Flowing П Ō Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral) COMMENTS SINUOSITY (Number of bends per,61 m (200 ft) of channel) (Check ONLY one box): п 8 None 1.0 2.0 3.0 Ο ٥ 0.5 1.5 2.5 23 STREAM GRADIENT ESTIMATE Moderate (2 IV100 ft) D Moderate to Severe Severe (10 m/100 ft) Flat (0.6 n/ 100 m) Flat to Moderate PHWH Form Page - 1

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CWH Name:	DDITIONAL STREAM INFORMATION (This Information Must Also be Comple	etedi:
JWM Name:	QHEI PERFORMED? - 🗍 Yes 🖉 No QHEI Score (If Ye	as, Attach Completed QHEI Form)
B VAN Hame:       Distance from Evaluated Stream         DEVAN Hame:       Distance from Evaluated Stream         DEVAN Hame:       Distance from Evaluated Stream         MAPPING: ATTACH COPIES OF MAPS, INCLUOMING THE ENTITIE WATERSHED AREA. CLEARLY MARK THE BITE LOCATION         SGS Cluadrangle Neme:       NEW MOREAL, U/J-OH NRCS Soil Map Depe:         MISCELLANEOUS         same:	DOWNSTREAM DESIGNATED USE(S)	
Detwines from Evaluated Stream		
MAPPINS: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION SGS Quadrangle Name: <u>New Howert</u> , <u>WU-OH</u> NRCS Sol Map Page: NRCS Sol Map Sheem Order ounly: <u>Maya</u> Township / City. <u>Astact Fralle</u> , <u>Christance</u> MIGCELLANEOUS see Flow Conditions? (VIN): <u></u> Date of last precipitation: <u>U/29/05</u> Quartity: <u>unknewn</u> holograph information: <u></u> jeveled Turbidity? (VIN): <u></u> Cancepy (% apan): <u>4072</u> , were samples collected for water chamistry? (VIN): <u></u> (Note lab sample no. or id. and ettach results) Lab Number: 		
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outly:	· · · · · · · · · · · · · · · · · · ·	
MISCELLANEOUS         ase Flow Conditions? (V/N): Date of last precipitation:		
ase Flow Conditions? (Y/N): Y Date of last precipitation: 11/29/05 Quantity: unknown hotograph information:	Sounty: Township / City:	Letart Fallo, Chioarea
hotograph Information:		
lavaled Turbidity? (Y/N):	Jase Flow Conditions? (Y/N): $\underline{Y}$ Date of last precipitation: $\underline{11/29/0.5}$	Quantity: unknown
were samples collected for water chemistry? (YAN): ↓ (Note lab sample no. or id. and attach results) Lab Number:         iaid Measures:       Temp (*C)	Photograph Information:	
ield Measures:       Temp (*C)	Elevated Turbidity? (Y/N): Canapy (% apen):409.	
s the sampling reach representative of the stream (Y/N) ⊥ if not, please explain: <u>a angrufu cant pertion</u> <u>bf the arm each has</u> <u>been inpacted by fulling</u> <u>different contents/description of pollution impacts:</u> <u>BOTIC EVALUATION</u> reformed? (Y/N): (if Yes. Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) ish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Comments Regarding Biology: <u>Comments Regarding Biology</u> DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This <u>must</u> be completed): Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location <u>Contents</u> Regarding Biology: <u>Contents</u> Regarding Biology: <u>Contents</u> <u>Contents</u> <u>and</u> <u>Contents</u> <u>Conte</u>	Nere samples collected for water chemistry? (Y/N): (Note lab sample no.	or id. and attach results) Lab Number:
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bf attackmine and has been implacted by fulling idditional comments/description of pollution impacts: BROTIC EVALUATION Performed? (Y/N):	s the sampling reach representative of the stream (Y/N) $\underline{Y^{*}}$ . If not, please expl	an: à significant pertion
BIOTIC EVALUATION         Performed? (Y/N):		
BIOTIC EVALUATION  Performed? (Y/N):	÷ ``	$a \nu = o$
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ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) isch Observed? (Y/N)	BIOTIC EVALUATION	
ish Observed? (Y/N)		
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed): Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location UNDERCEDENCE OF STREAM REACH (This must be completed): Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location UNDERCEDENCE OF Stream of the stream's location UNDERCEDENCE OF	iD number. Include appropriate field data sheets from	n the Primary Headwater Habitat Assessment Manual)
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Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location accuse-abuse wooded BEW-S' We been BEW-S' BE		
LOW - 22' scrub shub brw-s' wooded brw-s' wooded brw-s' wooded brw-s' wooded brw-s' wooded brw-s' wooded brw-s'	DRAWING AND NARRATIVE DESCRIPTION OF STR	EAM REACH (This <u>must</u> be completed):
LOW - 22 wooded BEW-5 wooded BEW-5 wooded BEW-5	•	
LOW - County and the second of		wooded cut 5'
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dum snag BFW P		Share 17
4' syramer	The second	snag and )
4' syran	( J.	U Show I work
	•	L' syron
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Class I

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION			
	NUMBER CS-6 RIVER BASIN		
	LAT. LONG.		
· ·	<u>JAV</u> COMMENTS n This Form - Refer to "Field Evaluat		
•			
STREAM CHANNEL		Vered D Recovering D	RECENT OR NO RECOVERY
(Max of 32). Add total num	ercent of every type of substrate present. Der of significant substrate types found (Max		boxes A & B. HH
TYPE D BLDR SLABS [16 pts]	<u>Percent</u> <u>type</u> vil	T (3 pt)	PERCENT Met 45% Poir
BOULDER (>256 mm)	· · · · <u>· · · · · · · · · · · · · · · </u>	AF PACK/WOODY DEBRIS [3 pts IE DETRITUS [3 pts]	] <u>25%</u> 10% Subst
COBBLE (65-256 mm)	[12 pts]	AY or HARDPAN [0 pt]	1070 Max=
GRAVEL (2-64 mm) [9		CK (0 pts) TIFICIAL (3 pts)	—— IIII
Total of Percentages		HEIGIAL IS HIS!	
Bidr Slabs, Boulder, Cobbie SCORE OF TWO MOST PREDOMI	e, Bedrock <u>07</u> 0 6	TOTAL NUMBER OF SUBSTR	
2. Maximum Pool Depth (Me	esure the maximum pool depth within th	e 61 meter (200 ft) evaluation rea	ch at the time of Pool D
	oois from road culverts or storm water pipes		Max =
22.5 - 30 cm [30 pts]	Ø <	5 cm [6 pts]	5
		O WATER OR MOIST CHANNEL	~1.0/
COMMENTS		MAXIMUM POOL DEPTH (cr	entimeters): •••••••••
3. BANK FULL WIOTH (Mea	sured as the average of 3-4 measurement $\Box \sim >$		
> 3.0 m - 4.0 m (> 9' 7" - 13' > 1.5 m - 3.0 m (> 9' 7" - 4' 8		1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pt 1.0 m (≤ 3' 3") [5 pts]	Max=
			1-2115
COMMENTS		AVERAGE BANKFULL WID	(moters)
	This information must		••••••••••••••••••••••••••••••••••••••
RIPARIAN WIDTI		River Left (L) and Right (R) as loc	King downsiream Fr
L R (Per Bank) □ □ ∕ Wide >10m	L R (Most Predomina		Conservation Tillage
Moderate 5-10m	Immature Forest		Urban or Industrial
DD Narrow <5m	Residential, Parl	New Field	Open Pasture, Row
O O None	G G Fenced Pasture		Crop Mining or Construction
COMMENTS			·····
Stream Flowing	t <i>Time of Evaluation)</i> (Check OIVLY one bo { n isolated pools (Interstitiat)	x): Moist Channel, isolated poo Dry channel, no water (Eph	•
SINUOSITY (Numt None 0.5	ber of bends per 61 m (200 ft) of channel) 1.0 1.5 C	Check ONLY one box):   2.0  2.5	3.0 >3
<u>.</u>			
STREAM GRADIENT EST	IMATE Moderate (2 n/ 100 ii)	Moderate to Severe	Severe (10 #100 #)

	<u> </u>
DDITIONAL STREAM INFORMATION (This information Must Also be C	completed):
DOWNSTREAM DESIGNATED USE(S)	Distance from Evaluated Stream
EWH Name:	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE I	
JSGS Quadrangle Name: New Haven, WV-OH NRC	CS Soil Map Page: NRCS Soil Map Stream Order
County: Meigh Township /	civ Letart Falls Ohioarea
(Unitable )	······································
MISCELLANEOUS	,
Base Flow Conditions? (Y/N): $Y$ Date of last precipitation: $11/2$	9/05 Quantity: untracem
, , , , , , , , , , , , , , , , , , , ,	/
Photograph Information:	
Elevated Turbidity? (Y/N): <u>Y</u> Canopy (% open): <u>707</u>	
Were samples collected for water chemistry? (Y/N): (Note tab samp	ple no. or id. and attach results) Lab Number:
	· · · · · · · · · · · · · · · · · · ·
Field Measures: Temp (*C) Dissolved Oxygen (mg/l)	
Is the sampling reach representative of the stream (Y/N) If not, pleas	æ explain:
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Voucher colle	ections optional. NOTE: all voucher samples must be labeled with the sit
	ets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Salamanders Observ	/ed? (Y/N) Voucher? (Y/N)
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Ma	
Comments Regarding Biology:	
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DRAWING AND NARRATIVE DESCRIPTION OF	STREAM REACH (This <u>must</u> be completed):
Include important landmarks and other features of interest for site	evaluation and a narrative description of the stream's location
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mint series - shub area	rune) of the part of the
(muttillar rose, deer	
- Viller	in the second of the
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T DEN-1	J-1 (c.g. marger) Them
appar - z" his	U-1 (c.g. multiplet) ( u. z" conternation of a sycamore
meltille	
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October 24, 2002 Revision

VILLAL		GUOI				
HHE	Score	(sum o	f metric	s 1,	2, 3	):

modified Class II

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TE NAME/LOCATION AMP - OH				
SITE NUMBER D				
ENGTH OF STREAM REACH (ft)	LAT. LONG.			
NOTE: Complete All Items On This Form				• • •
TREAM CHANNEL	URAL CHANNEL DRECOVE		DRECENT OR NO RECOVE	RY
MODIFICATIONS:		- stream i	a currently recove	mg f
. SUBSTRATE (Estimate percent of ever (Max of 32). Add total number of significa			of boxes A & B.	HHEI
	ERCENT TYPE	A		letric oints
BLDR \$LAB\$ [16 pts]     BOULDER (>256 mm) [16 pts]		3 py PACK/WOODY DEBRIS [3		01110
		DETRITUS [3 pts]	\$	ubstrate lax = 40
COBBLE (65-256 mm) [12 pts]     GRAVEL (2-64 mm) [9 pts]		or HARDPAN [0 pt]	40%	<u></u>
GRAVEL (2-64 mm) [9 pts] SAND (<2 mm) [6 pts]		( [0 pts] FICIAL [3 pts]	2520	0
Bidr Slabs, Boulder, Cobble, Bedrock	3		7	A + B
	IRATE TYPES:	OTAL NUMBER OF SUBSI	RATE TYPES:	<u> </u>
Maximum Pool Depth (Measure the mi				of Depth
evaluation. Avoid plunge pools from road > 30 centimeters [20 pts]		(Check O/VL) one box): m - 10 cm [15 pts]		lax = 30
> 22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts]		m <b>[6 pts]</b> WATER OR MOIST CHANN		5
	·		1/1/1	
		MAXIMUM POOL DEPTH	(centimeters):	ومرافقها الأحفظي
BANK FULL WIDTH (Measured as the		•		Bankfull Width
↓ > 4.0 meters (> 13') [30 pts] ↓ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]		im - 1.5 m (> 3' 3" - 4' 8") [15 )m (≤ 3' 3") <b>[5 pts]</b>		Aax#30
Som (> 9' 7" - 4' 8") [20 pts]				
COMMENTS		_AVERAGE BANKFULL W	1DTH (meters)	
RIPARIAN ZONE AND FLOODF	This Information <u>must</u> als PLAIN QUALITY ট NOTE: Ri	ver Left (L) and Right (R) as	looking downstreams	
RIPARIAN WIDTH	FLOODPLAIN QUALITY L R (Most Predominant	per Bank) L R		
Wide >10m	DD / Mature Forest, Wet	and OO	Conservation Tillage	
Moderate 5-10m	Field	hrub of Old	Urban or Industrial	
D Narrow <5m	DD Residential, Park, N	iew Field	Open Pasture, Row	
O O None	G G Fenced Pasture	00	Crop Mining or Construction	
COMMENTS				
FLOW REGIME (At Time of Eva	luation) (Check ONLY one box)			
Stream Flowing Subsurface flow with isolated poo	ols (Interstitial)	Moist Channel, isolated p Dry channel, no water (B	oools, no flow (Intermittent) Ephemeral)	
CONTRACTO				÷
	er 61 m (200 ft) of channel) (Ct	eck ONLY one box)	_	-
SINUOSITY (Number of bends p	Ter in (coo in or channel) Ter		1	
🖸 None 🗍 🗍	1.0	2.0	<b>3</b> .0	
		2.0 2.5	<b>1</b> >3	

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DOWNSTREAM DESIGNATED USE(S)	
	Distance from Evaluated Stream
CWH Name:	
_) EWH Name:	Distance from Evaluated Stream
	E ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
JSGS Quadrangie Name: <u>New Haven, W-O</u>	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: <u>Meigs</u> To	ownship/city: Letart Falls, Ohio area
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation:	11/29/05 Quantity: unknown
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% open):	40%
Nere samples collected for water chemistry? (Y/N): (Note	e lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (*C) Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity (µmhos/cm)
is the sampling reach representative of the stream (Y/N) If	not, please explain:
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HHEI Score (sum of metrics 1, 2, 3):

CLOSSIT

SITE NAME/LOCATIONAMP -OH SITE NUMBER DS - [ - [ ] RIVER BASIN DRAINAGE AREA (mi²)	
LENGTH OF STREAM REACH (#) LAT LONG RIVER CODE RIVER MILE	
DATE 12/1/05 SCORER JAV COMMENTS stream has recovered since and	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruction	
	ov
STREAM CHANNEL DINONE / NATURAL CHANNEL DIRECOVERED DIRECOVERING DIRECENT OR NO RECOVER	RY
MOST IONICIUS.	
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	
	HHEI Netric
Image: Single state	oints
BOULDER (>256 mm) [16 pts]         Image: Constraint of the second s	ubstrate
Image: Description of the product of the pr	ax = 40
G GRAVEL (2-64 mm) [9 pts]	7
SAND (<2 mm) [6 pts]	
Total of Percentages of (A) Bidr Slabs, Boulder, Cobble, Bedrock (B) (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of Pool	ol Depth
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):	lax = 30
> 30 centimeters [20 pts]       > 5 cm - 10 cm [15 pts]         > 22.5 - 30 cm [30 pts]       □ / < 5 cm [6 pts]	
0         > 10 - 22.5 cm [25 pts]         Ø         NO WATER OR MOIST CHANNEL [0 pts]	$\mathcal{O}$
COMMENTSMAXINUM POOL DEPTH (centimeters):	
□ > 4.0 meters (> 13') [30 pts] □ 1.0 m - 1.5 m (> 3' 3" - 4' 6") [15 pts]	lankfull Width Nax=30
	5
COMMENTS AVERAGE BANKFULL WIDTH (meters)	
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY	
L R (Per Bank) L R (Most Predominant per Bank) L R	
Image     Image       Image     Image	
Field Woderate 5-10m W W Field	
Image: Second state of the se	
Image: None     Image: Descent Pasture     Image: Descent Pasture       COMMENTS     Image: Descent Pasture     Image: Descent Pasture	
FLOW REGIME (At Time of Evaluation)       (Check ONLY one box)         Stream Flowing       Image: Subsurface flow with isolated pools (Interstitial)         Subsurface flow with isolated pools (Interstitial)       Image: Subsurface flow with isolated pools (Interstitial)         COMMENTS	
SINUOSITY (Number of bends per 61 m (200 ft) of channel)         (Check ONLY one box):           None         1.0         2.0         3.0           0.5         1.5         2.5         >3	
STREAM GRADIENT ESTIMATE	

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA CLEARLY MARK THE SITE LOCATION         SGS Quadrangia Name: Aur Havren July UP OH NRCS Soit Map Page: NRCS Soit Map Stream Order munity: Marga County Township / City. Faturt Falls, Ohio and annot the stream of the stream order township / City. Faturt Falls, Ohio and a stream order munity: Marga County Township / City. Faturt Falls, Ohio and a stream order township / City. Faturt Falls, Ohio and a stream order or other township / City. Faturt Falls, Ohio and a stream order or other township / City. Internet of the stream order or other township / City. Internet of the stream order or other township / City. Internet of the stream or other township / City. Internet of the stream or other township / City. Internet of the stream order of the stream order of the stream (VIN). If not, please explain:         BIOTIC EVALUATION         Stream of the stream (VIN) Y If not, please explain:         Stream of the stream (VIN) Y If not, please explain:         Stream of the stream (VIN) Y If not, please explain:         Stream of the stream (VIN) Y If not, please explain:         Stream of the stream (VIN) Y If not, please explain:         Stream of the stream (VIN) Y If not, please explain:         Stream of the stream (VIN) Y If not, please explain:         Stream order of pollution impacts:         Onder order of pollution impacts:         Onder order order order order order order order order order (VIN)         Oper colspan ord		ds-1-11
DOWNESTREAM DESIGNATED USE(S) With Name:	DDITIONAL STREAM INFORMATION (This informatio	on Must Also be Completed):
WWW Name:       Distance from Evaluated Stream         ICWH Name:       Distance from Evaluated Stream         Distance from Evaluated Stream       Distance from Evaluated Stream         BAPPING: ATTACH COPES OF MAPS, INCLIDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         SGS Guadrangie Name:       NECS Soil Map Page:         MEDIA       Concol IV         Township / City:       MEDIA         MESSELLANEOUS       Township / City:         See Flow Conditions? (YRN):       Date of last precipitation:         JI/21/AS       Quantity:         MESSELLANEOUS       See Flow Conditions? (YRN):         See Flow Conditions? (YRN):       Date of last precipitation:         JI/21/AS       Quantity:         Wated Turbidity? (YNN):       Canopy (% open):         Canopy (% open):       20.72         ere samples collected for water chamistry? (YNI):       Metot precipitation:         Jid Measures:       Temp? (C)       Desclored Oxygen (mp?)         Jid Measures:       Temp? (YNI):       Metot precipitation:         Jid Measures:       Temp? (YNI):       Metot precipitation:         Jid Measures:       Temp? (YNI):       Metot precipitation:         Jid Measures:       Temp? (YNI):       Metot precipitatit accentration and attreact precipitatit we		Score (If Yes, Attach Completed QHE) Form)
CVM-Name:       Distance from Evaluated Stream         EWH Name:       Distance from Evaluated Stream         BAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         BGS Cluadengie Name:       Muxr:         Mapping:       Microstand Stream         Microstander       Muxr:         Microstander       Microstander         Microstander       Microstander         Missoellaneous       Missoellaneous         Missoellaneous	DOWNSTREAM DESIGNATED USE(S)	
EWH Name:		
IMAPPING: ATTACH COPIES OF MAPS, INCLUDING THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION SGS Quadrangle Name <u>Auro Haveton</u> , <u>UV-OH</u> NECS Sod Map Page NRCS Sod Map Steam Order UNICS <u>Provention</u> <u>NRCS Sod Map Steam Order</u> Township / Cay. <u>Astant Falls</u> , <u>Ohio area</u> <u>INISCELLANEOUS</u> see Flow Conditions? (VM): <u>Date of last precipitation</u>		
SGS Quadrangie Name ?Luc Havren, UV- OH NRCS Sod Map Page:NRCS Sod Map Stream Order unity:MargaContract yTownship / City:RatartFalls, Ohio area MISCELLAMEOUS see Flow Condition? (V/N): Date of last precipitation:/??/_AS Quantity: _unit intermet unity:MCA	EWH Name:	Distance from Evaluated Stream
unity:		
NISCELLANEOUS         see Flow Conditions? (YM):	SGS Quadrangie Name: 1000 14aveng W	<u>IV-OH</u> NRCS Soil Map Page: NRCS Soil Map Stream Order
see Flow Conditions? (Y/N):       Date of last precipitation:       11/21/25       Cuantity:       Latranian         uptograph information:	• V	Township / City: Latant Falls, Ohio area
polograph Information:		
evaled Turbidity? (YN): N Canopy (% open): ~30.72 are samples collected for water chemistry? (YN): N (Note lab sample no. or id. and attach results) Lab Number. and Measures: Temp (*C) Discolved Oxygen (mg/l) pH (S.U.) Conductivity (umbos/cm) the sampling reach representative of the stream (Y/N) Y If not, please explain: stillional comments/description of pollution impacts. BIOTIC EVALUATION aformed? (YN): A (If Yes, Record all observations. Youcher collections optional NOTE: all voucher samples must be labeled with the IO number. Include appropriate field data steets from the Primary Headwater Habital Assessment Manual) sh Observed? (YN): A voucher? (YN) A coller? (YN) A coller observed? (YN) voucher? (YN) ogs of Tacholos Observed? (YN) Voucher? (YN) A coller? (YN)		ipitation: 11/29/25 Quantity: Unternaver
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the sampling reach representative of the stream (Y/N) If not, please explain:	ield Measures: Temp (°C) Dissolved Oxyge	n (mo/l) aH (SU) Conductivity (umbos/cm)
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if patter pears new health	crannel of bycamol	Ageor.
	if patter Bearca	news field

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October 24, 2002 Revision

HHEI Score (sum of metrics 1, 2, 3): 40

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class II

SITE NAME/LOCATION <u>AMP-OH</u>	-2-2 RIVER BASIN	
LENGTH OF STREAM REACH (ft) L		
DATE 12/1/25 SCOPED TAV	COMMENTS TE AND Champing	ROUGE Touch and a de acoler
DATE 12/1/05 SCORER TAV	Potor to HE laid England Country of	Lind of stream reach
NOTE: Complete All items On This Form	- Refer to "Field Evaluation Manual for C	JNIO'5 PHWH SUBAINS" IOF INSTRUCTIONS
STREAM CHANNEL INONE / NATU MODIFICATIONS:	IRAL CHANNEL ØRECOVERED ØRECO	
	v type of substrate present. Check ONLY two p	
	is substrate types found (Max of B). Final metric s	score is sum of boxes A & B. HHE
	<u>RCENT</u> TYPE → SILT (3 of)	PERCENT Metric 2023 Points
BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts]	□□ SILT [3 pt] □□ LEAF PACKWOODY (	<u> </u>
BEDROCK [18 pt]		
		0 pt]
GRAVEL (2-64 mm) [9 pts]	<u>57</u> □ □ MUCK [0 pts] <u>-07</u> □ □ ARTIFICIAL [3 pts]	
Total of Percantages of Bidr Slabs, Boulder, Cobbie, Bedrock	2% "15	<sup>(B)</sup> 5 A+B
SCORE OF TWO MOST PREDOMINATE SUBST	TOTAL NUMBER	OF SUBSTRATE TYPES:
	ximum pool depth within the 61 meter (200 ft)	
evaluation. Avoid plunge pools from road ( > 30 centimeters [20 pts]	culverts or storm water pipes) (Check ONLY o	
22.5 - 30 cm [30 pts]	5 cm (5 pts)	
☐ > 10 - 22.5 cm [25 pts]		ST CHANNEL [0 pts]
COMMENTS motel chan	nel, no plave or pool MAXIMUM PO	OL DEPTH (centimeters):
3. BANK FULL WIDTH (Measured as the a	verage of 3-4 measurements) (Check	ONLY one box): Bankfull
> 4.0 meters (> 13') [30 pts]		3" - 4' 8") [16 pts] Width
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	C 21.0 m (2 3 3 ) <b>19 p</b> r	(s)
COMMENTS bank ) . I was	th overages average BA	NKELILI MADTH (materix)
appinimatel		
<i>0</i>	This information must also be completed	i
RIPARIAN ZONE AND FLOODPL		Right (R) as looking downstreamଘ
RIPARIAN WIDTH L /R / (Per Bank)	FLOODPLAIN QUALITY L R (Most Predominant per Bank)	LR
Ø Ø vide > 10m	DD / Mature Forest, Wetland	Conservation Tillage
Moderate 5-10m	Field	Urban or Industrial
DD Narrow <5m	Residential, Park, New Field	Open Pasture, Row
None None	🗇 💭 Fenced Pasture	Crop     Grop     Mining or Construction
COMMENTS		
FLOW REGIME (At Time of Evalu		<b>`</b>
<ul> <li>Stream Flowing</li> <li>Subsurface flow with isolated pools</li> </ul>	<b>A L -</b>	e) isolated pools, no flow (Intermittent) no water (Ephemeral)
COMMENTS		
SINUOSITY (Number of bends pe	r 61 m (200 ft) of channel) (Check ONLY one b	txoc
	1.0 2.0	3.0
L) 0.5	1.5 🗍 2.5	U >3
☐ Flat (0.5 m 100 m)	D Moderate (2 1/100 /l) D Moderate to	

ADDITIONAL STREAM INFORMATION IT is information Must Also be Completed::         CHES PERFORMED?       Yes       We ONE Score       (If Yes, Alson't Completed QHEI Form)         DOWNSTREAM DESIGNATED USE(S)       Distance from Evaluated Stream
DOWNSTREAM DESIGNATED USE(S)       Distance from Evaluated Stream         DWWH Name:       Distance from Evaluated Stream         DWWH Name:       Distance from Evaluated Stream         EWH Name:       Distance from Evaluated Stream         BYMH Name:       Distance from Evaluated Stream         MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE STE LOCATION         USOS Quadrangle Name:       MARK THE STE LOCATION         Base Flow Conditions? (YAN):       Date of last precipitation:       II/Q4/D5       Quantity:       MARK         Photograph Information:
□ WWH Name:       □ Distance from Evaluated Stream         □ CWH Name:       □ Distance from Evaluated Stream         □ EWH Name:       □ Distance from Evaluated Stream         □ Base Flow Conditions? (YAN):       W/OH         □ Caunty:
OWH Name:       Distance from Evaluated Stream         DEVM Name:       Distance from Evaluated Stream         DEVM Name:       Distance from Evaluated Stream         MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         UGGS Quadrangle Name:       Marx Marxin, WV-OH NRCS Soil Map Page:         NRCS Soil Map Stream Order
Distance from Evaluated Stream         MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE STE LOCATION         USGS Quadrangle Name: <u>Mut Harven</u> , <u>WV-OH</u> NRCS Soil Map Page:NRCS Soil Map Stream Order         County: <u>MUGA County</u> Township / City. <u>Attant Falls</u> , <u>Oflice and A</u> NISCELLANEOUS         Base Flow Conditions? (YM): <u>V</u> Date of last precipitation: <u>II/Q4/D5</u> Quantity: <u>MMX.count</u> Photograph Infomation:
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION         USGS Quadrangle Name: Must Planen, www-old NRCS Soil Map Page:
USGS Quadrangle Name: <u>Mut Harven</u> , <u>WV-OH</u> NRCS Soil Map Page:NRCS Soil Map Stream Order County: <u>Merga</u>
County:
MISCELLANEOUS         Base Flow Conditions? (Y/N): Y Date of last precipitation:
MISCELLANEOUS         Base Flow Conditions? (Y/N): Y Date of last precipitation:
Photograph Information:
Were samples collected for water chemistry? (Y/N):
Were samples collected for water chemistry? (Y/N):
Field Measures:       Temp (*C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)         ts the sampling reach representative of the stream (Y/N) If not, please explain:
ts the sampling reach representative of the stream (Y/N)
ts the sampling reach representative of the stream (Y/N)
Additional comments/description of pollution impacts:         BIOTIC EVALUATION         Performed? (Y/N):
BIOTIC EVALUATION         Performed? (Y/N):
Performed? (Y/N):
ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)         Fish Observed? (Y/N)       Voucher? (Y/N)         Frogs or Tadpoles Observed? (Y/N)       Voucher? (Y/N)         Voucher? (Y/N)       Aquatic Macroinvertebrates Observed? (Y/N)
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):
Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location
mag -0 nose
scrub shrub area with few trees with generated
FLOW
send-strutterer WWW Way
send stopsdaren AVA HA merhanging mutitiers aver metitiens

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October 24, 2002 Revision

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Class II

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Primary Headwater Habitat Evaluation Form

	HHEI Score (sum	of metrics 1, 2, 3) : 59
SITE NAME/LOCATIONATN) -0		
SITE NUMBER	S-2-5 RIVER BASIN	DRAINAGE AREA (ml²)
	LAT. LONG. RIVER CO	DE RIVER MILE
DATE 121115 SCORER 18	COMMENTS	
NOTE: Complete All Items On This Form	- Refer to "Field Evaluation Manual for Ohio's	PHWH Streams" for Instructions
STREAM CHANNEL		
MODIFICATIONS:	~	
(Max of 32). Add total number of significa TYPE BLDR SLABS [16 pts] BOULDER (>256 mm) [16 pts]	y type of substrate present. Check ONLY two predom Int substrate types found (Max of 8). Final metric score is INCENT TYPE INCENT TYPE INCENT IS IS INCENTION IS INCENTION IN INCENTION IN INCENTION IS INCENTION IS IN INCENTION IS INTENTIAL INCENTION IS INTENTIAL INCENTION IS INTENTIALIZABLE IN INCENTIALIZABLE IN INCENTIALIZABLE INTENTIALIZABLE INTENTIALIZABLE INTENTIALIZABLE INTENTIALIZZABLE INTENTI	s sum of boxes A & B. <u>PERCENT</u> <u>HHE</u> Metric Points
DU         BEDROCK [16 pt]           ZO         COBBLE (65-256 mm) [12 pts]         2	C CLAY or HARDPAN 10 pt	Max = 40
GRAVEL (2-64 mm) [9 pts]	5 00 MUCK [0 pts]	IO
SAND (<2 mm) [6 pts]	5 00 ARTIFICIAL (3 pts)	
Total of Percentages of		(B) A+B
Bidr Slabs, Boulder, Cobble, Bedrock	TATE TYPES: TOTAL NUMBER OF S	UBSTRATE TYPES:
2. Maximum Pool Depth (Measure the m	iximum pool depth within the 51 meter (200 ft) evalua	tion reach at the time of Pool Depth
evaluation. Avoid plunge pools from road	culverts or storm water pipes) (Check ONLY one boy	
↓ > 30 centimeters [20 pts] ↓ > 22.5 - 30 cm [30 pts]	> 5 cm - 10 cm (15 pts) < 5 cm (5 pts)	15
> 10 - 22.5 cm [25 pts]	NO WATER OR MOIST CH	IANNEL [0 pts]
COMMENTS 1 Solated DEC	MAXIMUM POOL DE	EPTH (centimeters):
3. BANK FULL WIDTH (Measured as the > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 5' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	average of 3-4 measurements) (Check OAL) > 1.0 m - 1.5 m (> 3' 3' - 4' B < 1.0 m (\$ 3' 3'') (5 pts)	
COMMENTS	AVERAGE BANKFU	LL WIDTH (meters)
	This information must also be completed	
RIPARIAN ZONE AND FLOOD	LAIN QUALITY TYNOTE: River Left (L) and Right (	R) as looking downstream☆
<u>RIPARIAN WIDTH</u> L L R (Per Bank)	ELOODPLAIN QUALITY L R (Most Predominant per Bank) L	R
Wide >10m	Mature Forest, Wetland	Conservation Tillage
Moderate 5-10m	Field	Urban or Industrial
Narrow <5m	🗋 🗍 🛛 Residential, Park, New Field 🗌	Open Pasture, Row Crop
COMMENTS Regrammy	Sylamon Michary Dity	Mining or Construction
FLOW REGIME (At Time of Eva Stream Flowing Subsurface flow with isolated por COMMENTS		ated pools, no flow (Intermittent) Ner (Ephemøral)
SINUOSITY (Number of bends r None	er 61 m (200 fl) of channel) (Check OWLY one box) 1.0 2.0 1.5 2.5	□ 3.0 □ ->3
STREAM GRADIENT ESTIMATE	Moderate (2 M100 II) O Moderate to Seve	re 🗍 Severe (10/0/100 k)

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ADDITIONAL STREAM INFORMATION (This Information Must Also be Complete	<b>d):</b>
QHEI PERFORMED? - DYes No QHEI Score (If Yes.	Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
CWH Name:	
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE <u>ENTIRE</u> WATERS	
USGS Quadrangle Name: <u>New Harren, WV-OH</u> NRCS Soil N	
County: Township / City:	Letart Falls, Ohio area
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation:	5 Quantity: unknown
Photograph Information:	
Elevaled Turbidity? (Y/N); Canopy (% open):	
Were samples collected for water chemistry? (Y/N): (Note tab sample no. o	rid, and attach results) Lab Number:
Field Measures: Temp (*C) Dissolved Oxygen (mg/l) pH (S.I	
Is the sampling reach representative of the stream (Y/N) If not, please explain	n:
Farind Reld approximately 40m from	but side s
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION Performed? (Y/N):	he Primary Headwater Habitat Assessment Manual) N) Voucher? (Y/N) tebrates Observed? (Y/N) Voucher? (Y/N)
DRAWING AND NARRATIVE DESCRIPTION OF STRE	AM REACH (This must be completed):
Include important landmarks and other features of interest for site evaluat	
a) type tages	Jours +
du ryperts manager and	
FLOW + Wujdreel + Kingus	nopence variation and
150/p/ Que Co	
dural press	Land Silver
The project open s	- June june
John John K V M	Friskey Lugny today Way ( K
PHWH Form Page -	2 2

October 24, 2002 Revision

Class TT

HHEI Score (sum of metrics 1, 2, 3) : Do SITE NAME LOCATION AMP-01 SITE NUMBER  $D \le -2 - 10$  RIVER BASIN DRAINAGE AREA (mi²) LENGTH OF STREAM REACH (fl) LONG. \_\_\_\_\_ RIVER CODE RIVER MILE DATE 12/1/05 SCORER COMMENTS NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions STREAM CHANNEL MONE / NATURAL CHANNEL COVERED RECOVERING RECENT OF NO RECOVERY **MODIFICATIONS:** SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes HHEI (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. Metric TYPE PERCENT PERCENT Points 00 BLDR SLABS [16 pts] SILT [3 pt] 00 00 5% LEAF PACK/WOODY DEBRIS [3 pts] BOULDER (>256 mm) [16 pts] Substrate 00 00 FINE DETRITUS [3 pts] BEDROCK [16 pt] Max = 4000 30 COBBLE (65-256 mm) [12 pts] CLAY or HARDPAN [0 pt] വഖ 00 GRAVEL (2-64 mm) [9 pts] MUCK [0 pts] 00 00 SAND (<2 mm) [6 pts] ARTIFICIAL [3 pts] Total of Percentages of (8) (A) A+B Bldr Slabs, Boulder, Cobble, Bedrock ~40% ь TOTAL NUMBER OF SUBSTRATE TYPES: SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: Pool Depth Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of 2 evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): Max = 30 Q п. > 5 cm - 10 cm [15 pts] > 30 centimeters [20 pts] М σ > 22.5 - 30 cm [30 pts] < 5 cm [5 pts] Ň NO WATER OR MOIST CHANNEL [0 pts] Ο > 10 - 22.5 cm [25 pts] 匕 MAXIMUM POOL DEPTH (centimeters): COMMENTS BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Bankfull > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4" 8") [15 pts] Width П > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (≤ 3' 3") [5 pts] Max=30 নি > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] 5.6 AVERAGE BANKFULL WIDTH (meters) COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY なNOTE: River Left (L) and Right (R) as looking downstreamな FLOODPLAIN QUALITY **RIPARIAN WIDTH** (Per Bank) LR (Most Predominant per Bank) I R 00 ៙៙ Wide >10m 00 Mature Forest, Welland **Conservation Tillage** Immature Forest, Shrub or Old ฬิ 00 00 Moderale 5-10m Urban or Industrial Field Open Pasture, Row 00 00 00 Residential, Park, New Fleid Narrow <5m Croo пп. 00 Fenced Pasture Mining or Construction None COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box); ð Moist Channel, isolated pools, no flow (Intermittent) Stream Flowing ň Subsurface flow with isolated pools (interstitial) Dry channel, no water (Ephemeral) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): 1.0 None 2.0 3.0 n 2.5 0.5 15 >3 STREAM GRADIENT ESTIMATE Moderate (2 (v100 ft) Fial (0.6 to 100 th) Fiat to Moderate D Moderate to Severe 

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QHEIPERFORMED? - TYES WNO QHE	Score (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
	Distance from Evaluated Stream
	Distance from Evaluated Stream
] EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLU	IDING THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: Mur Haven, h	ノンーのH NRCS Soil Map Page: NRCS Soil Map Stream Order
county: Merge County	Township/City: Letart Falls, Ohio area
MISCELLANEOUS	
	ipitation: 11/29/05 Quantity: untrum
Photograph Information:	
	on): ~ 50% (considers Trees and overhanging ninee)
Alere samples collected for water chemistry? (Y/N): <u>1</u>	(Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (*C) Dissolved Oxyge	en (mg/l) pH (S.U.) Conductivity (µmhos/cm)
s the sampling reach representative of the stream (Y/N)	Y If not, please explain:
Additional comments/description of pollution impacks:	
BIOTIC EVALUATION         Performed? (Y/N):	ations. Voucher collections optional. NOTE: all voucher samples must be labeled with the s ipriate field data sheats from the Primary Headwater Habitat Assessment Manual) ialamanders Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION         Performed? (Y/N):	alions. Voucher collections optional. NOTE: all voucher samples must be isbeled with the supriate field data sheats from the Primary Headwater Habitat Assessment Manual)
BIOTIC EVALUATION         Performed? (Y/N):	ations. Voucher collections optional. NOTE: all voucher samples must be labeled with the s ipriate field data sheats from the Primary Headwater Habitat Assessment Manual) ialamanders Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION Performed? (Y/N):	ations. Voucher collections optional. NOTE: all voucher samples must be labeled with the s ipriate field data sheats from the Primary Headwater Habitat Assessment Manual) ialamanders Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION Performed? (Y/N):	alions. Voucher collections optional. NOTE: all voucher samples must be isbeled with the s priate field data sheets from the Primary Headwater Habitat Assessment Manual) islamanders Observed? (Y/N) Voucher? (Y/N) N} Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUATION Performed? (Y/N):	alions. Voucher collections optional. NOTE: all voucher samples must be isbeled with the s priate field data sheets from the Primary Headwater Habitat Assessment Manual) ialamanders Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) SCRIPTION OF STREAM REACH (This must be completed):
BIOTIC EVALUATION Performed? (Y/N):	alions. Voucher collections optional. NOTE: all voucher samples must be isbeled with the s priate field data sheets from the Primary Headwater Habitat Assessment Manual) islamanders Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) SCRIPTION OF STREAM REACH (This must be completed): is of interest for site evaluation and a narrative description of the stream's location
BIOTIC EVALUATION Performed? (Y/N):	alions. Voucher collections optional. NOTE: all voucher samples must be isbeled with the supriate field data sheets from the Primary Headwater Habitat Assessment Manual) islamanders Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) SCRIPTION OF STREAM REACH (This must be completed): a of interest for site evaluation and a narrative description of the stream's location with function Magnetic Macroinvertebrates of a narrative description of the stream's location Magnetic Macroinvertebrates of a narrative description of the stream's location Magnetic Macroinvertebrates of a narrative description of the stream's location Magnetic Macroinvertebrates of a narrative description of the stream's location Magnetic Macroinvertebrates of a narrative description of the stream's location Magnetic Macroinvertebrates of a narrative description of the stream's location Macroinvertebrates of a
BIOTIC EVALUATION Performed? (Y/N):	alions. Voucher collections optional. NOTE: all voucher samples must be isbeled with the supriate field data sheets from the Primary Headwater Habitat Assessment Manual) islamanders Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) SCRIPTION OF STREAM REACH (This must be completed): a of interest for site evaluation and a narrative description of the stream's location with function Magnetic Macroinvertebrates of a narrative description of the stream's location Magnetic Macroinvertebrates of a narrative description of the stream's location Magnetic Macroinvertebrates of a narrative description of the stream's location Magnetic Macroinvertebrates of a narrative description of the stream's location Magnetic Macroinvertebrates of a narrative description of the stream's location Magnetic Macroinvertebrates of a narrative description of the stream's location Macroinvertebrates of a

Octoper 24, 2002 Revision

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PHWH Form Page - 2

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modified close I

HHEI Score (sum of metrics 1, 2, 3) : AMP-OH SITE NAME/LOCATION SITE NUMBER DS-30, b, c RIVER BASIN DRAINAGE AREA (mi<sup>2</sup>) LENGTH OF STREAM REACH (R) \_\_\_\_\_ LAT. \_\_\_\_\_ LONG. RIVER CODE RIVER MILE SCORER MID DATE 121105 COMMENTS Q JUNN Эb" neens only NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for instructions ONONE / NATURAL CHANNEL OR RECOVERED OR RECOVERING DECENT OR NO RECOVERY STREAM CHANNEL MODIFICATIONS: SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes 1. HHEI (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. Metric PERCENT NPE AD PERCENT Points 88 BLDR SLABS [16 pts] SILT [3 pt] 0X BOULDER (>256 mm) [16 pts] LEAF PACKWOODY DEBRIS [3 pts] Substrate пп ΠП BEDROCK [16 pt] FINE DETRITUS [3 pts] filax = 40 00 00 COBBLE (65-256 mm) [12 pts] CLAY or HARDPAN [0 pt] 00 00 GRAVEL (2-64 mm) [9 pts] MUCK [0 pts] d ന 00 ARTIFICIAL [3 pts] SAND (<2 mm) [6 pts] Total of Percentages of (8) A+B Bldr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of Pool Depth 2. evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): Max = 30 > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts] > 22.5 - 30 cm [30 pts] < 5 cm [5 pts] > 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts] JP COMMENTS MAXIMUM POOL DEPTH (centimeters): BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Bankfull 3 > 4.0 meters (> 13") [30 pts] ) > 1.0 m - 1.5 m (> 3' 3" + 4' 8") [15 pts] Width ð > 3.0 m - 4.0 m (> 9' 7" - 13') [26 pts] X ≤ 1.0 m (≤ 3\*3\*) [5 pts] Max=30 > 1.5 m ~ 3.0 m (> 9' 7" - 4' 8") [20 pts] AVERAGE BANKFULL WIDTH (meters) COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY TONOTE: River Left (L) and Right (R) as looking downstreams **RIPARIAN WIDTH** FLOODPLAIN QUALITY (Per Bank) (Most Predominant per Bank) R пп TAL. Wide >10m Mature Forest, Wetland **Conservation Tillage** Immature Forest, Shrub or Old 00 пп Moderate 5-10m Urban or Industrial Field Open Pasture, Row 00 00 00 Narrow <5m Residential, Park, New Field Crop 00 00 00 Mining or Construction None Fenced Pasture 1 man <u>nead</u> COMMENTS Na. FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Moist Channel, isolated pools, no flow (Intermittent) ñ X Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): 8 B P None 1.0 2.0 3.0 0.5 25 1.5 >3 STREAM GRADIENT ESTIMATE Moderate (2 #100 II) Flat (0.5 m 100 m) Flat to Moderate D Moderate to Severe Severe (10 10100 ft)

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	(If Yes, Attach Completed QHEt Form)
DOWNSTREAM DESIGNATED USE(S)	
) WWH Name:	Distance from Evaluated Stream
	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
SGS Quadrangle Name: <u>/ LEWF Navren, WV-C</u>	2 Hircs Soil Map Page: NRCS Soil Map Stream Order
ounty: <u>Meins</u> Ton	mship/city: hetart Falls, Ohio area
MISCELLANEOUS	11/29/05 quantity: unknown
notograph Information:	
evated Turbidity? (Y/N): N Canopy (% open):	
lere samples collected for water chemistry? (Y/N): (Note	lab sample no. or id. and attach results) Lab Number:
	pH (S.U.) Conductivity (µmhos/cm)
λ.	
the sampling reach representative of the stream $(Y/N)$	ot, please explain:
dditional comments/description of pollution impacts: Very 3	top silllary channel draining from
	cher collections optional. NOTE: all voucher samples must be labeled with the sit
sh Observed? (Y/N) Voucher? (Y/N) Salamander	data sheets from the Primary Headwater Habitat Assessment Manual) s Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) tualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
ish Observed? (Y/N) Voucher? (Y/N) Salamander rogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aq	s Observed? (Y/N) Voucher? (Y/N)
sh Observed? (Y/N) Voucher? (Y/N) Salamander rogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aq	s Observed? (Y/N) Voucher? (Y/N)
ish Observed? (Y/N) Voucher? (Y/N) Salamander rogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aq	s Observed? (Y/N) Voucher? (Y/N)
ish Observed? (Y/N) Voucher? (Y/N) Salamander rogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aq	s Observed? (Y/N) Voucher? (Y/N)
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sh Observed? (Y/N) Voucher? (Y/N) Salamander rogs of Tadpoles Observed? (Y/N) Voucher? (Y/N) Aq omments Regarding Biology: DRAWING AND NARRATIVE DESCRIPTION	s Observed? (Y/N) Voucher? (Y/N) pualic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) ON OF STREAM REACH (This must be completed): t for site evaluation and a narrative description of the stream's location
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modified class II

31

SITE NAME/LOCATION AMP - O H		e (sum of metrics	
site NUMBER_DS-4	RIVER BASIN	DRAINAG	E AREA (mi²)
LENGTH OF STREAM REACH (ft) LAT DATE 191105 SCORER _MOLCO	LONG (	RIVER CODE	
NOTE: Complete All Items On This Form - Refer 1	to "Field Evaluation Manual 1	or Ohio's PHWH Stre	ams" for instructions
STREAM CHANNEL		Écovering Drece	INT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of every type of t	•		1
(Max of 32). Add total number of significant substrat <u>TYPE</u> <u>PERCENT</u>	le types found (Max of 8). Final me <u>TYPE</u>		PERCENT Metr
BLDR SLABS [16 pts]		DDY DEBRIS [3 pts]	Poin
	G G FINE DETRITUS		Substr
COBBLE (65-256 mm) [12 pts] <u>15</u> (C) GRAVEL (2-64 mm) [9 pts] <u>30</u>	CLAY or HARDP/	N [9 p1]	
Image: Service (2-of min) (s pts)           Image: Service (2-of min) (s pts)           Image: Service (2-of min) (s pts)	ARTIFICIAL (3 pt	ہ [e	= 11/6
Total of Percentages of Bidr Slabs, Boulder, Cobble, Bedrock	A 12		(B) A+B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TY	PES: TOTAL NUM	BER OF SUBSTRATE T	YPES:
2. Maximum Pool Depth (Measure the maximum po			the time of Pool De
evaluation. Avoid plunge pools from road culverts of > 30 centimeters [20 pts]	r storm water pipes) (Check ON	•	Max =
> 22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts]		MOIST CHANNEL 10 pt	
COMMENTS			
3. BANK FULL WIDTH (Measured as the average of > 4.0 meters (> 13') [30 pts]	f 3-4 measurements) (Ci	neck ONLY one box):	Bankf Widti
> 3.0 m - 4.0 m (> 9' 7" - 13") [25 pts]	G ≤ 1,0 m (≤ 3'3")	[5 pts]	Max
[] > 1.5 m - 3.0 m (> 9' 7" - 4' 6") [20 pts]			115
COMMENTS	AVERAGI	E BANKFULL WIDTH (m	eters) Insural Insural
RIPARIAN ZONE AND FLOODPLAIN QUA	Information <u>must</u> also be comp LUTY \$NOTE: River Left (L) ( PLAIN QUALITY	leted and Right (R) as looking o	lownstream ය
L R (Per Bank) L R	(Most Predominant per Bank) Mature Forest, Wetland	~ ~ ~	an otion Tillago
Moderate 5-10m	Immature Forest, Shrub or Old		ervation Tillage n or Industrial
O Narrow <5m O O	Field Residential, Park, New Field		Pasture, Row
O None COMMENTSShrub And Kat	Fenced Pasture	Crop	g or Construction
FLOW REGIME (At Time of Evaluation) (C Stream Flowing Subsurface flow with isolated pools (Interstiti COMMENTS	Moist Ch	annel, isolated pools, no nel, no water (Ephemera	
SiNUOSITY (Number of bends per 61 m (20 None 0 1.0 0.5 0 1.5	00 ft) of channel) (Check OALY o 2.0 2.5	one box): 3.0 2 >3	
	-		<b>.</b>
🗍 Fial (0.5 #100 H) 🛛 Fial to Moderate 🗍 Mod	derate (2 m/100 m) OModera	ate to Severe	O Severe (10 // 100 //)

DCITIONAL STREAM INFORMATION (This information Must Also be Comple	ated):
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	
CWH Name:	
	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATE	
OS Quadrangle Name: New Harren, WV-OH NRCS So	Map Page: NRCS Soil Map Stream Order
unity: Meiz Township / City:	relate Julie, Onio anta
MISCELLANEOUS	
ase Flow Conditions? (Y/N): Date of last precipitation:	Quantity: Untrown
holograph Information:CL	
evated Turbidity? (Y/N): Canopy (% open):	
ere samples collected for water chemistry? (Y/N): <u>N</u> (Note lab sample no	o or id. and attach results) Lab Number:
eld Measures: Temp (*C) Dissolved Oxygen (mg/l) pH (	(S.U.) Conductivity (umhos/cm)
the sampling reach representative of the stream (Y/N) Y If not, please expl	
	lan:
ditional comments/description of pollution impacts: 449.1 at new	-crip Molt
BIOTIC EVALUATION	
	s optional NOTE: all voucher samples must be labeled with the site
erformed? (Y/N): (If Yes, Record all observations. Voucher collections	s optional. NOTE: all voucher samples must be labeled with the site m the Primary Headwaler Habitat Assessment Manual)
enformed? (Y/N):	m the Primary Headwaler Habitat Assessment Manual) Y(N) Voucher? (Y/N)
arformed? (Y/N):	m the Primary Headwaler Habitat Assessment Manual) Y(N) Voucher? (Y/N)
enformed? (Y/N): (If Yes, Record all observations. Voucher collections ID number, Include appropriate field data sheets from sh Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? ( ogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroiny	m the Primary Headwaler Habitat Assessment Manual) Y(N) Voucher? (Y/N)
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erformed? (Y/N):	m the Primary Headwaler Habitat Assessment Manual) Y/N} Voucher? (Y/N) vertebrales Observed? (Y/N) Voucher? (Y/N) REAM REACH {This must be completed}:
erformed? (Y/N):	m the Primary Headwaler Habitat Assessment Manual) Y/N} Voucher? (Y/N) vertebrales Observed? (Y/N) Voucher? (Y/N) REAM REACH {This must be completed}:
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erformed? (Y/N):	m the Primary Headwaler Habitat Assessment Manual) Y/N} Voucher? (Y/N) vertebrales Observed? (Y/N) Voucher? (Y/N) REAM REACH {This must be completed}:
erformed? (Y/N):	m the Primary Headwaler Habitat Assessment Manual)  Y(N)
erformed? (Y/N):	m the Primary Headwaler Habitat Assessment Manual)  Y(N)
erformed? (Y/N):	m the Primary Headwaler Habitat Assessment Manual)  Y(N) Voucher? (Y/N) Voucher? (Y/N)  REAM REACH (This must be completed):  uation and a narrative description of the stream's location
erformed? (Y/N):	m the Primary Headwaler Habitat Assessment Manual) Y(N) Voucher? (Y/N) Voucher? (Y/N) vertebrates Observed? (Y/N) Voucher? (Y/N) REAM REACH {This must be completed}: uation and a narrative description of the stream's location
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erformed? (Y/N):	m the Primary Headwaler Habitat Assessment Manual)  Y(N) Voucher? (Y/N) Voucher? (Y/N)  Vertebrales Observed? (Y/N) Voucher? (Y/N)  REAM REACH (This must be completed):  uation and a narrative description of the stream's location  XK /  XK /  XK /  XK /

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Octoper 24, 2002 Revision

PHWH Form Page - 2

Class I

27

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION AMP-OH	7.1		
SITE NUMBER			
LENGTH OF STREAM REACH (ft) $\sim 200^{1}$ L			
DATE 11/29/05 SCORER JAV			
NOTE: Complete All Items On This Form	/		
STREAM CHANNEL	IRAL CHANNEL RECOVER		RECENT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of every	r type of substrate present. Ch	eck ONLY two predominant su	ostrate TYPE boxes i
(Max of 32). Add total number of significant	it substrate types found (Max of		boxes A & B. HHEI
BLDR SLABS [16 pts]	<u>RCENT</u> <u>TYPE</u>	3 pt]	PERCENT Metric 10% Points
BOULDER (>256 mm) [16 pts]		PACK/WOODY DEBRIS [3 pts	1 <u>30%</u> 10% Substrate
BEDROCK [16 pt]     BEDROCK [16 pt]     COBBLE (65-256 mm) (12 pts)		DETRITUS [3 pts] or HARDPAN [0 pt]	50% Max = 40
GRAVEL (2-64 mm) [9 pts]		[0 pts]	1
SAND (<2 mm) [6 pts]	🗖 🗖 ARTIF	ICIAL [3 pts]	7
Total of Percentages of	3% A 3		(B) A + B
Bidr Slabs, Bouider, Cobbie, Bedrock SGDRE OF TWO MOST PREDOMINATE SUBST		OTAL NUMBER OF SUBSTRA	ATE TYPES:
2. Maximum Pool Depth (Measure the ma			ch at the time of <b>Pool Depth</b>
evaluation. Avoid plunge pools from road > 30 centimeters [20 pts]	culverts or storm water pipes) □ < > 5 o	(Check ONLY one box): m - 10 cm [15 pts]	Max = 30
> 22.5 - 30 cm [30 pts]	🗹 < 5 c	m (5 pts)	
[] > 10 - 22.5 cm [25 pts]		VATER OR MOIST CHANNEL	0 pts /2 /
		MAXIMUM POOL DEPTH (ce	entimeters):
3. BANK FULL WIDTH (Measured as the a		-	· 1
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		m - 1.5 m (> 3' 3" - 4' 8") [15 pts ≀m (≤ 3' 3") [5 pts]	i) Width
[] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]			35115
COMMENTS		AVERAGE BANKFULL WIDT	TH (meters)
RIPARIAN ZONE AND FLOODPL	This information <u>must</u> als	o be completed /er Left (L) and Right (R) as loo	king downstream 🕏
<b><u>RIPARIAN WIDTH</u></b>	FLOODPLAIN QUALITY	er den fer eine right (inf do ieb	and connercentar
L/R (Per Bank) D U Wide >10m	Most Predominant		Conservation Tillage
Moderate 5-10m	Immature Forest, SI	nauh er Old 🛛 🗂 🗖	Urban or Industrial
	Field		Open Pasture, Row
	Residential, Park, N     Fenced Pasture		Crop
COMMENTS forest align	undication of	being mature on	Mining or Construction
-trike are rively 	le and metare 18	trets are as wel	4)
🛄 Stream Flowing	M	Moist Channel, Isolated pool	•
U Subsurface flow with isolated pools COMMENTS	(Interslitial)	Dry channel, no water (Eph	emeral)
SINUOSITY (Number of bends pe	r 61 m (200 ft) of channel) <u>(C</u> h	eck ONLY one box):	
None     None     O     0.5	1.0 I 1.5 I	2.0 U 2.5 U	3.D >3
STREAM GRADIENT ESTIMATE			-
Fial (0.5 N/100 n) Fiat to Moderate	Moderate (2 tr/100 tip	Moderate to Severe	Severe (10 /// 100 ft)
		······································	

	0F1
DDITIONAL STREAM INFO	RMATION (This information Must Also be Completed):
QHEI PERFORME	07 - 🗍 Yes 🖉 No GHEI Score (If Yes, Atlach Completed GHEI Form)
DOWNSTREAM D	ESIGNATED USE(S)
	Distance from Evaluated Stream
	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
	COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
SGS Quadrangle Name:	Lew Marren, WV-OH_ NRCS Soil Map Page: NRCS Soil Map Stream Order
ounty: <u>Morgo</u> ,	County Township/City: Letart Salls, Ohio area
ase Flow Conditions? (Y/N)	N Date of last precipitation: 11/29/05 Quantity: unknown
hotograph Information:	yes
	Canopy (% open): <u>~ 30%</u>
Vere samples collected for w	ater chemistry? (Y/N); N (Note lab sample no. or id. and attach results) Lab Number;
ield Measures: Temp (°C	Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
	ntative of the stream (Y/N) / If not, please explain:
s are sampang reach represe	madive of the stream (r/N) if not, please explain
	ion of pollution impacts:
BIOTIC EVALUAT Performed? (Y/N): <u>N</u> Fish Observed? (Y/N) <u>N</u> Frogs or Tadpoles Observed	ION         (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habilat Assessment Manual)         Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N)         Y(V) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
<u>BIOTIC EVALUAT</u> Performed? (Y/N): <u>N</u> Fish Observed? (Y/N) <u>N</u> Frogs or Tadpoles Observed Comments Regarding Biolog	ION         (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habilat Assessment Manual)         Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N)         Y(V) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
BIOTIC EVALUAT Performed? (Y/N):N Fish Observed? (Y/N) Frogs or Tadpoles Observed Comments Regarding Biolog	ION         (If Yes. Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habilat Assessment Manual)         Voucher? (YN)
BIOTIC EVALUAT Performed? (Y/N): Frogs or Tadpoles Observed Comments Regarding Biolog // DRAWING A Include important lan	ION         (If Yes. Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habilat Assessment Manual)         Voucher? (YN) Salamanders Observed? (Y/N) Voucher? (Y/N)         Voucher? (YN) Salamanders Observed? (Y/N) Voucher? (Y/N)         Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)         r
BIOTIC EVALUAT Performed? (Y/N):N Fish Observed? (Y/N) Frogs or Tadpoles Observed Comments Regarding Biolog	ION         (If Yes. Récord all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habilat Assessment Manual)         Voucher? (Y/N)Salamanders Observed? (Y/N)Voucher? (Y/N)Voucher? (Y/N)Voucher? (Y/N)Voucher? (Y/N)Voucher? (Y/N)         ?(Y/N)Voucher? (Y/N)Aquatic Macroinvertebrates Observed? (Y/N)Voucher? (Y/N)         ?(Y/N)Voucher? (Y/N)Aquatic Macroinvertebrates Observed? (Y/N)Voucher? (Y/N)         ?(Y)Voucher? (Y/N)Aquatic Macroinvertebrates Observed? (Y/N)Voucher? (Y/N)         ?(Y)Voucher? (Y/N)Aquatic Macroinvertebrates Observed? (Y/N)Voucher? (Y/N)         MD NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):         dmarks and other features of interest for site evaluation and a narrative description of the stream's location
BIOTIC EVALUAT Performed? (Y/N): Frogs or Tadpoles Observed Comments Regarding Biolog // DRAWING A Include important lan	ION         (If Yes. Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the sile ID number. Include appropriate field data sheets from the Primary Headwater Habilat Assessment Manual)         Voucher? (Y/N)

SITE NAME (	CATION AMP-0	19			<u> </u>	
Stream	SITE NUMBE	ER <u>S-2</u>	RIVER BASIN		DRAINAGE AREA (mi²)	Imi .
LENGTH OF ST	TREAM REACH (ft) 200	)LAT	LONG		RIVER MILE	
	-05 SCORER BA					
	Nonel					
STREAM CH	。	ANATURAL CHAN		N, EUR⊒Ge)y=RNC	EIREENTICIANORES A REENTICIANO RES	OVERY
	TRATE (Estimate percent of 32). Add total number of s		•			HH
	DR SLABS [16 pts]	ST 5			PERCENT	Me   Poi
ВО	DULDER (>256 mm) [16 pts DROCK [16 pt]			KAWOODY DEBRIS 13		Subs
	BBLE (65-256 mm) [12 pts	<u>Z30</u>		RITUS <b>[3 pis]</b> (ARDPAN <b>10 pi</b> ]	Z40	Max
<u></u>	(AVEL (2-64 mm) [9 pts] ND (<2 mm) [6 pts]	§ <del>7 70</del>		pts] \L [3 pts]		/{
	N CARACINE NEW YORK CHARACTER	3~0	(A)		(B) <b>[</b> 77]	
Bidr Si	Total of Percentages of abs, Boulder, Cobble, Bedro /O MOST PREDOMINATE \$	ock <u>05 7</u> 0	R	L NUMBER OF SUBS	φ	. ^*
						Pool I
	um Pool Daoth (Mesture )			SCOLEN TRANSMICS DAGINGTINI		
	tion. Avoid plunge pools from		torm water pipes) (Ch	eck ONLY one box):		
☑         > 30 ce           □         > 22.5	tion. Avoid plunge pools fror ntimeters [20 pts] - 30 cm [30 pts]	m road culverts or si	torm water pipes) (Ch	eck ONLY one box): 10 cm [15 pts] i pts]		
✓     > 30 ce       □     > 22.5       □     > 10 - 2	tion. Avoid plunge pools from ntimeters [20 pts] - 30 cm [30 pts] 22.5 cm [25 pts]	m road culverts or si	torm water pipes) (Ch 5 cm 5 cm 5 cm 1 < 5 cm 1 NO WAT	eck ONLY one box); 10 cm <b>[15 pts]</b> 1 pts] ER OR MOIST CHANN	VEL [0 pts]	
✓         > 30 cer           □         > 22.5           □         > 10 ÷           COMM	tion. Avoid plunge pools from ntimeters [20 pts] - 30 cm [30 pts] 22.5 cm [25 pts] IENTS	m road culverts or si	torm water pipes) (Ch 5 cm 5 cm 5 cm 8 cm 8 cm 8 cm 8 cm 8 cm 8 cm 8 cm 8	eck ONLY one box); 10 cm [15 pts] ER OR MOIST CHANN XMUM POOL DEPTH	NEL 10 pts)	70
3. BANK 2015 2255 2255 2105 2005 2	tion. Avoid plunge pools from nimeters [20 pts] - 30 cm [30 pts] 22.5 cm [25 pts] IENTS FULL WIDTH (Measured a elers (> 13) [30 pts]	m road culverts or si	torm water pipes) (Ch 5 cm 5 cm 5 cm 5 cm 1 5 cm 1 NO WAT M/ 4 measurements) 2 1.0 m	eck ONLY one box); 10 cm [15 pts] ER OR MOIST CHANN XIMUM POOL DEPTH (Check ONLY one 1.5 m (> 3' 3' -4' 8') [14	NEL 10 pts]	Pc Banl Wid
✓     > 30 cer       ✓     > 22:5       ✓     > 10       COMM       3.     BANK       ✓     > 4.0 me       ✓     > 3.0 m	tion. Avoid plunge pools from nimeters [20 pts] - 30 cm [30 pts] 22.5 cm [25 pts] IENTS	m road culverts or si	torm water pipes) (Ch 5 cm 5 cm 5 cm 5 cm 1 5 cm 1 NO WAT M/ 4 measurements) 2 1.0 m	eck ONLY one box); 10 cm [15 pts] ER OR MOIST CHANN XIMUM POOL DEPTH (Check ONLY one	NEL 10 pts]	Pc Banl Wid
✓     > 30 cer       ✓     > 22:5       ✓     > 10       COMM       3.     BANK       ✓     > 4.0 me       ✓     > 3.0 m	tion. Avoid plunge pools from nimeters [20 pts] - 30 cm [30 pts] 22.5 cm [25 pts] ENTS FULL WIDTH (Measured a elers (> 13) [30 pts] - 4.0 m (> 9' 7" - 13') [25 pts - 3.0 m (> 9' 7" - 4' 6") [20 pt	m road culverts or si	torm water pipes) (Ch 5 cm 5 cm NO WAT NO WAT M/ 4 measurements) 2 1.0 m	eck ONLY one box); 10 cm [15 pts] ER OR MOIST CHANN XIMUM POOL DEPTH (Check ONLY one 1.5 m (> 3' 3' -4' 8') [14	VEL 10 pts)	Max PC Banl Wid Max S
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✓       > 30 cm         ✓       > 22:5         ✓       > 10 · 2         ✓       > 10 · 2         ✓       > 10 · 2         ✓       > 4.0 mm         ✓       > 3.0 m         ✓       > 3.0 m         ✓       > 3.0 m         ✓       > 15 m         ✓       ✓	tion. Avoid plunge pools from ntimeters [20 pts] - 30 cm [30 pts] 22.5 cm [25 pts] ENTS FULL WIDTH (Measured a elefs (> 13) [30 pts] - 4.0 m (> 9 77 - 13) [25 pts - 3.0 m (> 9 77 - 4 67) [20 pt ENTS RIPARIAN ZONE AND FLO RIPARIAN ZONE AND FLO RIPARIAN WIDTH (Per Bank) Wide > 10m Moderate 5-10m	m road culverts or si s the average of 3 is the average of 3 is codpl.ain QUALIT FLOODPL L R D I I	torm water pipes) (Ch	eck <i>ONLY</i> one box): 10 cm [15 pts] ER OR MOIST CHANN (Check ONLY one 1.5 m (> 3' 3' -4' 8') [14 ≤ 3' 3') [5 pts] ERAGE BANKFULL V e completed eft (L) and Right (R) as Bank) L R or Old □ □	VEL 10 pts)	Pc Banl Wid
<ul> <li>30 cel</li> <li>22:5</li> <li>&gt;10</li> <li>22:5</li> <li>&gt;10</li> <li>22:5</li> <li>&gt;10</li> <li>22:5</li> <li>&gt;10</li> <li>22:5</li> <li>&gt;10</li> <li>22:5</li> <li>&gt;10</li> <li>22:5</li> <li>23:5</li> <li>24:5</li> <li>24</li></ul>	tion. Avoid plunge pools from nimeters [20 pts] - 30 cm [30 pts] 22.5 cm [25 pts] ENTS FULL WIDTH (Measured a elefs (> 13) [30 pts] - 4.0 m (> 9 77 - 13) [25 pts - 3.0 m (> 9 77 - 4 ° 67 [20 pt ENTS RIPARIAN ZONE AND FLO RIPARIAN WIDTH (Per Bank) Wide > 10m	This int COOPPLAIN QUALIT FLOODPL L R COOPPLAIN QUALIT FLOODPL I R I R I R I R I R I R I R I R	Image: Source water pipes)         (Ch           Image: Source water source water pipes)         Source water source so	eck <i>ONLY</i> one box): 10 cm [15 pts] ER OR MOIST CHANN (Check ONLY one 1.5 m (> 3' 3' -4' 8') [14 ≤ 3' 3') [5 pts] ERAGE BANKFULL V e completed eft (L) and Right (R) as Bank) L R or Old □ □	VIDTH (meters)	Pc Banl Wid
✓       > 30 cm         ✓       > 22:5         ✓       > 10 ·         COMM          3.       BANK         ✓       > 4.0 mm         ✓       > 3.0 mm         ✓       > 3.0 mm         ✓       > 1.5 mm         COMM         ✓       ✓         ✓	tion. Avoid plunge pools from nimeters [20 pts] - 30 cm [30 pts] 22.5 cm [25 pts] ENTS FULL WIDTH (Measured a eters (> 13') [30 pts] - 4.0 m (> 9' 77 - 13') [25 pts 3.0 m (> 9' 77 - 4' 8') [20 pt ENTS ENTS RIPARIAN ZONE AND FLO RIPARIAN VVIDTH (Per Bank) Wide >10m Moderate 5-10m Narrow <5m	This int COOPLAIN QUALT FLOODPLAIN QUALT FLOODPLAIN QUALT GOODPLAIN QUALT	torm water pipes) (Ch	eck <i>ONLY</i> one box): 10 cm [15 pts] ER OR MOIST CHANN (Check ONLY one 1.5 m (>3' 3' -4' 8') [14 ≤ 3' 3') [5 pts] ERAGE BANKFULL W e completed eft (L) and Right (R) as 3ank) L R or Old □ □ isid □ □	VEL 10 pts]	Pc Banl Wid
✓       > 30 ce         ✓       > 22:5         ✓       > 10         ✓       > 10         3.       ■         ✓       > 4.0 me         ✓       > 3.0 m         ✓       > 1.5 m         COMM         ✓       > 1.5 m         ✓       > 10         ✓       ✓	tion. Avoid plunge pools from nimeters [20 pts] - 30 cm [30 pts] 22.5 cm [25 pts] ENTS FULL WIDTH (Measured a blers (> 13) [30 pts] - 4.0 m (> 9 77 - 13) [25 pts - 3.0 m (> 9 77 - 4 87) [20 pt ENTS RIPARIAN ZONE AND FLO RIPARIAN ZONE AND FLO RIPARIAN WIDTH (Per Bank) Wide > 10m Moderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time o	This int COOPLAIN QUALT FLOODPLAIN QUALT FLOODPLAIN QUALT I R ( I R	torm water pipes) (Ch	eck <i>ONLY</i> one box): 10 cm [15 pts] ER OR MOIST CHANN (Check ONLY one 1.5 m (>3'3' -4'8') [14 < 3'3'] [5 pts] ERAGE BANKFULL V e completed eft (L) and Right (R) as 3ank) L R or Old ] ] ield ] ]	VEL 10 pts]	
✓       > 30 ce         ✓       > 22:5         ✓       > 10         ✓       > 10         3.       ■         ✓       4.0 me         ✓       3.0 ml         ✓       > 3.0 ml         ✓       > 15 ml         ✓       ✓         ✓	tion. Avoid plunge pools from nimeters [20 pts] - 30 cm [30 pts] 22.5 cm [25 pts] ENTS FULL WIDTH (Measured a elefs (> 13) [30 pts] - 4.0 m (> 9 77 - 13) [25 pts - 3.0 m (> 9 77 - 4 87) [20 pt ENTS - 4.0 m (> 9 77 - 4 87) [20 pt ENTS RIPARIAN ZONE AND FLO RIPARIAN VIDTH (Per Bank) Wide > 10m Moderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time o Stream Flowing Subsurface flow with isolated	m road culverts or si is the average of 3 is the average of 3 its] DODPLAIN QUALT FLOODPL L R ( C ) FLOODPL I R ( C ) FLOODPLI R ( C ) F	torm water pipes) (Ch	eck <i>ONLY</i> one box): 10 cm [15 pts] ER OR MOIST CHANN (Check ONLY one 1.5 m (>3'3' -4'8') [14 < 3'3'] [5 pts] ERAGE BANKFULL V e completed eft (L) and Right (R) as 3ank) L R or Old ] ] ield ] ]	VEL 10 pts 4 (centimeters): 4 (centimeters): 5 pts): 4 (centimeters): 5 pts): 4 (centimeters): 5 pts): 4 (centimeters): 5 pts): 5 pts: 5 pts): 5 pts: 5 pts	
✓       > 30 ce         ✓       > 22:5         ✓       > 10         ✓       > 10         3.       BANK         ✓       > 4.0 me         ✓       3.0 m         ✓       > 1.5 m         ✓       > 1.5 m         ✓       ✓         ✓	tion. Avoid plunge pools from nimeters [20 pts] - 30 cm [30 pts] 22.5 cm [25 pts] ENTS FULL WIDTH (Measured a elefs (> 13) [30 pts] - 4.0 m (> 9 77 - 13) [25 pts - 3.0 m (> 9 77 - 4 87) [20 pt ENTS RIPARIAN ZONE AND FLO RIPARIAN ZONE AND FLO RIPARIAN VIDTH (Per Bank) Wide > 10m Moderate 5-10m Narrow <5m None COMMENTS FLOW REGIME (At Time o Stream Flowing	m road culverts or si is the average of 3 is the average of 3 its] This int COOPLAIN QUALIT FLOODPL L R ( C C PL C C C C C C C C C C C C C C C C C C C	torm water pipes) (Ch	eck <i>ONLY</i> one box): 10 cm [15 pts] ER OR MOIST CHANN (Check <i>ONLY</i> one 1.5 m (> 3' 3' -4' 8') [14 ≤ 3' 3') [5 pts] ERAGE BANKFULL V e completed eft (L) and Right (R) as 3ank) L R or Old ] ] isid ] ] koist Channel, isolated p ry channel, no water (E	VEL 10 pts 4 (centimeters): 4 (centimeters): 5 pts): 4 (centimeters): 5 pts): 4 (centimeters): 5 pts): 4 (centimeters): 5 pts): 5 pts: 5 pts): 5 pts: 5 pts	

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DDITIONAL STREAM INFORMATION (This Information Must A	Also be Completed):
QHEI PERFORMED? - DYes X No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	
	Distance from Evaluated Stream Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
SGS Quadrangle Name: / Lew Movies 0 0 H	NRCS Soil Map Page: NRCS Soil Map Stream Order
ounty: <u>Mugi OSVA</u> To	wiship/ City: Letart Fallo, Ohio area
	· · · · · · · · · · · · · · · · · · ·
ase Flow Conditions? (Y/N):	11-29-05 Quantity: Bonhnorm
otograph information:	
evated Turbidity? (Y/N): Canopy (% open):	0 %
ere samples collected for water chemistry? (Y/N): <u>//</u> (Note	lab sample no. or id. and attach results) Lab Number
eld Measures: Temp (°C) Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity (µmhos/cm)
	not, please explain:
ditional comments/description of pollution impacts:	
	cher collections optional. NOTE: all voucher samples must be labeled with the site data sheets from the Primary Headwater Habitat Assessment Manual)
rogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aq	s Observed? (Y/N) Voucher? (Y/N) uatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
comments Regarding Biology:	
DRAWING AND NARRATIVE DESCRIPTION	ON OF STREAM REACH (This <u>must</u> be completed):
	t for site evaluation and a narrative description of the stream's location
Structure of the state of the s	COLOR CALL CALL
	Handhand Care a loo a
BL S. S. Share	ETAL

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Strem	ATION <u>AMP-01</u> SITE NUMBER	<u> 5-3</u>			RAINAGE AREA (mi²)	
				RIVER CODE _	RIVER MILE	
	05SCORER <u>736</u> lete All Items On This	· _/ ···	OMMENTS	terusi fra Obiela Dil		
						乙酸白酸乙酸酯
TREAM CHAI		NATURAL CH	ANNEL  LJ RECOVERE	D. EIRECOVERING	DRECENT OR NO REC	OVERY
	ATE (Estimate percent of 32). Add total number of sig					нн
TYPE		PERCENT	TYPE		PERCENT	Me Poi
DD BOU	? SLABS [16 pts] LDER (>256 mm) [16 pts]			79 CKWOODY DEBRIS (3	ptsj 210	
	ROCK [16 pt] BLE (65-256 mm) [12 pte]	Vind		TRITUS [3 pts] HARDPAN [0 pt]		Subs Max
	VEL (2-64 mm) (9 pts)	100		The second s		
	D (<2 mm) [6 pts]			IAL <b>[3 pts]</b>		
	ial of Percentages of s, Boulder, Cobble, Bedroc	* 25	(A) 2/		<sup>(B)</sup>	A+
	MOST PREDOMINATE S		PES: 47 TOT	AL NUMBER OF SUBS		
	n Pool Depth (Measure th				reach at the time of	Pool
	n. Avoid plunge pools from meters [20 pts]	road cuiverts o		heck ONLY one box): • 10 cm [15 pts]		Max
□>22.5 -3	0 cm [30 pts] 5 cm [25 pts]		🔄 🔲 🖂 5 cm			$\varphi_{e}$
		<u></u>				
COMME			·····	IAXIMUM POOL DEPTH	· · · · · · · · · · · · · · · · · · ·	[
	JLL WIDTH (Measured as (s (> 13) [30 pts]	the average of		(Check ONLY one 1.5 m (> 3' 3' - 4' 8') [15		Ban Wi
	4.0 m (> 9' 7" - 13') [25 pts] 3.0 m (> 9' 7" - 4' 8") [20 pts		<b>D ≤ t0</b> m	(≤ 3' 3") [5 pts]		Max
COMME		™ to governikengerkengerken	(* 200 ) A	VERAGE BANKFULL W	(DTH (maters)	1 2
	IPARIAN ZONE AND FLO		information <u>must</u> also I	e completed Left (L) and Right (R) as	Insking downstreem\$	
	<u>RIPARIAN WIDTH</u>		PLAIN QUALITY		looking downeries in a	
	(Per Bank) Wide >10m	L R DD	(Most Predominant per Mature Forest, Wetland		Conservation Tillage	
	-Moderate 5-10m		Immature Forest, Shru			
00	Narrow <5m		Field Residential, Park, New	Field · 🗍 🗍	Open Pasture, Row	C).
00	None		Fenced Pasture		Crop Mining or Construction	·c\
C	OMMENTS			······		
	LOW REGIME (At Time of ream Flowing	Evaluation) (C		Moiet Channel isolated r	ools, no flow (Intermittent	
_	bsurface flow with isolated	pools (Interstiti		Dry channel, no water (E		,
-	OMMENTS					-
	INUOSITY (Number of ben					

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QHEI PERFORMED? - 🗍 Yes 🕅	No QHEI Score (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE	
	Distance from Evaluated Stream
	Distance from Evaluated Stream
DEWH Name:	Distance from Evaluated Stream
	PS, INCLUDING THE <u>ENTIRE</u> WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
	MRCS Soil Map Page: NRCS Soil Map Stream Order
Sounty: Merca County	Township / City: Letart falls, Ohio are
MISCELLANEOUS	<i>v</i>
	flast precipitation: 11-29-05 Quantity: Unhmorm
	The approximation
Photograph Information:	200)
	1
Vere samples collected for water chemistry? (Y	r/N): _// (Note lab sample no. or id. and attach results) Lab Number:
	ved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
the sampling reach representative of the stream	am (Y/N) If not, please explain:
Commonal commems/description of pollution imp	pacts:
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record a ID number. Inclu ish Observed? (Y/N) Voucher? (Y/N) rogs or Tadpoles Observed? (Y/N) Vouc	all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the appropriate field data sheets from the Primary Headwater Habitat Assessment Manual) Salamanders Observed? (Y/N) Voucher? (Y/N) cher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Performed? (Y/N): (If Yes, Record a ID number. Inclu Fish Observed? (Y/N) Voucher? (Y/N) Vouc Frogs or Tadpoles Observed? (Y/N) Vouc	ude appropriate field data sheets from the Primary Headwater Habital Assessment Manual)
Performed? (Y/N): (If Yes, Record a ID number. Inclu Fish Observed? (Y/N) Voucher? (Y/N) Vouc Frogs or Tadpoles Observed? (Y/N) Vouc	ude appropriate field data sheets from the Primary Headwater Habital Assessment Manual)
Performed? (Y/N): (If Yes, Record a ID number. Inclu Fish Observed? (Y/N) Voucher? (Y/N) Frogs or Tadpoles Observed? (Y/N) Vouc Comments Regarding Biology:	ude appropriate field data sheets from the Primary Headwater Habital Assessment Manual)
Performed? (Y/N): (if Yes, Record a ID number. Inclu Fish Observed? (Y/N) Voucher? (Y/N) Vouc Frogs or Tadpoles Observed? (Y/N) Vouc Comments Regarding Biology: DRAWING AND NARRATIN	ude appropriate field data sheets from the Primary Headwater Habital Assessment Manual)Salamanders Observed? (Y/N)Voucher? (Y/N) cher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
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Performed? (Y/N): (If Yes, Record a ID number. Inclu ish Observed? (Y/N) Voucher? (Y/N) Vouc frogs or Tadpoles Observed? (Y/N) Vouc comments Regarding Biology: DRAWING AND NARRATIN Include important landmarks and other	ude appropriate field data sheets from the Primary Headwater Habital Assessment Manual)
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Performed? (Y/N): (If Yes, Record a ID number. Inclu Fish Observed? (Y/N) Voucher? (Y/N) Vouc Frogs or Tadpoles Observed? (Y/N) Vouc Comments Regarding Biology: DRAWING AND NARRATIN Include important landmarks and other	ude appropriate field data sheets from the Primary Headwater Habital Assessment Manual)
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erformed? (Y/N): (If Yes, Record a ID number. Inclu ish Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) Voucher? comments Regarding Biology: DRAWING AND NARRATIN Include important landmarks and other	ude appropriate field data sheets from the Primary Headwater Habital Assessment Manual)
erformed? (Y/N):	ude appropriate field data sheets from the Primary Headwater Habital Assessment Manual)
Informed? (Y/N):	ude appropriate field data sheets from the Primary Headwater Habital Assessment Manual)

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Class II

HHEI Score (sum of metrics 1, 2, 3) AMP-OH SITE NAME/LOCATION SITE NUMBER 5-4 RIVER BASIN DRAINAGE AREA (mi<sup>2</sup>)\_ LENGTH OF STREAM REACH (R) ~ 200' LAT. LONG. RIVER CODE RIVER MILE DATE 11/29/05 SCORER JAV COMMENTS NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions O NONE / NATURAL CHANNEL O RECOVERED RECOVERING RECENT OR NO RECOVERY **STREAM CHANNEL MODIFICATIONS:** SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes HHE (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. Metric PERCENT PERCENT <u> TYPE</u> Points BLDR SLABS [16 pts] 00 SILT [3 pt] 00 00 LEAF PACK/WOODY DEBRIS [3 pts] 80ULDER (>256 mm) [16 pts] Substrate 00 00 BEDROCK (16 pt) FINE DETRITUS [3 pts] Max = 40 00 00 CLAY or HARDPAN [0 pt] COBBLE (65-256 mm) [12 pts] 00 00 GRAVEL (2-64 mm) [9 pts] MUCK [0 pts] Ó 00 SAND (<2 mm) [6 pts] ARTIFICIAL [3 pts] Total of Percentages of (B) A+B 6 Bidr Slabs, Bouider, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES: Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of Pool Depth 2 evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): Max = 30 D Г > 5 cm - 10 cm [15 pts] > 30 centimeters [20 pts] Г > 22.5 - 30 cm [30 pts] < 5 cm [5 pts] NO WATER OR MOIST CHANNEL [0 pts] > 10 - 22.5 cm [25 pts] 1/5" MAXIMUM POOL DEPTH (centimeters): COMMENTS BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): Bankfull > 4.0 meters (> 13') [30 pts] Π > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] Width П > 3.0 m - 4.0 m (> 9' 7" - 13") [25 pts] ≤ 1.0 m (≤ 3' 3") [5 pts] Max#30 > 1.5 m - 3.0 m (> 9'7" - 4' 8") [20 pts] AVERAGE BANKFULL WIDTH (meters) COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream과 **RIPARIAN WIDTH** FLOODPLAIN QUALITY (Most Predominant per Bank) (Per Bank) L⁄R 00 Wide >10m Mature Forest, Welland Conservation Tillage Immature Forest, Shrub or Old 00 00 Urban or Industrial Moderate 5-10m Field **Open Pasture**, Row 00 00 00 Narrow <5m Residential, Park, New Field Crop 00 00 пп Fenced Pasture None Mining or Construction COMMENTS 10000 consists of a myred and immatule matting FLOW REGIME (At Time of Evaluation) (Check ONLY one box)/ Moist Channel, isolated pools, no flow (Intermittent) Stream Flowing Subsurface flow with isolated pools (Interstitial) Ο Dry channel, no water (Ephemeral) COMMENTS\_ (Check ONLY one box): SINUOSITY (Number of bends per 61 m (200 ft) of channel) None 1.0 3.0 Ē ā 0.5 1.5 2.5 STREAM GRADIENT ESTIMATE Flat (0.5 m/100 m) Severe (10 #/100 #) Flat to Moderate Moderate (2 fiving in) Moderate to Severe PHWH Form Page - 1 October 24, 2002 Revision

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	Distance from Evaluated Stream
	Distance from Evaluated Stream
	Distance from Evaluated Stream
· · · · · · · · · · · · · · · · · · ·	E ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
	OH       NRCS Soil Map Page:       NRCS Soil Map Stream Order
County: //ugsT	ownship/city: Letant Falls, Ohio area
MISCELLANEOUS	
MISCELLANEOUS Base Flow Conditions? (Y/N): Date of last precipitation: Photograph information:	11/29/05 Quantity: unknown
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% open):	<u>+0%</u>
Were samples collected for water chemistry? (Y/N): (Not	e lab sample no. or id. and attach results} Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity (µmhas/cm)
is the sampling reach representative of the stream (Y/N) $V$ if	not, please explain:
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Additional comments/description of politution impacts:	
	ucher collections optional. NOTE: all voucher samples must be labeled with the s
Performed? (Y/N): (If Yes, Record all observations. Vo ID number. Include appropriate field *. Fish Observed? (Y/N) Voucher? (Y/N) Salamande	Aucher collections optional. NOTE: all voucher samples must be labeled with the s d data sheets from the Primary Headwater Habitat Assessment Manual) ers Observed? (Y/N) Voucher? (Y/N) Auguatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
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			Primary I	leadwa		at Evalua IEl Score (s			a II 54
	Stream	~	AMP-OH	<u> </u>	RIVER BASIN		DRA	NAGE AREA (mi²) 🚄	Im;2
	LENGTH OF	STREAM REA 29-05 SC	CH (ft) <u>400 /</u> ORER <u>861/</u>	LAT	LONG MENTS 5478a	RIVE	R CODE	RIVER MILE	
		omplete All It HANNEL	ems On This Form	n - Refer to "	Field Evaluation	m Manual for C	hio's PHWH	Streams" for Instr RECENTIOR NO REC	
ſ	(Ma) <u>TYPE</u>				pes found (Max o		core is sum of		HHEI Metric Points
		BEDROCK [16				PACKWOODY L DETRITUS [3 pt	<b>aj</b>		Substrate Max = 40
	oø/	Cobble (65-25 Gravel (2-64 Sand (<2 mm)	A 1997 A 1998 A 1997 A 19	100% 20%		f or HARDPAN (f K <b>[0 pts]</b> FICIAL <b>[3 pts]</b>	i pti 🦾 🔭 🥍 Sanana ang s	≥ <u>√15%</u> 	19
			entages of Cobble, Bedrock EDOMINATE SUBS		15	TOTAL NUMBER	OF SUBSTRA		A+B
	eval				m water pipes)		ne box): s]		Pool Depth Max = 30
						MAXIMUM POC			<b>Baokfuli</b>
		meters (> 13') [3 m - 4.0 m (> 9'	H (Measured as the 10 pts] 7" - 13") [26 pts] 7" - 4"8") [20 pts]			(Cnack 9 m ⊱1,5 m (>3:3 0 m (≤ 3*3*) (5 ph	ONLY one bo: -4/6") [15.pts 1		Width Max=30
	con	AMENTS				_ AVERAGE BA	NKFULL WIDT	H (meters)	6
	L M 01	RIPARIAN R (Per Bani	k) )m	LAIN QUALIT FLOODPLA L/R (N L/R (N L/R (N L/R (N) L/R (N) L	Y STNOTE: R IN QUALITY Aost Predominant ature Forest, Wal mature Forest, S	per Bank) Jand	ight (R) as lool	ting downstreams Conservation Tillage Joban or Industrial	<b>.</b>
					ield esidential, Park, I enced Pasture	lew Field		Open Pasture, Row Crop Aining or Construction	·
		FLOW REG Stream Flowi	IME (At Time of Eval Ing iow with isolated pool		k ONLY one box)			a, no flow (intermittent) meral)	
	8	SINUOSITY None 0.5	(Number of bends pr	≨r 61 m (200 ft) 1.0 1.5	of channel) (Cl	neck ONLY one bo 2.0 2.5	×):	3.0 >3	
	STR Flat (0.5 ft	EAM GRADIEN	Flat to Moderate		e (2 1/100 ft)	Moderate to	Severe	Savere (10 10/10	0 ft)

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ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):
QHEI PERFORMED? - 🗍 Yes 🕅 No QHEI Score (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)         WWH Name:       Distance from Evaluated Stream         CWH Name:       Distance from Evaluated Stream         EWH Name:       Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: New Haven, WV-OH NRCS Soil Map Page: NRCS Soil Map Stream Order
county: MCKS Corry Township/City: Letart Salle, Ohio area
MISCELLANEOUS
Base Flow Conditions? (Y/N): N Date of last precipitation: 11-29-05 Quantity: UNKnown
Photograph Information:
Elevated Turbidity? (YIN): Canopy (% open):75 %
Were samples collected for water chemistry? (Y/N): <u>V</u> (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U ) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) / If not, please explain:
Additional comments/description of pollution impacts:
BIOTIC EVALUATION Performed? (Y/N):
Fish Observed? (Y/N)       Voucher? (Y/N)       Voucher? (Y/N)         Frogs or Tadpoles Observed? (Y/N)       Voucher? (Y/N)       Voucher? (Y/N)         Comments Regarding Biology:       Voucher? (Y/N)       Voucher? (Y/N)
DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):
Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location
FLOW

5-5

		-	ter Habitat Eva HHEI Sco	aluation For ore (sum of metric		- I 7
Strea LENGTH OF S DATE <u>11-2</u>	STREAM REACH (ft) <u>QC</u> <u>89-05</u> SCORER <u>I</u> mplete All Items On T TANNEL <b>QT</b> NC	MBER <u>5-6</u> <u>0</u> LAT. <u>B</u> <u>C</u> M COMM This Form - Refer to "	RIVER BASIN LONG IENTS <u>5 frea.m 5 flow</u> Field Evaluation Manual EL TREGOVERED T	RIVER CODE <u>JS</u> Th <u>rough</u> We I for Ohio's PHWH \$	RIVER MILE CEL + 1970 Str Streams" for Instr	em 4 uctions
(Max TYPE B C C C C C C C C C C C C C C C C C C		of significant substrate type PERCENT pts] pts] downward by the substrate type pts] downward by the substrate type downward b	CLAY OF HARDF	PODY DEBRIS [3 pts] 3 [3 pts] 24N <b>1</b> 0 pt	$\begin{array}{c} \text{cxes A \& B.} \\ \hline PERCENT \\ \hline \hline 15 \% \\ \hline \hline 35 \% \\ \hline \hline \hline \end{array}$	HHEI Metrie Points Substrat Max = 44 2 A + B
evalu 30.0 22.5 0 > 10 - COM		from road culverts or stor	measurements) (C	NLY one box): [15 pts] R MOIST CHANNEL [0 IM POOL DEPTH (cent Check ONLY one box):	pts]	Pool Dep Max = 34
□ > 3.0 m □ > 1.5 m	neters (> 13') [30 pts] 0 - 4.0 m (> 9' 7" - 13') [25 1 - 3.0 m (> 9' 7" - 4' 6") [2 MENTS	pts] 9 pts]	A 510m(\$33	(* 3' 3' - 4'8') [15 pte] ) [8 pte] 3E BANKFULL WIDTH	42 27	Width Max=30
	RIPARIAN WIDTH (Per Bank) Wide >10m Moderate 5-10m Narrow <5m			LR Ca Ca Ca Ca Ca Ca Ca Ca Ca Ca	nservation Tillage ban or Industrial	
Ø		ne of Evaluation) (Check lated pools (Interstitial)	🛄 🛛 Moist Cl	hannel, isolated pools, i nnel, no water (Ephem		
	SINUOSITY (Number of None 0.5	f bends per 61 m (200 ft)	of channel) (Check ONLY J. 2.0 2.5	· · · · · · · · · · · · · · · · · · ·	3.0 >3	

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ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed)	-
	ttach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
3 CWH Name:	
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MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE <u>ENTIRE</u> WATERSHE	
JSGS Quadrangle Name: New Klanen, WV-04 NRCS Soil Mar	
county: <u>Meigl County</u> Township/City: Ke	tart Iallo, Ohio area
MISCELLANEOUS	
Base Flow Conditions? (Y/N): N Date of last precipitation: 11-27-05	Quantity: unknown
Photograph Information:	
Elevated Turbidity? (Y/N): N Canopy (% open): 50 %	
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id	and attach results) Lab Number:
Field Measures: Temp (*C) Dissolved Oxygen (mg/l) pH (S.U.)	Conductivity (µmhos/cm)
s the sampling reach representative of the stream (Y/N) If not, please explain:	
BIOTIC EVALUATION Performed? (Y/N): (If Yes, Record all observations. Voucher collections option ID number. Include appropriate field data sheets from the I	
Performed? (Y/N):	Primary Headwater Habitat Assessment Manual)
Performed? (Y/N):	Primary Headwater Habitat Assessment Manual)
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Performed? (Y/N):	Primary Headwater Habitat Assessment Manual) Voucher? (Y/N) rates Observed? (Y/N) Voucher? (Y/N) REACH (This must be completed):

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SITE NA		AMP-OH	<u>.</u>		· · - · · · · · · · · · · · · · · · · ·			
<u> </u>	ram	_SITE NUMBER	5-7	RIVER BASIN		DR	AINAGE AREA (mi²)	lmi
	H OF STREAM READ		_LAT	LONG.	RIVER		RIVER MILE Into Stream 5	
							/H Streams" for Instr	
		A					RECENTIORING RECO	
ter anna an a	AM CHANNEL FICATIONS							
1.		al number of signific	ant substrat	e types found (Max of				HH Me1
	BLDR SLABS [		ERCENT		3 pt)		PERCENT	Poi
	a balan sector a sector and the sect				PACKWOODY DE DETRITUS: [3 pts]		a) <u> </u>	Subs
00	a set of second seco	CREATING SALANYA SALANYA DA L		201 - 122 - 122 - 122 - 122 - 122 - 122 - 122 - 122 - 122 - 122 - 122 - 122 - 122 - 122 - 122 - 122 - 122 - 12	or HARDPAN			Max
		Carl and a second s			[0 pts]	$\mathcal{L}_{ij}$ ,		17
00		<u></u>	• • •		ICIAL <b>[3 pts]</b>			
	Total of Perce Bidr Slabs, Boulder,	Cobble, Bedrock	$()^{0}/_{0}$	<sup>(A)</sup> 3			(18)	A+
SCORE	OF TWO MOST PR	EDOMINATE SUBS	TRATE TYP	ES: <b>Innend</b> Ti	OTAL NUMBER O	FSUBST		
		ومفسيقية الأستاب عنكت بفنصنعت						
2				of depth within the 6 storm water pipes)			ach at the time of	
	evaluation. Avoid pli > 30 centimeters [20	unge pools from road pts]		storm water pipes)	(Check ONLY one m = 10 cm [15 pts]	box):	ach at the time of	
	evaluation. Avoid pl	unge pools from road pts] its]		storm water pipes)	(Check ONLY one	box):		
	evaluation. Avoid pli > 30 centimeters [20 > 22.5 - 30 cm [30 p	unge pools from road pts] its]		storm water pipes)	(Check ONLY one m - 10 cm <b>[15 pts]</b> m <b>[5 pts]</b>	box): CHANNE	L-10 pts)	
3	evaluation. Avoid pl > 30 centimeters [20 > 22.5 - 30 cm [30 p > 10 - 22.5 cm [25 p COMMENTS BANK FULL WADTH	unge pools from road pts] ts] ts] ts] ts]	d culvents or	storm water pipes)	(Check ONLY one m = 10 cm [15 pts] m [5 pts] VATER OR MOIST MAXIMUM POOL (Check O	box): CHANNE . DEPTH ( NLY one t	centimeters):	Pool [ Max
	evaluation. Avoid pl > 30 centimeters [20 > 22.5 - 30 cm [30 p > 10 - 22.5 cm [25 p COMMENTS BANK FULL WIDTH > 4.0 meters (> 13') [3	unge pools from road pts] ts] ts] ts] ts] ts] ts] ts] ts] ts]	d culvents or	storm water pipes) Storm	(Check ONLY one m = 10 cm [15 pts] m [5 pts] VATER OR MOIST MAXIMUM POOL (Check O/ m = 115 m (> 3' 3'	box): CHANNE . DEPTH ( NLY one 1 4'8") (15 ;	LTO posi centimeters):	Max D Bani Wid
	evaluation. Avoid pl > 30 centimeters [20 > 22.5 - 30 cm [30 p > 10 - 22.5 cm [25 p COMMENTS BANK FULL WADTH	unge pools from road pts] ts] ts] ts] ts] ts] ts] ts] ts] ts]	d culvents or	storm water pipes) □ > 5 c □ < 5 c NO V 3-4 measurements) □ > 1.0 < 1.0	(Check ONLY one m = 10 cm [15 pts] m [5 pts] VATER OR MOIST MAXIMUM POOL (Check O	box): CHANNE . DEPTH ( NLY one 1 4'8") (15 ;	LTO posi centimeters):	Max D Bani Wid
	evaluation. Avoid pl > 30 centimeters [20 > 22.5 - 30 cm [30 p > 10 - 22.5 cm [25 p COMMENTS BANK FULL WIDTH > 4.0 meters (> 13') [3 > 3.0 m - 4.0 m (> 9'	unge pools from road pts] ts] ts] ts] ts] ts] ts] ts] ts] ts]	d culverts or	storm water pipes) □ > 5 c □ < 5 c NO V 3-4 measurements) □ > 1.0 < 1.0	(Check ONLY one m = 10 cm [15 pts] m [5 pts] VATER OR MOIST MAXIMUM POOL (Check O/ m = 115 m (> 3' 3'	box): CHANNE . DEPTH ( NL Y one 1 4'8') [15 ;	tree post	Max D Bani Wid
	evaluation. Avoid pl > 30 centimeters [20 > 22.5 - 30 cm [30 p > 10 - 22.5 cm [25 p COMMENTS BANK FULL WIDTH > 4.0 meters (> 13) [3 > 3.0 m - 4.0 m (> 9 > 1.5 m - 3.0 m (> 9	unge pools from road pts] ts] ts] ts] ts] ts] ts] ts] ts] ts]	d culverts or average of	storm water pipes) Storm	(Check ONLY one m = 10 cm [15 pts] m [5 pts] VATER OR MOIST MAXIMUM POOL (Check O m - 1.5 m (> 3 3 m (≤ 3'3") [5 pts] AVERAGE BANK	box): CHANNE . DEPTH ( NL Y one 1 4'8') [15 ;	tree post	Max D Bani Wid
	evaluation. Avoid pl > 30 centimeters [20 > 22.5 - 30 cm [30 p > 10 - 22.5 cm [25 p COMMENTS BANK FULL WIDTH > 4.0 meters (> 13') [3 > 3.0 m - 4.0 m (> 9' > 1.5 m - 3.0 m (> 9' COMMENTS RIPARIAN 2	unge pools from road pts] ts] ts] ts] (Measured as the 0 pts] 7* 13) [28 pts] 7* 24 8*) [20 pts] 7* 24 8*) [20 pts]	average of This PLAIN QUAI	storm water pipes) Storm water pipes) Storm vater pipes) Storm	(Check ONLY one m = 10 cm [15 pts] m [5 pts] VATER OR MOIST MAXIMUM POOL (Check O m - 1.5 m (> 3'3' m (< 3'3') [5 pts] AVERAGE BANK o be completed	box): CHAINNE DEPTH ( WLY one k 4*8*) [15 ; (FULL WI	tree post	Max D Bani Wid
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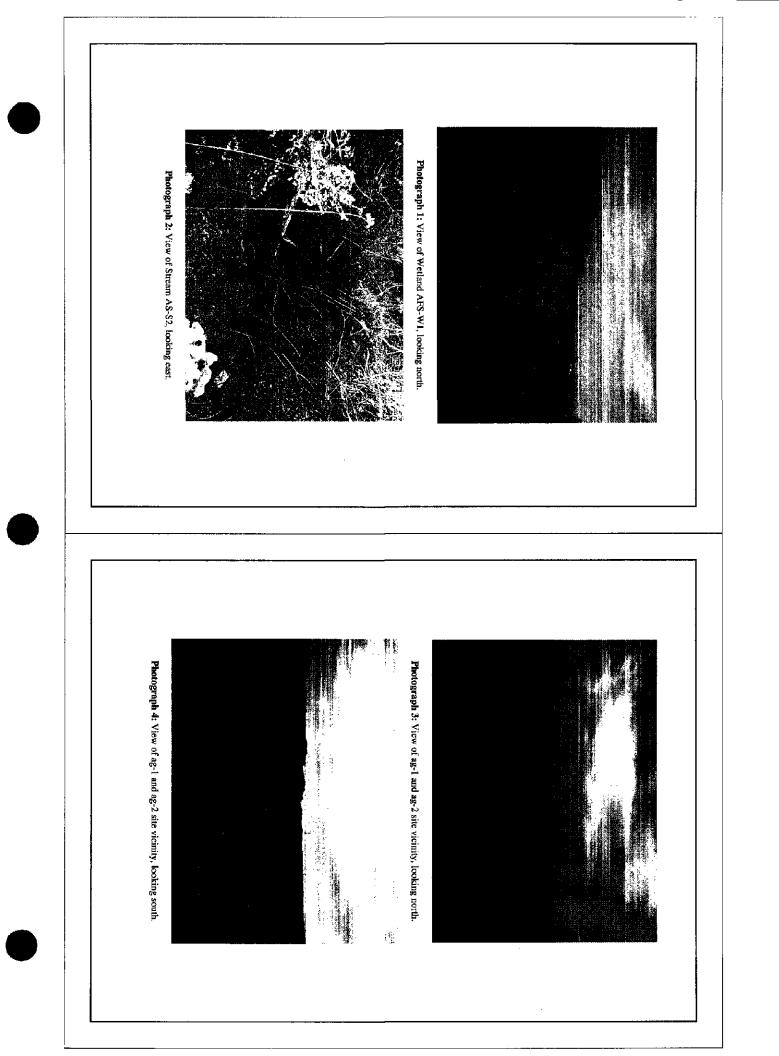
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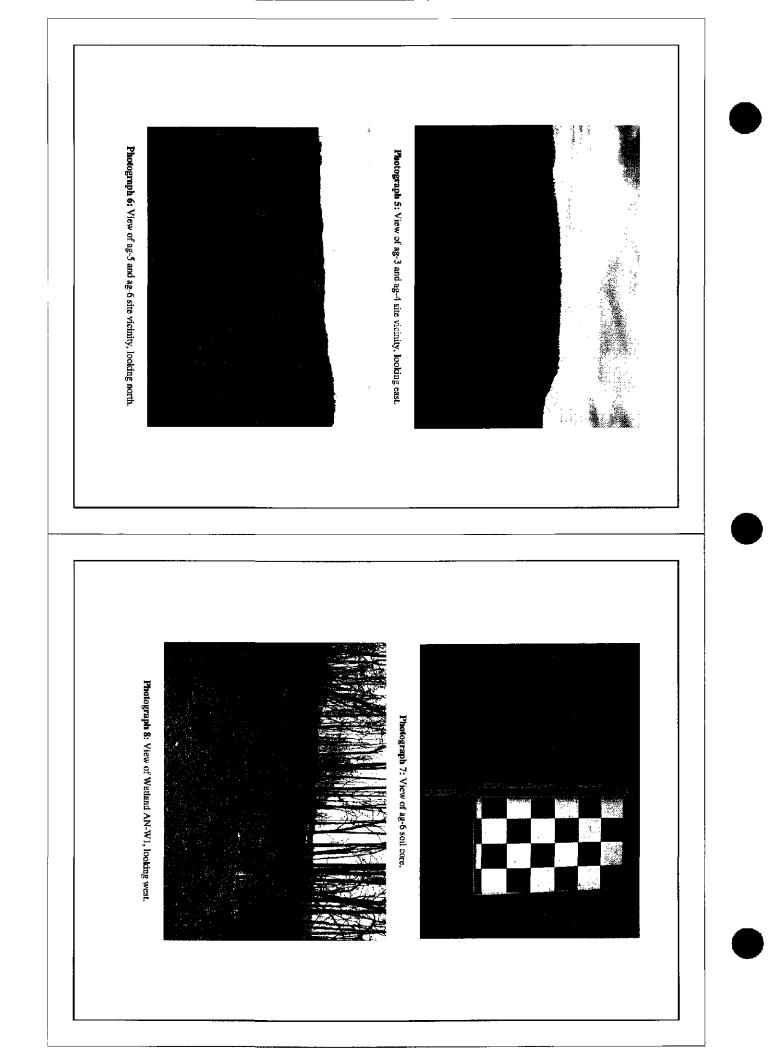
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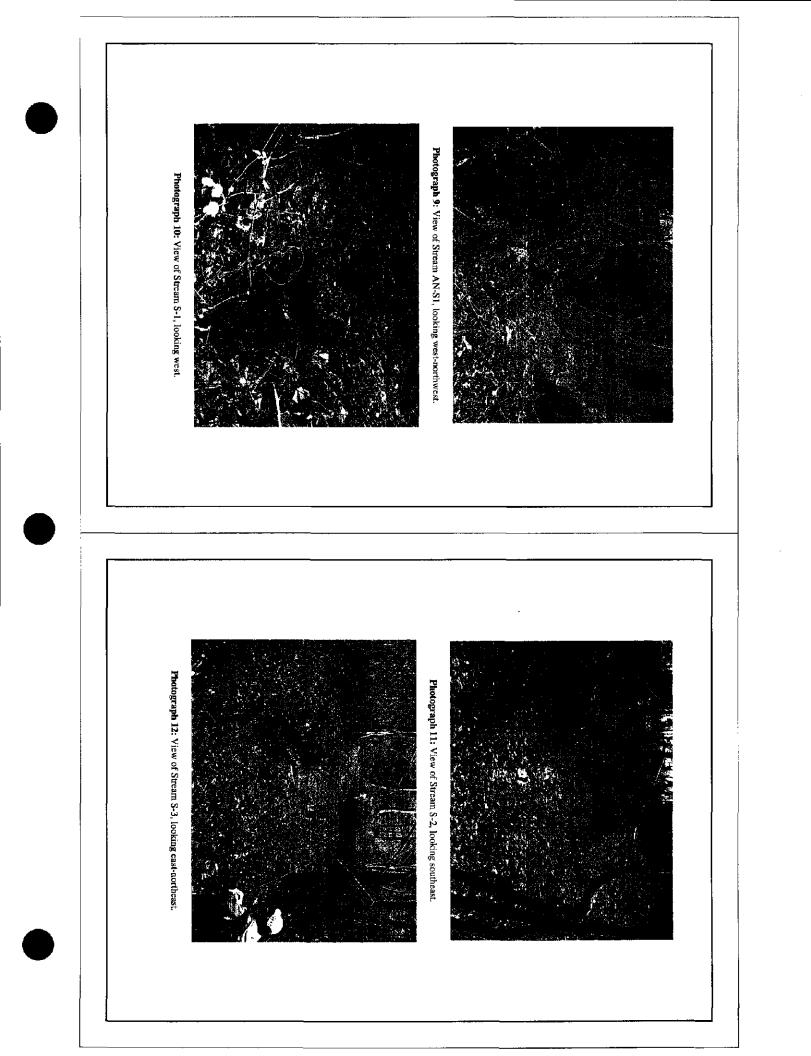
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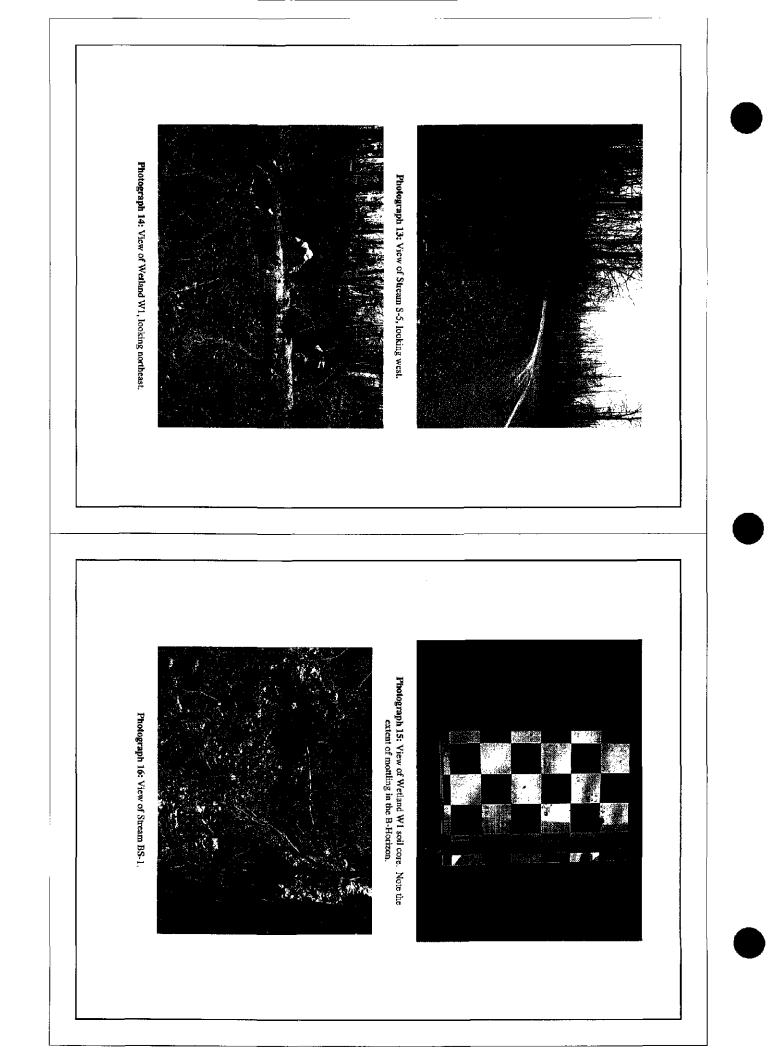
APPENDIX D

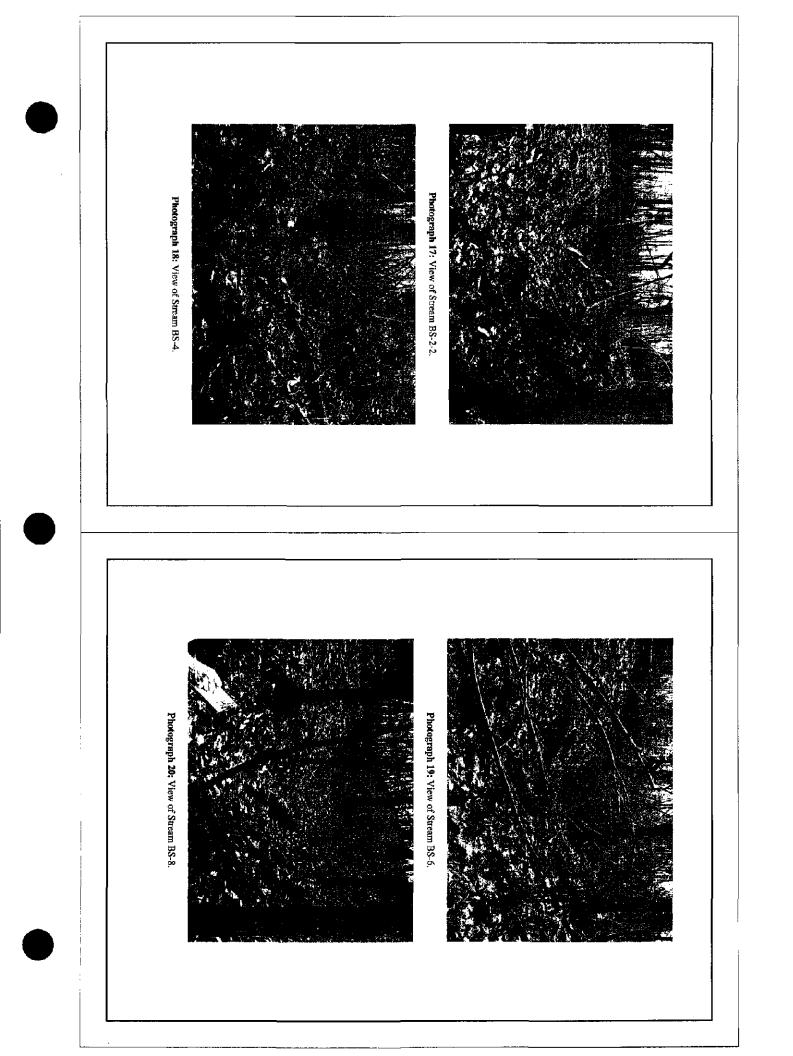
## SELECTED PHOTOGRAPHS

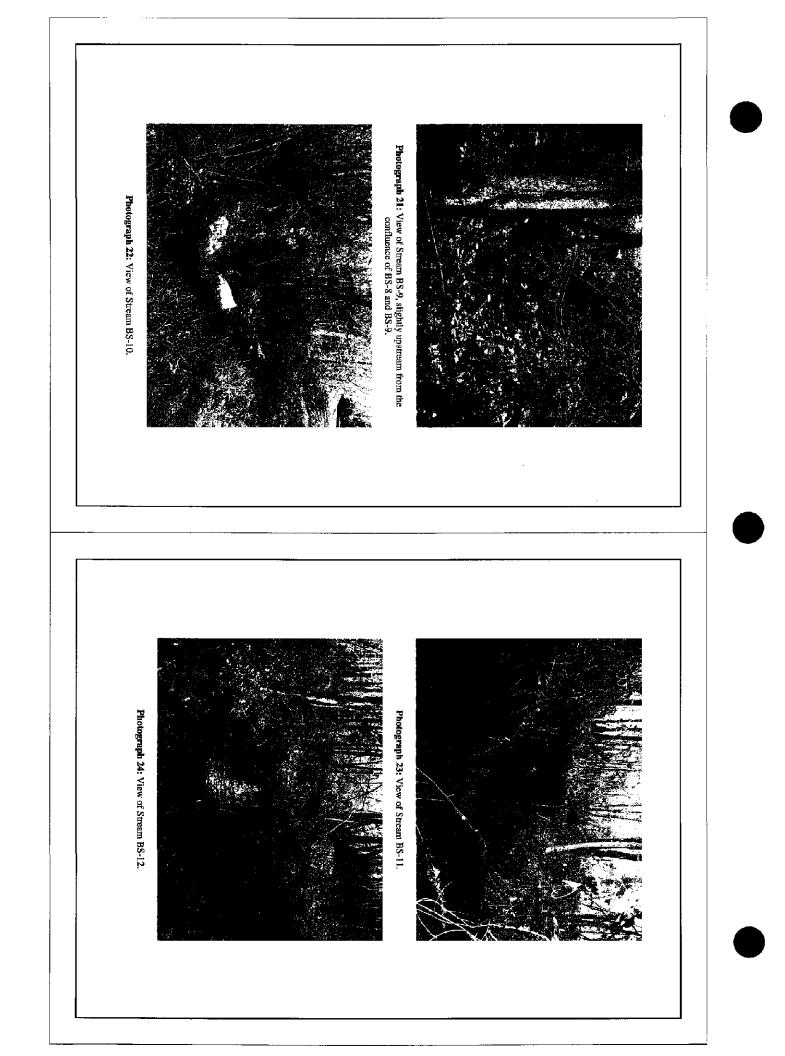


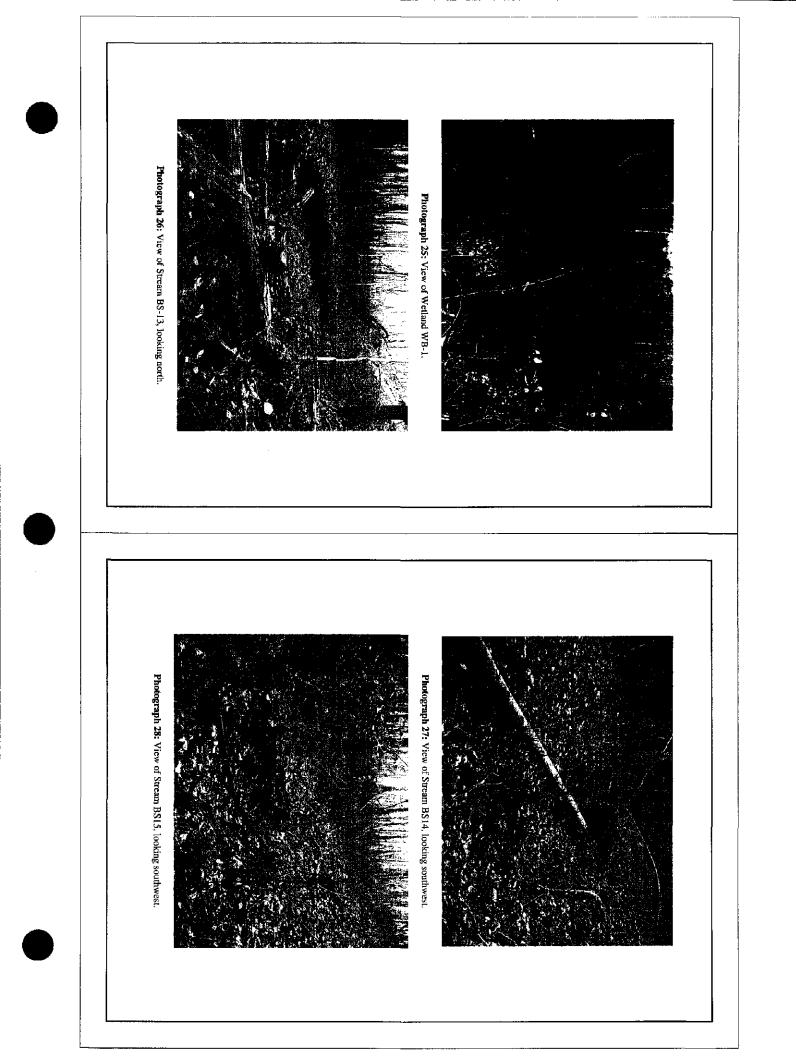


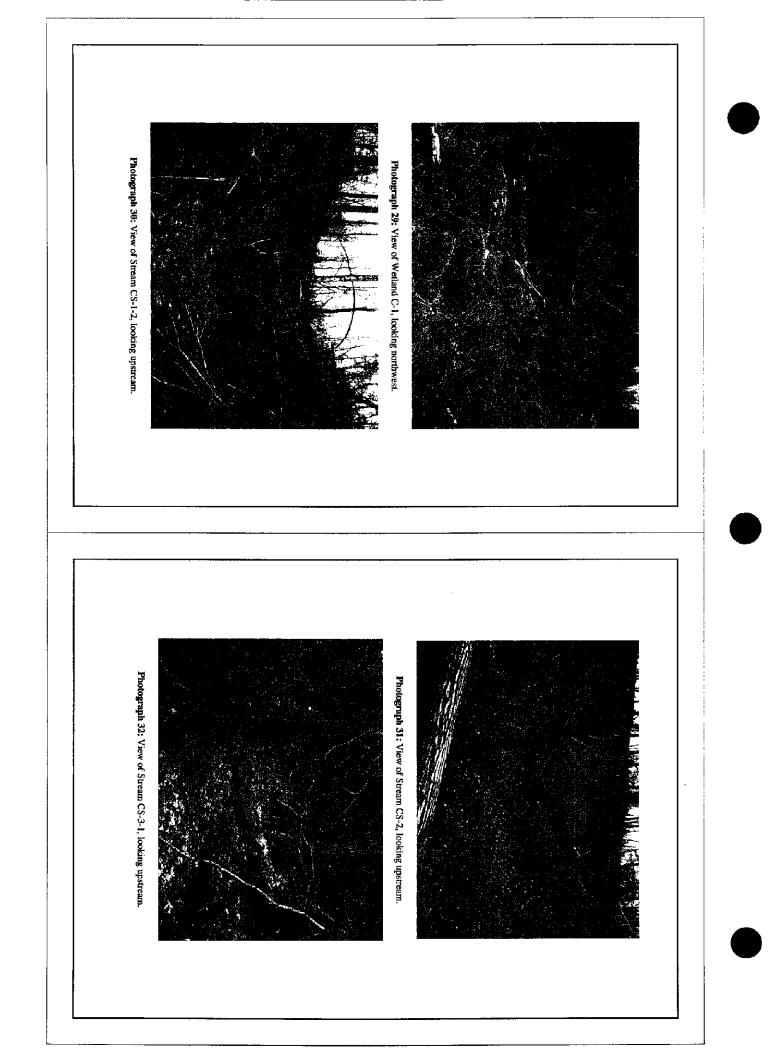


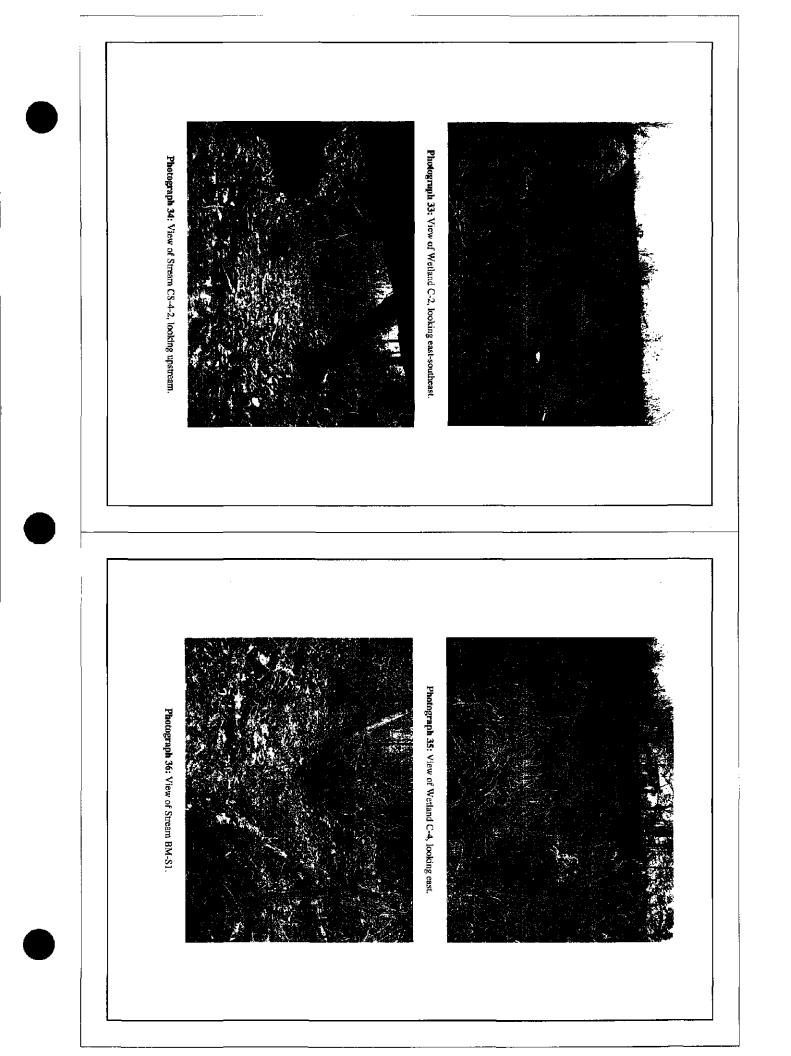


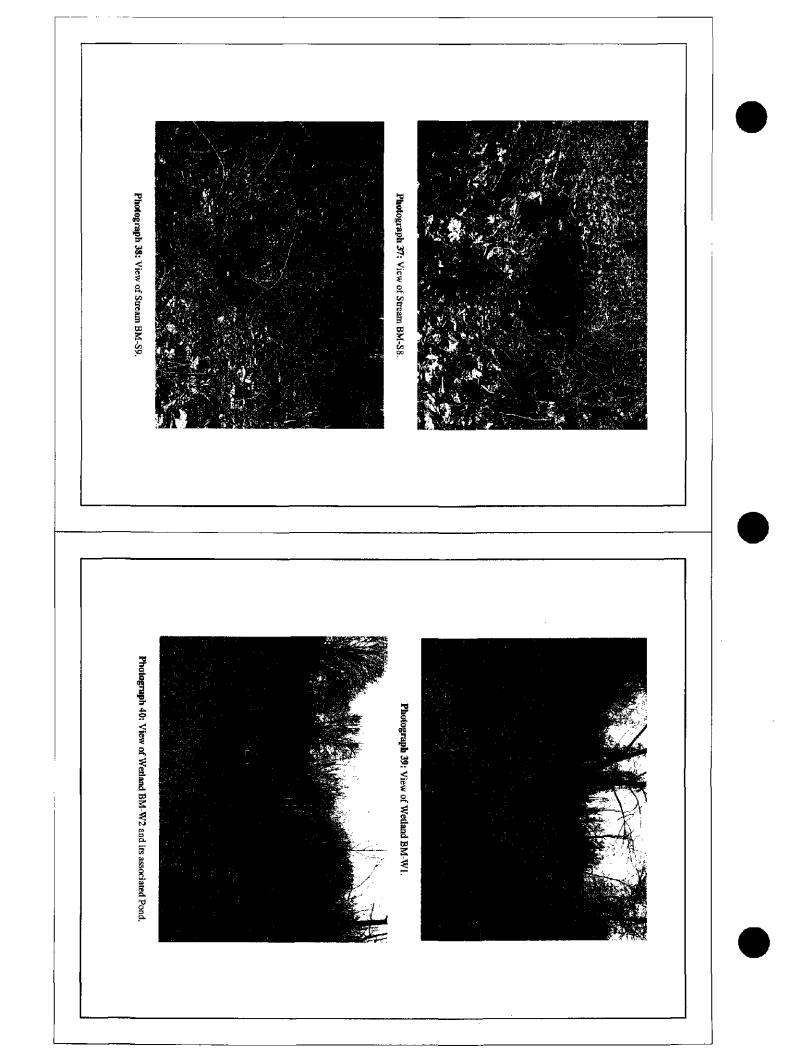


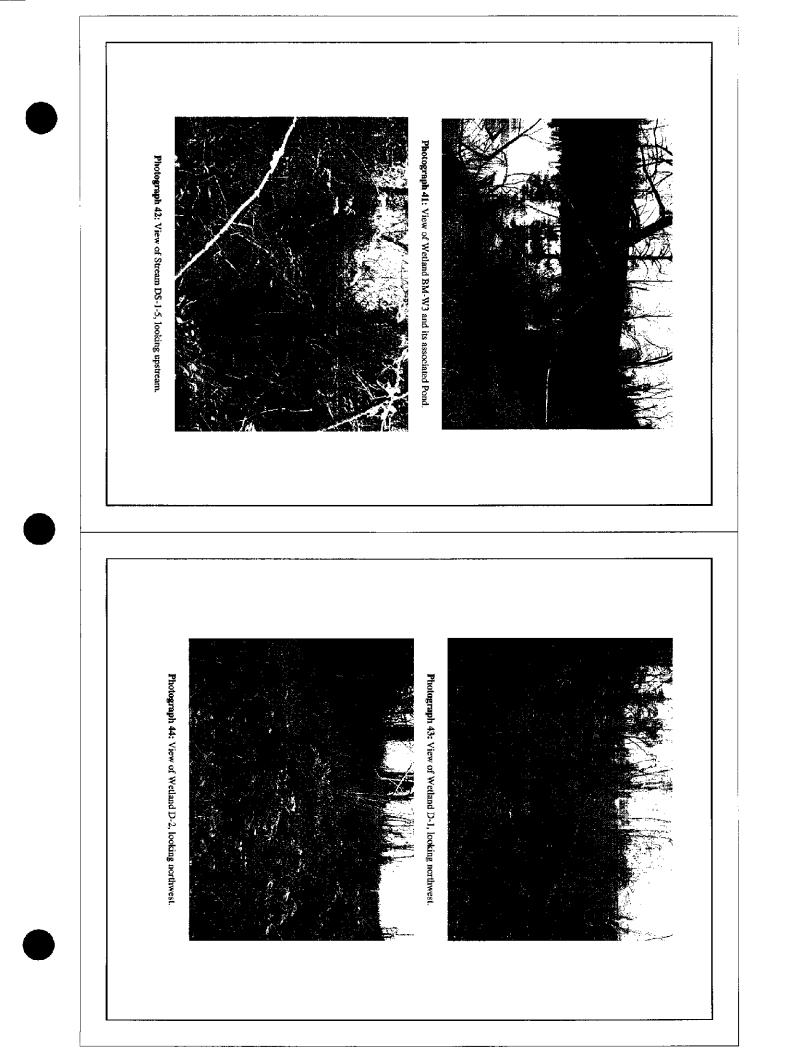


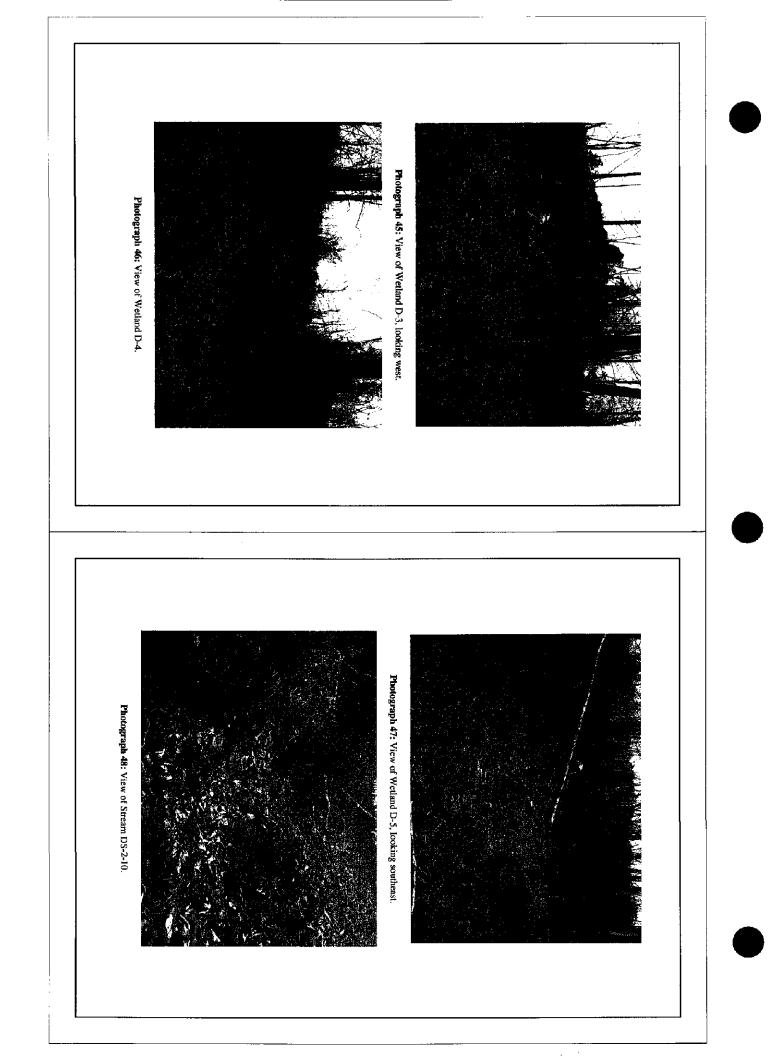


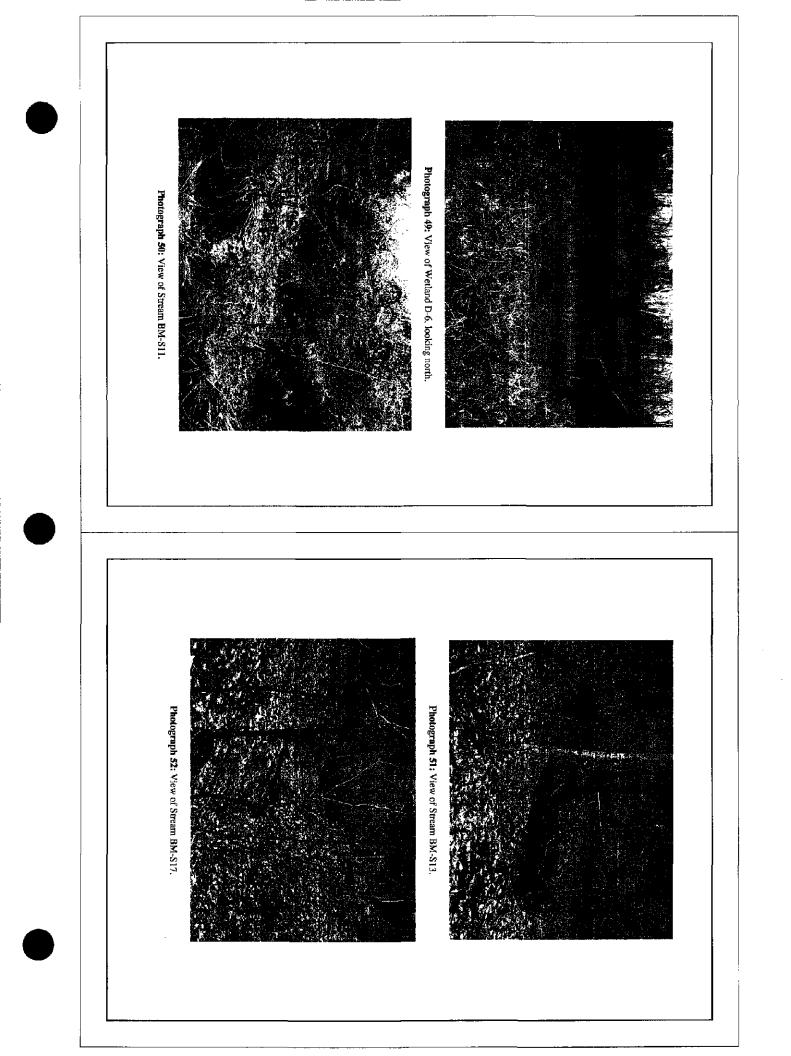


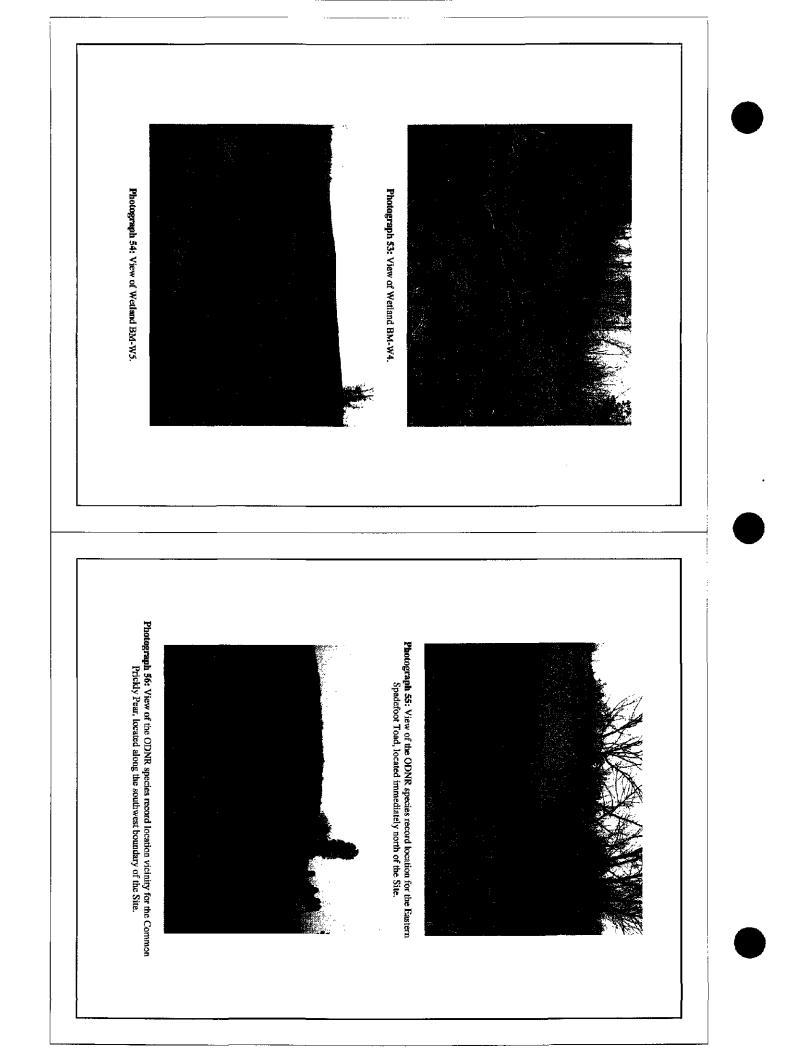












APPENDIX E

# AGENCY CORRESPONDENCE



# **Ohio Department of Natural Resources**

BOR TAFT, GOVERNOR

SAMUEL W. SPECK, DIRECTOR Division of Natural Areas & Preserves Nancy Strayer, Acting Chief 1889 Fountain Square, Bldg. F-1 Columbus, OH 43224-1388 Phone: (614) 265-6453 Fax: (614) 267-3096

May 10, 2004

Rebecca Wilson GT Environmental, Inc. 635 Park Meadow Rd., Suite 112 Westerville, OH 43081

Dear Ms. Wilson:

After reviewing our Natural Heritage maps and files, I find the Division of Natural Areas and Preserves has records of rare or endangered species within 5 miles of the GT Environmental, Inc. Ohio 2 project. The site is in Sutton, Lebanon, and Letart Twps., Meigs Co., New Haven and Ravenswood Quadrangles. The maps I have included with this letter display the locations of these records and correspond with the attached list.

There are no existing or proposed state nature preserves at the project site. We are also unaware of any unique ecological sites, geologic features, breeding or non-breeding animal concentrations, champion trees, state parks, state forests, or scenic rivers within the project area. However the search includes the Racine, Old Town Creek, and Lock and Dam 23 Wildlife Areas. Jim Marshall of the Division of Wildlife should be consulted regarding possible impacts to these areas. He can be reached at (614) 594-2211.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although we inventory all types of plant communities, we only maintain records on the highest quality areas. Also we do not have data for all Ohio wetlands. The Division of Wildlife has a statewide wetland inventory that can give you additional data. Their phone number is (614) 265-6300. For National wetlands Inventory maps, please contact Madge Fitak in the Division of Geological Survey at (614) 265-6576. Aerial photos may be obtained from ODOT at (614) 275-1369. USGS maps can be requested directly from the U.S. Geological Survey at 1-888-275-8747.

Please contact me at (614) 265-6409 if I can be of further assistance.

Sincerely,

Butch Grieszmer, Data Specialist Resource Services Group



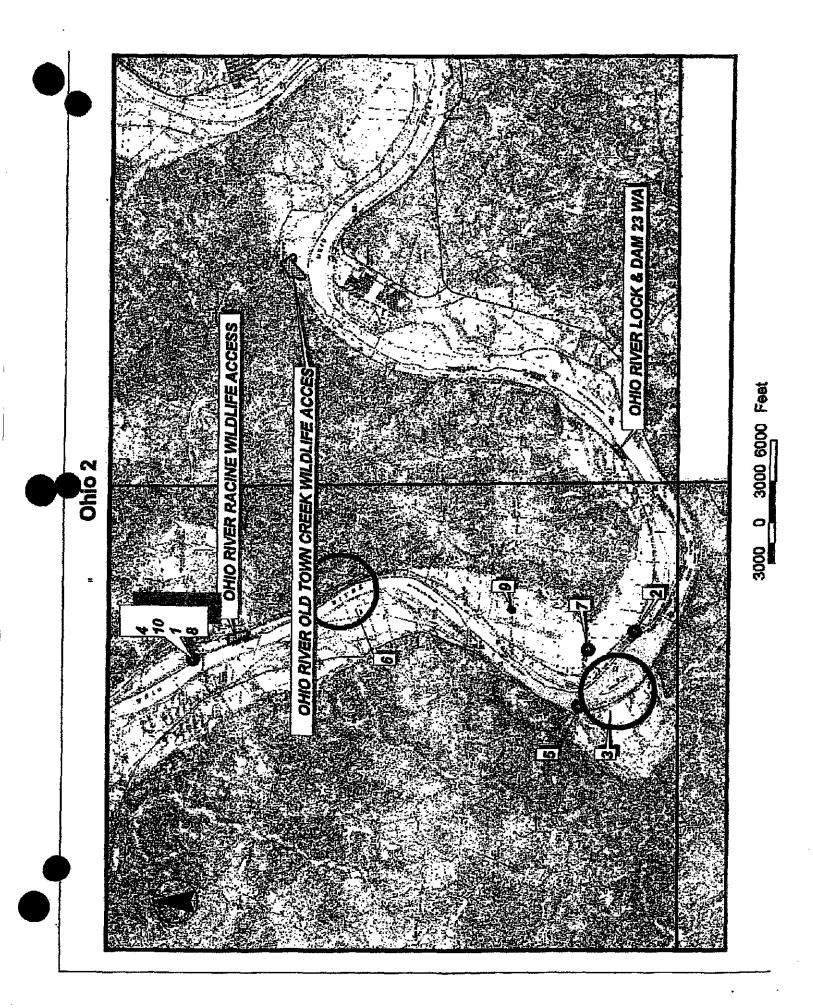
# GT Environmental, Inc. Ohio 2 Project

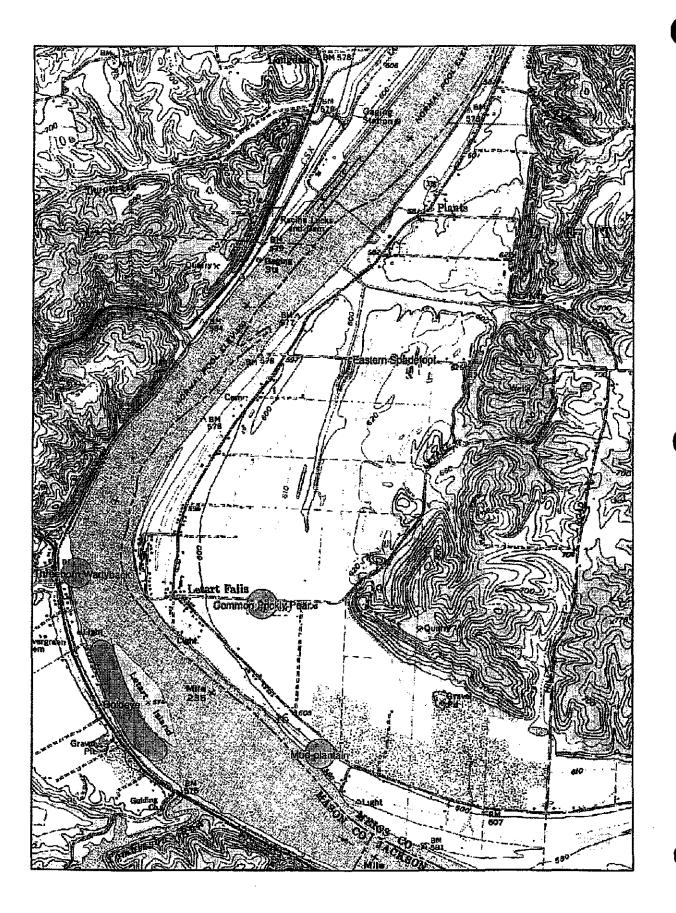
	Scientific Name	Common Name	State Status	Federal Status
•	Cicindela marginipennis	Cobblestone Tiger Beetle	Т	
2	Heteranthera reniformis	Mud-plantain	E	
3	Hiodon alosoides	Goldeye	E	
4	Macrhybopsis aestivalis	Speckled Chub	E	
5	Obliquaria refiexa	Threehom Wartyback	т	
6	Obliquaria reflexa	Threehorn Wartyback	Т	
7	Opuntia humifusa	Common Prickly Pear	P	
8	Percina copelandi	Channel Darter	Т	
9	Scaphiopus holbrookii	Eastern Spadefoot	E	,
10	Spermacoce glabra	Smooth Buttonweed	P	





E=Endangered FE=Federally Endangered FT=Federally Theatened P=Potentially Threatened SC=Special Concern SI=Special Interest T=Threatened Page 1 of 1





### ADDENDUM TO THE WETLAND DELINEATION, STREAM ASSESSMENT, AND THREATENED AND ENDANGERED SPECIES HABITAT SURVEY

July 31, 2006

Lee Pittman U.S. Army Corps of Engineers-Huntington District 502 Eighth Street Huntington, WV 25701

Mike Smith Ohio EPA Division of Surface Water 401 Section **122 South Front Street** Columbus, Ohio 43215

#### American Municipal Power Generating Station: RE: Submittal of Addendum to the Wetland Delineation, Stream Assessment, and Threatened and Endangered Species Habitat Survey

Attached please find an Addendum to the Wetland Delineation, Stream Assessment, and Threatened and Endangered Species Habitat Survey ("Report") prepared by URS on behalf of American Municipal Power-Ohio, Inc. ("AMP-Ohio") for AMP-Ohio's American Municipal Power Generating Station project in Meigs County, Ohio.

If you have any comments on this Report, please do not hesitate to contact me at your earliest convenience at 614-337-6222. In addition, if you have specific technical questions, please feel free to contact James Nicholas at URS directly at 513-419-3407.

Sincerely,

Scott Kiesewetter Manager of New Plant Engineering American Municipal Power-Ohio, Inc.

Attachment cc: Jerry Jones, AMP-Ohio, James Nicholas, URS



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Municipal Power-Ohio, Inc



AMP-Ohio 2000 Auport Drive Columbus, Ohio 33210 • Phones 614/337-6222 • Fast 614/337-6220 • Avianamp oblig.org

# URS

June 19, 2006 Ms. Lee Pittman Regulatory Branch U.S. Army Corps of Engineers, Huntington District 502 Eighth Street Huntington, West Virginia 25701-2070

#### Re: Comments on Wetland Delineation, AMP-Ohio Coal-Fired Generation Facility, Letart Falls, Ohio

Dear Ms. Pittman:

URS is pleased to provide the attached addendum to the wetland delineation, stream assessment, and threatened and endangered species habitat report for the AMP-Ohio project site in the Letart Falls area of Meigs County, Ohio. Each of the comments provided by Ms. Lee Pittman of the USACE and Mr. Mike Smith of OEPA 401 Section during the May 12, 2006 site visit were considered when making changes to the original report. This addendum supersedes the original wetland delineation, stream assessment, and threatened and endangered species habitat report, however, any conclusions drawn from the original report have not changed. A summary list of the changes addressed in the addendum is provided below. Figures, photographs, and data forms are included in the appendix to the attached addendum.

- 1) The jurisdictional limit of Stream bs-1-3 was extended approximately 130 feet west-northwest, as shown on Revision 1, Figure 3B.
- 2) The jurisdictional limit of Stream bs-8 was extended approximately 800 feet northwest, as shown on Revision 1, Figure 3B.
- 3) Ohio EPA observed a salamander in Stream bs-13 during the May 12, 2006 site visit and commented upon the unusual presence of a pool in a headwater stream. Therefore, Ohio EPA believes Stream bs-13 should be classified as a Class III headwater stream. Stream bs-13 was classified as a Class III headwater stream in the original wetland delineation, stream assessment, and threatened and endangered species survey report, dated March 2006.
- 4) URS identified Wetland d-6 in the wetland delineation report, dated March 2006, as a Palustrine open water/emergent (POW/PEM) wetland area. During the May 12, 2006 site visit, it was stated that the jurisdictional limits of this wetland needed to be revised. Pursuant to these comments, the central portion of this previously delineated wetland has been excluded as jurisdictional wetland. An emergent jurisdictional wetland fringe has been identified along the edge of this open water pond, as shown on Revision 1, Figure 3B.

URS Corporation 36 East Seventh Street, Suite 2300 Cincinnati, OH 45202 Tel: 513-651-3440 Fax: 513-651-3452 WWW.urscorp.com



Ms. Lee Pittman June 19, 2006 Page 2

- 5) The jurisdictional limit of Stream bm-s18 was shortened by approximately 200 feet, as shown on Revision 1, Figure 3C.
- 6) During the May 2006 site visit, it was determined that the character and class of Stream bm-s13 changes the Site from Class III to Class II headwater stream. A second HHEI evaluation, identified as bm-s13b, was performed upstream of HHEI sampling location bm-s13 to document this change. Stream bm-s13b scored 55/100, which is indicative of a Class II headwater stream. The HHEI data sheet for this stream and photograph are provided in the appendix to the addendum.
- 7) URS identified an additional wetland (Wetland d-7) during the May 2006 site visit that was not previously identified in the Wetland Delineation Report. Wetland d-7 was identified approximately 220 feet south of Wetland c-2, as shown on Revision 1, Figure 3C. The ORAM score for this wetland was 28/100, which is indicative of a Category 1, or low quality wetland. The USACE and ORAM data sheets for this wetland and accompanying photograph are provided in the appendix to the addendum.

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Please review the enclosed materials and call James Nicholas (513-419-3407) if you have any questions pertaining to the attached addendum or to the wetland delineation, stream assessment, and threatened and endangered species habitat survey report.

Sincerely, URS Corporation

Von Dart

Joey Van Skaik Environmental Scientist

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James Nicholas, Ph.D. Project Manager

#### Addendum to the Wetland Delineation, Stream Assessment, and Threatened and Endangered Species Habitat Survey, Proposed AMP-Ohio Coal Fired Generation Power Plant Site, Meigs County, Ohio

This is an addendum to the original wetland delineation report, stream assessment, and threatened and endangered species habitat survey conducted in November and December, 2005. This addendum supersedes the original report and is based on the field review conducted by URS, USACE, and OEPA in May, 2006. Summary tables of the wetlands and streams encountered in the field survey and review follow the text. Figures, photographs, and data forms for the revisions made to the original report are included in the attached appendix. All other figures, photographs, and data forms can be found in the original report, dated March 2006.

URS conducted a jurisdictional wetland delineation, stream assessment, and threatened and endangered species survey of an approximately 1,000-acre site, located in the Letart Falls area, Meigs County, Ohio. AMP Ohio is proposing construction of a 1,000 megawatt (MW), coal fired electric generating facility at the Site along with a coal combustion by-products landfill, and a barge dock and unloading facility. Site delineation and assessment work began November 28, 2005 and was completed December 2, 2005. A field review was conducted on May 12, 2006 by URS, USACE, and OEPA.

Twenty-two wetlands, including 5 different Cowardin wetland types were identified within the project study area, including 15 palustrine emergent wetlands, 2 palustrine emergent/scrub-shrub wetlands, 2 palustrine emergent/forested wetlands, 1 palustrine open water wetland, and 2 palustrine open water/emergent wetlands. Identified wetlands were evaluated utilizing ORAM v5.0 qualitative evaluation method for categorizing wetlands. The ORAM scores for the wetlands indicated the following: 6 Category 1 emergent wetlands, 1 Category 1 wetland with emergent and forested components, 9 Category 2 emergent wetlands, 2 Category 2 wetlands with emergent and scrub-shrub

1

components, 1 Category 2 wetland emergent and forested components, 1 Category 2 open water wetland, and 2 Category 2 mixed emergent/open water wetlands. No Category 3 wetlands were identified during the November and December field investigation or the May field review.

Sixty-eight primary headwater habitat evaluations (HHEI) were conducted on the sixtyseven streams identified within the limits of the study area. The survey identified the following HHEI stream classes: 23 Class I streams, 7 Modified Class I streams, 20 Class II streams, 7 Modified Class II streams, and 10 Class III streams.

ODNR-DNAP reported 10 records of rare or endangered species within 5 miles of the Site. Of these ten species records, ODNR identified records of the Eastern Spadefoot Toad (*Scaphiopus holbrookii*) and the Common Prickly Pear (*Opuntia humifusa*) in the immediate project vicinity. The USFWS literature review indicated that the proposed project is located within the range of the federally endangered Indiana bat (*Myotis sodalis*) and three federally endangered species of mussels. These mussel species include the pink mucket pearly mussel (*Lampsilis orbiculata*), the fanshell mussel (*Cyprogenia stegaria*), and the sheepnose mussel (*Piethobasus cyphyus*). None of theses species of concern were identified during the November and December field investigation or the May field review. However, potential habitat for the Indiana Bat, Eastern Spadefoot Toad, and several aquatic species of concern were identified during the field investigation.

2

#### SUMMARY TABLE OF WETLANDS AT THE AMERICAN MUNICIPAL POWER-OHIO (AMP-OHIO) LETART FALLS, OHIO PROPOSED COAL FIRED GENERATION POWER PLANT SITE

			ORAM		
Wetland Identifier	Cowardian Wetland Type	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		Mapped P Soit*	Observed Soil
afs-wl	PEM	0.06	8(1)	No	sandy loam
an-wi	PEM/PSS	<u> </u>	38 (2)	LaB/LaD	silty clay
bm-wl	PEM	0.07	27 (1)	UgD	silty loam
bm-w2	PEM	0.33	35 (2)	UgE	silty loam
bm-w3	PEM	0.18	39 (2)	UgD/UgE	silty loam
bm-w4	POW/PEM	0.07	43 (2)	UgE	silty clay loam
bm-w5	PEM	0.27	38 (2)	UgD	silty loam
c-1	PEM	0.02	24 (1)	UgD/UgE	loam
c-2	PEM	0.04	37 (2)	UgD	sandy silty loam
c-3	PEM	0.01	32.5 (2)	UgE	silt
c-4	PEM	0.02	23 (1)	UgD	silty clay
d-1	PEM	0.03	39.5 (2)	UgD	silty clay
d-2	PEM	0.15	38 (2)	UgD	loam
d-3	PEM/PFO	0.11	27 (1)	UgD/UgE	loam
d-4	PEM/PFO	0.07	44 (2)	UgD/UgE	clay loam
d-5	PEM	0.02	37 (2)	UgE	silty clay loam
<u>d-6</u>	POW/PEM	0.09	32 (2)	UgE	silty clay
w-1	PEM/PSS	0.07	44 (2)	UgE	silty clay loam
w-2	PEM	0.18	21 (1)	LaD	sandy loam
wb-1	POW	0.18	43.5 (2)	UgE	clay
w <u>b-</u> 2	PEM	0.09	33.5 (2)	LaD	silty clay
wd-7	PEM	0.08	28 (1)	UgD/UgC2	silty loam
Total wetla	and acreage**	2,32			

\* soil mapped at wetland location

\*\* total is combined acreage of each wetland type: 1.55 acres (PEM); 0.25 acres (PEM/PSS); 0.16 acres (POW/PEM); 0.18 acres (PEM/PFO); and 0.18 acres (POW).

# SUMMARY TABLE OF HEADWATER STREAMS AT THE SITE

Stream Identifier	HHEI Score	HHEI Class	Stream Identifier	HHEI Score	HHEI Class
	[				
an-s1	42	Class II	bs-9	13	Class I
as-si	41	Modified Class II	bs-10	54	Class II
as-s2	41	Modified Class II	bs-11	55	Class III
bm-s1	32	Class II	bs-12	43	Class II
bm-s2	11	Class I	bs-13	86	Class III
bm-s3	11	Class I	bs-14	49	Class II
bm-s4	12	Class I	bs-15	40	Class II
bm-s5	21	Class I	bs-16	47	Class II
bm-s6	41	Class II	<u>cs-1</u>	25	Class I
bm-s7	17	Class I	cs-1-2	69	Class III
bm-s8	11	Class I	cs-2	42	Class II
bm-s9	53	Class II	cs-3-1	47	Class II
bm-s10	16	Class I	cs-3-2	58	Class III
bm-s11	23	Class I	cs-4	34	Modified Class II
bm-s12	36	Class II	cs-4-2	77	Class III
bm-s13b	55	Class II	cs-5-2	23	Modified Class I
bm-s14	55	Class III	сs-б	21	Class I
bm-s15	23	Class I	ds-1-5	45	Modified Class II
bm-s16	40	Class II	ds-1-1 i	22	Class I
bm-s17	35	Class II	ds-2-2	40	Class II
bm-s18	24	Class I	ds-2-5	59	Class III
bm-s19	24	Class I	ds-2-10	52	Class III
bm-s20	33	Class II	ds-3a	17	Modified Class I
bm-s21	23	Class I	ds-3b	17	Modified Class I
bs-1	28	Modified Class I	ds-3c	17	Modified Class I
bs-1-2	40	Modified Class II	ds-4	31	Modified Class II
bs-1-3	29	Modified Class I	s-1	27	Class I
bs-2	48	Modified Class II	s-2	68	Class III
bs-2-2	43	Class II	s-3	81	Class III
bs-3	23	Class I	s-4	37	Class II
bs-4	15	Class I	s-5	64	Class II
bs-5	19	Class I	s-б	12	Class I
bs-6	11	Class 1	s-7	12	Class I
bs-8	16	Modified Class I			



APPENDIX

#### DATA FORM ROUTINE WETLAND DETERMINATION (1987 COE Wellands Delineation Manual)

Project/Site: <u>Rotant Gralle anon</u> Applicant/Owner: <u>AMP-OH</u> Investigator: <u>JN/JAV</u>		Date: <u>5/12/06</u> County: <u>Maist</u> State: <u>Chur</u>
Do Normal Circumstances Exist on the site? Is the site significantly disturbed (Atypical Situation)? Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes No Yes No	Community ID :         PEM           Transect ID:         -           Plot ID:         D-7

#### VEGETATION

Dominant Plant Species Stratum Indicator	Dominant Plant Species	Stratum Indicator
1. Jypha latifalia H_OBL	9	
2 compationis caponesis H FACW	10	
3 Junices efficience H FACW+	II	
. Cared Sp H FAC-OBL	12	
5 toncera japonica H FAC-	13	
· Jopridendron radicine H FAC	14	
7	15	
8	16	
Percent of Dominant Species that are OBL. FACW or FAC (excluding FAC-).	952	
Remarks:		
withand veget	olion	

#### HYDROLOGY

Recorded Data (Describe in Remarks). Stream, Lake, or Tide Gauge Aental Photographs Other No Recorded Data Available	Wetland hydrology Indicators: Primary Indicators: Inundated X Saturated in Upper 12 Inches Water Marks Drift Lines
Field Observations:         Depth of Surface Water.         Depth to Free Water in Pit:         Depth to Saturated Soil:	Sedimant Deposits Drainage Patterns in Wellands Secondary Indicators (2 or more required): Oxidized Root Channels in Upper 12" Water-Stained Leaves Local Soil Survey Data X FAC-Neutral Test Other (Explain in Remarks)
Remarks: westland bydr	ology

SOILS

80ILS	<u>D-7</u>
Map Unit Name UgD - Updur-Hulpun complex, 15 to 25% de (Series and Phase): UgCD - Upshur- Hulpun complex, Drainage Class: etc 15% elgece Field Observation Texonomy (Subgroup): <u>Typic hapludalfa</u> Confirm Mapp	15 Ug D-well
Profile Description:       Maintx Color       Moltile Colors       Moltile       Moltile       Texture, C         Depth       (Munsell Moist)       (Munsell Moist)       Moltile Colors       Moltile       Abundance/Contrast       Structure,         O-5 <sup>n</sup> A       107R <sup>6</sup> /2       57R <sup>5</sup> /8       c/m       sutty         5-10 <sup>n</sup> B       107R <sup>6</sup> /2       57R <sup>5</sup> /8       c/m       sutty	Concretions, elc <u>f loam</u> <u>loam</u>
Hydric Soil Indicators:      Concretions        Histosol      Concretions        Histic Epipedon      High Organic Content in Suria ce La        Suttidic Odor      Organic Streaking in Sandy Soils        Aquic Moistura Regime      Listed on Local Hydric Soils List        X Reducing Conditions ·      Listed on National Hydric Soils List        X Glayed or Low-Chroma Colors      Other (Explain in Remarks)	yer Sandy Solls
Remarks: Mydric sail core	

#### WETLAND DETERMINATION

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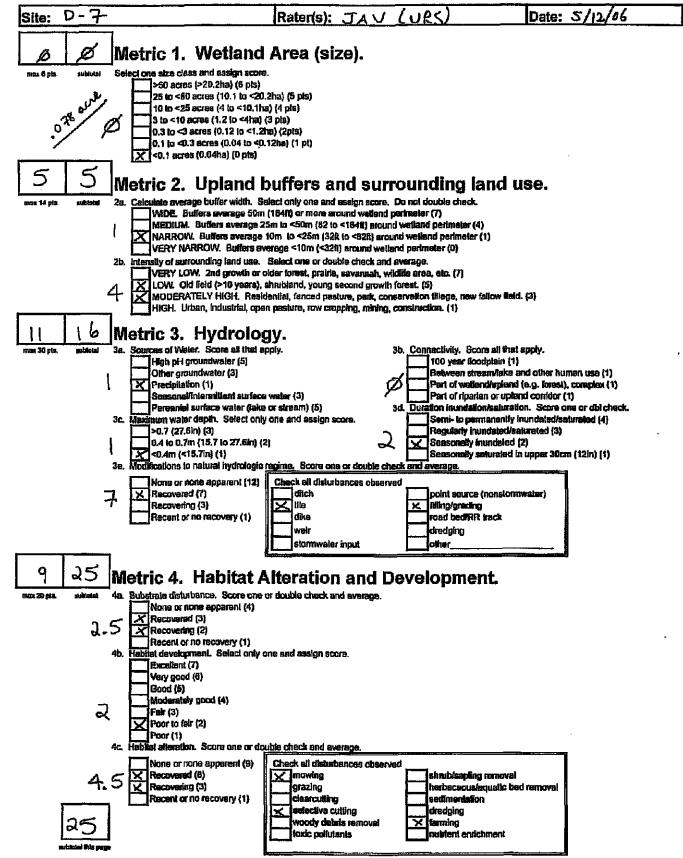
Hydrophytic Vegetation Present? Wetland Hydrology Present? Hydric Soils Present?	999	No No No	(Circie)	Is this Sampling Point Within a Welland? (	(Circle) Yes No
Remarks:					

Approved by HQUSACE 3/92

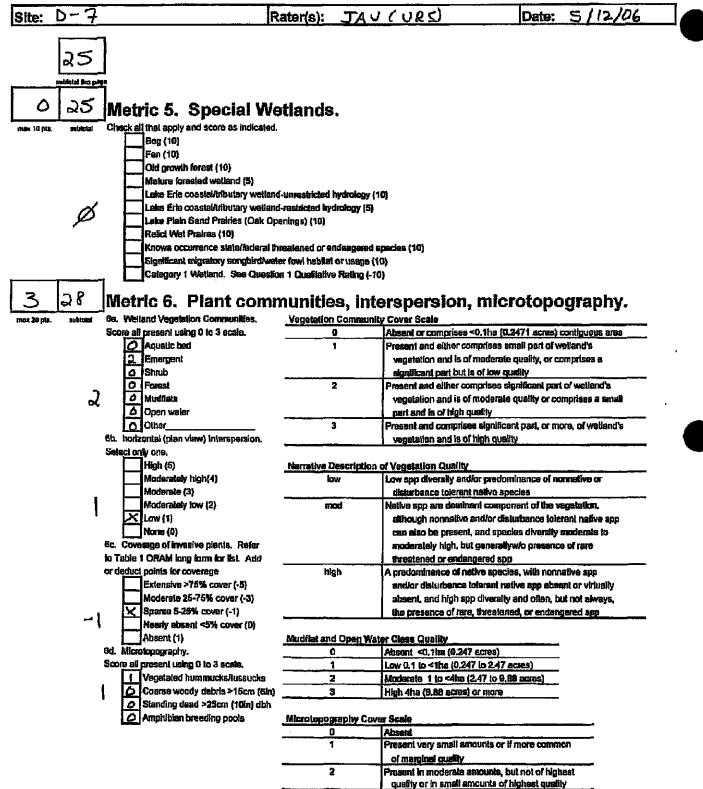
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**ORAM v. 5.0 Field Form Quantitative Rating** 



# ସଟ GRAND TOTAL (max 100 pts)

Refer to the most recent ORAS Boore Calibration Report for the acading breakpoints between webland antegories of the following address: http://www.eps.xtais.aiv.us/dow/40/1.break

3

Present in moderate or greater emounts

and of highest quality

# ChicEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3): 55

Care I

SITE NAMELOCATION AMP - Ohio	
SITE NUMBER BM - SIB B RIVER BASIN DRAINAGE AREA (m#)	
LENGTH OF STREAM REACH (ft) LAT LONG RIVER CODE RIVER MILE	_
DATE 5/13/06 SCORER JN/JAV COMMENTS	<u> </u>
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructio	1945
STREAM CHANNEL SINONE / NATURAL CHANNEL CORECOVERED CORECOVERING CORECOVER NO RECOVER	i <b>Y</b>
MODIFICATIONS:	
TYPE         PERCENT         TYPE         PERCENT         Multiple         Multi	iHEI etric pints
	IX = 40
30 % GRAVEL (2-84 mm) [9 pts] 0 0 0 MUCK [0 pts]	5
D SAVD (<2 mm) [e pe] D D ARTIPICIAL [a pre] }	
	÷₿
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:	•
evaluation. Avoid plunge pools from road culverts or storm water pipes)       (Check OWLY one box):         > 30 cantimeters [20 pts]       > 5 cm - 10 cm [15 pts]         > 22.5 - 30 cm [30 pts]       < 5 cm [5 pts]	Depth ax = 30
COMMENTSMAXIMUM POOL DEPTH (centimeters):	
3.       BANK FULL WDTH (Measured as the average of 3-4 measurements)       (Gheck ONLY one box):       Ba         > 4.0 meters (> 13) [30 pts)       S       > 1.0 m - 1.5 m (> 3' 3" - 4" 6") [16 pts]       W         > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]       S       s t.0 m (< 3' 5") [5 pts]	inkfull //dth axe30
COMMENTSAVERAGE BANKFULL WIDTH (meters)	
This information <u>must</u> also be completed           RIPARIAN ZONE AND FLOODPLAIN QUALITY         ANOTE: River Left (L) and Right (R) as looking downstream from the second	
L,R (Per Bank) L, R (Most Predominent per Bank) L, R SS ST Wide >10m SSSS Mature Forest, Weijiand CI Conservation Tillage	
Moderate 5-10m     Street Immalure Forest, Shrub or Old     D     Urban or industrial     Field	
CI CI Nerrow Som	
Image: State of the state o	
FI.OW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing I Moist Channel, isolated pools, no flow (intermittent) Subsurface flow with isolated pools (interstitial) I bry channel, no water (Ephemoral) COMMENTS	
SINUOSITY (Number of bands per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 43 2.0 3.0 0.5 1.5 2.5 33	
STREAM GRADIENT ESTIMATE Figure (0.5 Moderate)  Figure (0.5 Moderate) Figure (0.5 Moder	

October 24, 2002 Revision

# BM-SIBB

· · · · · · · · · · · · · · · · · · ·	(If Yes, Attach Completed CHE) Form)
DOWNSTREAM DESIGNATED USE(S)	
	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
🗇 EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: New Hoven, UV-OH	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Meigs To	
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of lest precipitation:	Unknown ausnitiv: unknown
Photograph Information:	
Elevated Turbisity? (Y/N): Canopy (% open):}	5-20%
Nete samples collected for water chamistry? (YIN): <u>N</u> (Note	lab sample no. or id, and allach results) Lab Number
Field Measures: Temp (*C) Dissolved Oxygen (mg/i)	pH (S.U.) Conductivity (µmhos/cm)
	ioi, please axplein:
- III COMPUTE ISSUE ISSUE SCHERAR ALLIER BROUDI (1114)	ol, pease exprem:
	₩₩₩
Addilional commants/description of pollution impacts:	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION Performed? (Y/N); (If Yes, Record all observations. Vouc ID number. Include appropriate field of fish Observed? (Y/N) N Voucher? (Y/N) Salamanders	cher collections optional. NOTE: sil voucher samples must be labeled with the site dels sheats (rom the Primary Haadwater Habitat Assessment Menual) a Observed? (Y/N) Voucher? (Y/N) usilic Macroinverlebrates Observed? (Y/N) Voucher? (Y/N)
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BIOTIC EVALUATION Performed? (Y/N):	cher collections optional. NOTE: sil voucher samples must be labeled with the site dels sheets from the Primary Headwater Habitat Assessment Menual) a Observed? (Y/N) Voucher? (Y/N) usite Macreinvertebrates Observed? (Y/N) Voucher? (Y/N) DN OF STREAM REACH (This must be completed): for site evaluation and a narretive description of the stremn's location
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October 24, 2002 Revision

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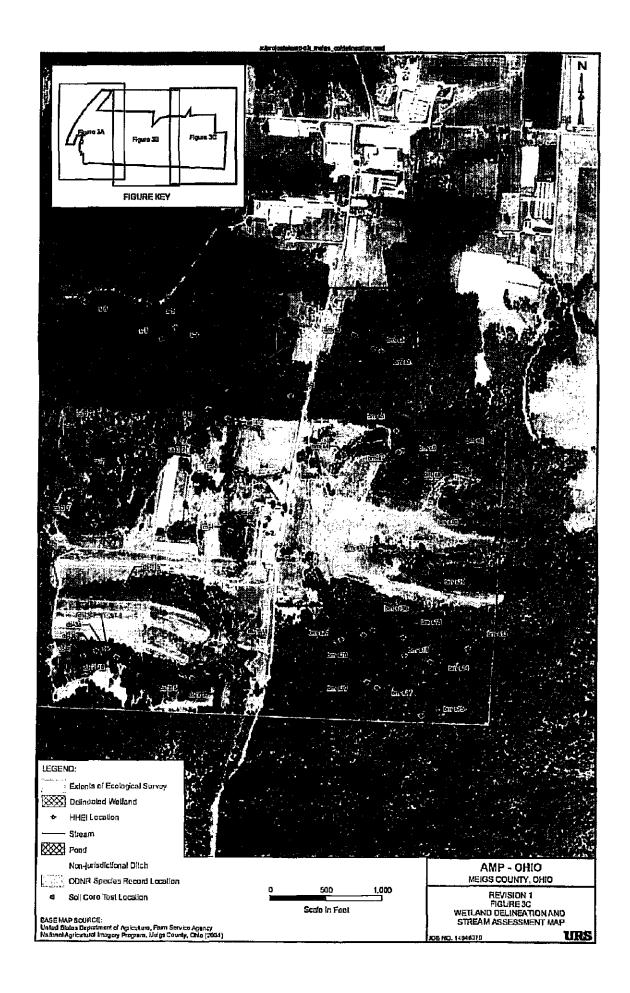


Photograph 1: View of Stream bm-s13b, looking east-southeast.



Photograph 2: View of Wetland d-7, looking north-northwest.





APPENDIX 07-3

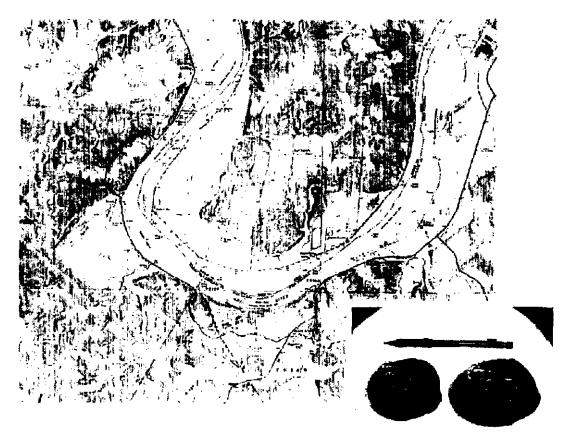
# MUSSEL SURVEY

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# Freshwater Mussel Survey of the Ohio River at AMP-Ohio's Proposed Generating Facility (Ohio River Mile 236-237)

FINAL



Prepared for: URS 36 East Seventh Street, Suite 2300 Cincinnati, OH 45202

**Prepared by:** EA Engineering, Science, and Technology 15 Loveton Circle Sparks, MD 21152

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December 26, 2006

#### 1.0 INTRODUCTION

AMP-Ohio is applying for a Section 10 permit under the Rivers and Harbors Act of 1899 for construction of a proposed generating facility in Meigs County, OH. An assessment of the existing biological conditions in the project area is required as part of the permit application, prior to construction or dredging activities. As part of evaluating the proposed instream construction activities, the U.S. Fish and Wildlife Service (FWS) determined that a qualitative survey of the freshwater mussel fauna in the vicinity of the proposed construction sites was necessary to ensure that activities would pose no harm to federally listed mussel species. Several federally endangered mussel species have been reported by FWS as present in Meigs County Ohio and Mason County West Virginia, where both counties border the project site (FWS 2006, FWS 2002):

#### <u>Meigs Co., OH</u> *Cyprogenia stegari*a (fanshell)

Lampsilis abrupta (pink mucket) Plethobasus cyphus (sheepnose) Mason Co., WV Lempsilis abrupta (pink mucket)

In this reach of the Ohio River, the state of West Virginia has jurisdiction over the natural resources of the river, and tables included in the results section of this report reflect that jurisdiction. This mussel survey was designed to define the presence and abundance of freshwater mussel species within the vicinity of the proposed project site upstream of the Racine Lock and Dam (ORM 236-237).

A study plan was developed and provided to US Fish and Wildlife Service (FWS) and West Virginia Department of Natural Resources (WV DNR) for review and comment. Ms. Janet Clayton (WV DNR), Ms. Barbara Douglas (FWS), and Ms. Patricia Morrison (FWS) provided comment via email or phone calls. Ms. Clayton included the following changes to the study plan: (1) a qualified malacologist should be present, (2) update the definition of fresh dead shells to include those that have shiny nacre and intact hinge, (3) redefine mussel concentration to include 0.5 mussels/m<sup>2</sup>, (4) note that the time limitation for conducting surveys is from May to October, and (5) include minimum visibility requirements (at depth) to be  $\geq$  20 inches. Ms. Morrison sent minor suggestions, which included similar comments to Ms. Clayton's. However she added that while the ORVEMS (2004) protocol suggests using 100 m long transects, this survey may need to include longer transect lines as needed to account for project-related activities beyond the standard 100 meters. Ms. Douglas had no additional comments beyond what WV DNR and FWS had already provided.

A final study plan was sent to Ms. Clayton in September 2006 along with a scientific collecting permit application. The collection permit was issued to Mr. Alan Christian (Arkansas State University) who accompanied EA during the survey. All comments and changes to the draft study play were included in the final study plan (Appendix A).

1

#### 2.0 METHODS

#### 2.1 Mussel Survey

During October 11-12, 2006, the area proposed for use by AMP-Ohio was surveyed for unionid mussels in the mainstem Ohio River. Riverine conditions during the survey were typical for flow conditions (22,000 cfs) and gauge heights (25 ft) during the month of October (USGS 2005). The station is located on the Ohio bank between Ohio River Mile (ORM) 236-237, just upstream of the US Army Corps of Engineer's Racine Lock and Dam (Figure 2-1).

A qualitative survey was conducted to establish baseline conditions and determine the presence of live mussels in the project area. Mainstream Commercial Divers, Inc. (MCDI) provided a professional dive crew that was certified to meet OSHA requirements. The divers used surface supplied diving equipment with voice communications to conduct this survey. Dr. Alan Christian of Arkansas State University was retained by EA to provide additional taxonomic expertise while onsite. Prior to conducting field activities, Dr. Christian obtained scientific collecting permits from the state of West Virginia. Substrate characterization and water quality measurements were also conducted throughout the project reach.

This qualitative survey was designed to meet the following conditions:

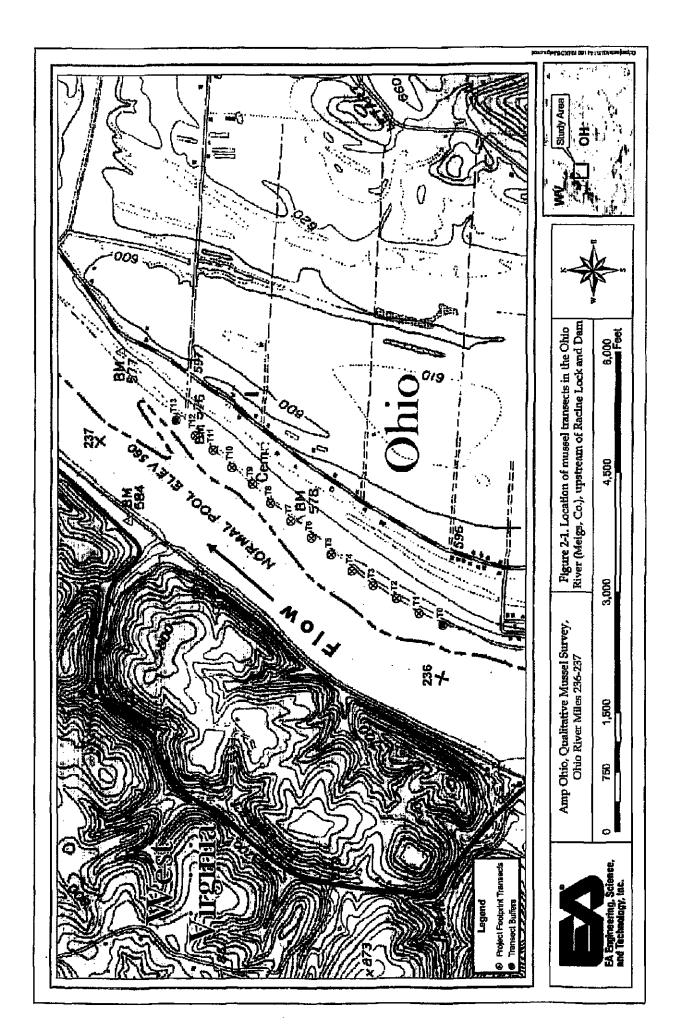
- collect and identify live mussels adjacent to the proposed generating facility,
- collect and identify fresh dead<sup>1</sup> mussels located at the proposed generating facility,
- estimate the abundance and density of live species collected from the survey site, and
- compartmentalize live/fresh dead individuals using external annuli into two age groups:
   <3 years of age and >3 years of age.

#### Qualitative Sampling of Mussels

The shoreline footprint of the proposed power station is approximately 1,200 m (3,936 ft) in length. Activities within the project footprint include the construction of an offshore intake structure (~40 m in length from the shoreline) located near the center of the project, and numerous mooring cells located near the most upstream reach of the project. Because these project-related activities were less than 100 m from the shoreline, transects used in this study were not extended beyond the standard 100 m length. Mussel concentrations (i.e. defined as 0.5 animals per square meter; see Appendix A Study Plan) at this project were not high enough to require extended (3-4 additional transects) upstream and downstream buffer zones, however, we did include one additional transect at the upstream and downstream ends of the project boundary.

All methods were conducted using the Ohio River Valley Ecosystem Mollusk Subgroup (ORVEMS) protocol for sampling mussels in the Ohio River (ORVEMS 2004). A series of transects were established throughout the project area to survey for live mussels (Figure 2-1). A total of 14 transects were surveyed for the project (Table 2-1). The first transect (T1) was located at the upstream project boundary and all subsequent transects (T2-T12) were positioned downstream of the first transect, 100 m apart. Two additional transects (T0 and T13) were included as buffers for the upstream and downstream boundaries, both positioned 100 m apart

Fresh dead shells in this study will be defined as any shell that has shiny nacre and intact hinge.



from the existing survey transects. Each transect was established perpendicular to flow and marked at every 10 m segment. For each 100 m transect length, there were ten, 10-m segments along each transect. Each 10-m segment was sampled individually by the divers, and any mussels collected in that segment were maintained as a separate replicate. Some excavation (~10 cm) and disturbance of the surface sediments occurred during the survey to collect mussels for species identification.

	AMP-Ohio Station (~1,200 m shoreline)
	Project area = 12 transects (T1-12)
1	Upstream Buffer = 1 transect (T0)
	Downstream Buffer= 1 transect (T13)
	TOTAL = 14 transects

Table 2-1. Transect numbers for mussel surveys at AMP-Ohio Project (ORM 236-237).

All live individuals were identified to species, and while the study plan suggested that each individual be grouped into two age classes (those that were <3 years of age and those that were >3 years of age) all six live mussels were specifically aged using external annuli. During the identification process, mussels were held outside of water less than five minutes then returned to the Ohio River at the same location. The taxonomic key, *Freshwater Mussels of the Midwest*, was used for all species identifications (Cummings and Mayer 1992).

#### 2.2 Water Quality and Substrate Composition

Water quality was measured several times a day, typically once in the morning, midday, and late afternoon. Measurements were taken in the river channel at the surface, middle, and at depth. Water quality measurements included temperature, pH, dissolved oxygen, conductivity, and secchi depth. Visibility at depth was also noted during the survey with diver communication.

Substrate composition was visually estimated to determine the range of particle sizes within the survey areas. The Wentworth (1922) scale was used to characterize substrate at all transect segments.

Additional data collected at the survey area included weather conditions and GPS locations of each transect line used for surveying.

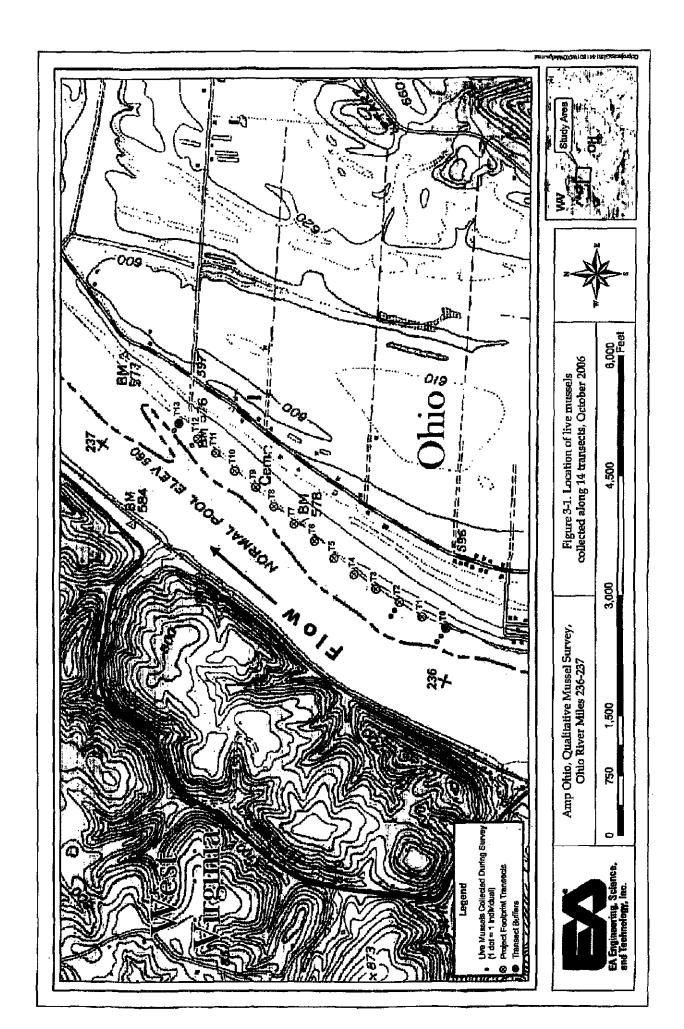
#### 3.0 RESULTS

#### 3.1 Station Transects and Survey Conditions

All transects at each station were located using GPS and latitude/longitude coordinates. A photo log of the survey is provided in Appendix B. Weather during the survey ranged from rain showers to sunny conditions, and daytime air temperatures ranged from 55 to 65°F.

#### 3.2 Freshwater Mussel Results

A total of six live individuals comprising five species were collected during the October survey (Table 3-1; Figure 3-1). Relic shell material was not found in the project area. Species density of live mussels did not exceed 0.1/m<sup>2</sup> throughout the 1,400 meters surveyed, and therefore did not



qualify as a mussel concentration (e.g. 0.5 mussels/m<sup>2</sup>). Two Amblema plicata were collected from the upstream buffer transect (T0) at 20-40 meters from the shoreline. Lampsilis siliquoidea and Lasmigona complanata were both collected at Transect 2 at 0-10 meters and 20-30 meters, respectively. Two species were collected at the downstream end of the project footprint, one *Potamilus alatus* was collected at Transect 12 at 10-20 meters, and one *Obliquaria reflexa* was collected at Transect 13 at 20-30 meters from shoreline. There were no other live mussels collected between Transect 2 and Transect 12 (nearly 1,000 meters).

Species	Common Name	Quantity	Transects Collected	WV Status*
Ambiema plicata	threerldge	2	T0 (upstream buffer)	common
Lampsilis siliquoidea	fat mucket	1	T2	common
Lasmigona complanata	white heelsplitter	1	T2	S2/G5*
Obliquaria reflexa	threehorn wartyback	1	T13 (downstream buffer)	S2/G5*
Potamilus alatus	pink heelpslitter	1	T12	common
	Total Abundance	6		
	Total Species	5		

# Table 3-1. Composition, abundance, and status of mussel species collected during a qualitative survey at ORM 236-237, October 2006

\*Category S2/G5: indicates a species that is considered "very rare and imperiled" (S2)/ and considered very common and demonstrably secure" (G5) (West Virginia DNR 2006).

#### Mussel Survey Summary

No federally listed threatened or endangered species were collected during the survey within the 1,200 m project footprint or the additional 200 meters of upstream and downstream buffer transects (USFWS 2004). No mussel concentrations [as defined by ORVEMS (2004) as 0.5 mussels/m<sup>2</sup>] were identified during the survey and therefore did not require additional transects. A total of six live mussels was collected during the survey comprising five species. Four of these species are considered common by the state of West Virginia. Two species, Obliquaria reflexa and Lasmigona complanata, collected during the survey are considered rare by the West Virginia Natural Heritage (WVNH). While West Virginia does not have state threatened or endangered legislation, it assigns all rare species a ranking that is defined by WVNH. Both species are categorized as S2 by the state of West Virginia, which is considered "very rare and imperiled". However, on a global ranking, both species are categorized as G5, which is considered "very common and demonstrably secure, though rare in parts of its range". Obliguaria reflexa and L. complanata have been reported throughout the Ohio River, and a 10-year monitoring effort conducted just 30 river miles upstream of the proposed AMP-Ohio site indicates that both species were collected annually from 1993-2004 (EA 2005). While total abundance for L. complanata was somewhat low (n= 290) during the 10-year monitoring program, O, reflexe had the second highest abundance (N>5,700) of all species collected at this site, second only to Amblema plicata.

In the present survey, no single species dominated the small collection, and all but one species, *A. plicata*, had only one individual collected. No relic shells or fresh dead shells were collected during the survey either. Few exotic species were identified, two Asian clams (*Corbicula fluminea*) were collected at Transect 1 and no zebra mussels (*Dreissena polymorpha*) were collected throughout the survey footprint. Age estimates of live specimens were all greater than three years of age and ranged from 5-12 years. Shell quality for all species was considered good with very little erosion of the periostracum layer. All raw data, including shell age, substrate composition, water depths are provided in Appendix C.

#### 3.3 Water Quality and Substrate Composition

Water quality was measured twice daily at randomly selected transects to determine whether conditions were suitable for accurate survey assessments (i.e. increased turbidity can inhibit underwater line of sight). Water quality conditions during the survey did not change substantively during the survey (Table 3-2). Secchi depth measurements ranged from 61 to 70 cm and water temperatures ranged from 18.2 to 19.5°C (surface to depth) during the survey. Audio communications with the diver during the survey indicated that the diver could see approximately 22 inches ("arms length") with the assistance of underwater lights.

Transect	Date _	Time	Level	Temp (C)	Secchi (cm)	DO (mg/L)	Cond. (uS/cm)	pH_
T2	10-11-06	1035-1100	Surface	18.7		7.09	337	5.67
			Middle	18.7	62.5	7.02	336	6.24
			Depth (28')	18.7		7.00	336	6.67
T5	10-11-06	1239-1306	Surface	19.5		7.19	327	*
			Middle	18.9	68.0	7.20	336	*
			Depth (29')	18.7		7.24	339	*
T9	10-11-06	1532-1558	Surface	18.3		7.67	341	*
			Middle	18.3	69.5	7.48	343	*
			Depth (35')	18.4		7.28	342	*
T10	10-12-06	0930-0952	Surface	18.3		7.57	329	6.19
			Middle	18.3	64.5	7.30	329	6.42
			Depth (35')	18.3		7.18	330	6.58
TO	10-12-06	1226-1248	Surface	18.2		7.15	329	6.85
			Middle	18.3	60.5	7.00	329	7.03
			Depth (28')	18.3		<u>6</u> .97	329	7.13
			Average	18.5	65.0	7.22	334	6.53

Table 3-2. Water quality measurements for AMP-Ohio Station October 11-12, 2006

\*pH probe malfunctioned, no data collected at these transects.

Average substrate composition at each of the transects is presented in Table 3-3. While substrate was visually estimated at each 10-m segment, all segments within each transects were averaged together for a single value. Substrate at all transects varied slightly, but consisted primarily of mud/clay (41%) and sand (51%), with smaller percentages of silt, gravel, and cobble at some transects. Mussels collected during this survey generally prefer substrates with a mud/sand/gravel mixture (Cummings and Mayer 1992), however, the few individuals collected indicate that while substrate may be suitable, other factors are contributing to the low abundances in this reach of the Ohio River.



## 4.0 Recommendations

We consider this qualitative survey sufficient to provide the data needed to establish baseline conditions for the Ohio River near AMP-Ohio's proposed generating facility at ORM 236-237. The very low abundance (n=6) of freshwater mussels within the project footprint as well as the lack of mussel concentrations calculated at the site support going forward with the proposed in-stream construction activities. Additionally, the lack of federally listed species in the project area offers additional evidence that these areas are likely void of such species.

Transect	Clay/Mud (%)	Silt (%)	Sand (%)	Gravel/ Pebble (%)	Cobble (%)
TO (US buffer)	30	8	54	0	8
T1	36	0	64	0	0
T2	40	0	60	0	0
Т3	60	0	40	0	0
T4	60	0	40	0	0
Т5	50	D	50	0	0
T6	65	0	35	0	0
<b>T</b> 7	44	0	56	0	0
T8	42	0	53	0	5
Т9	42	0	56	0	2
T10	29	0	51	10	10
T11	29	4	44	17	6
T12	21	B	55	4	12
T13 (DS buffer)	26	6	53	8	8
Average	41	2	51	3	4

# Table 3-3. Average percent composition of surficial sediments collected from AMP-Ohio Station (ORM 236-237), October 2006

Clay/Mud; <0.004 mm; Silt: 0.004 - 0.06 mm; Sand: 0.06 - 2 mm; Grave//Pebble: 2 - 64 mm; Cobble: 64 - 256 mm (Wentworth 1922)

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#### 5.0 Literature Cited

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Mussel Study Plan: AMP-Ohlo Qualitative Mussel Survey (ORM 236-237)

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## **FINAL STUDY PLAN**

# Qualitative Mussel Survey at AMP Ohio's Proposed Generating Facility (Ohio River Mile 236-237)

Prepared for:

URS 36 East Seventh Street, Suite 2300 Cincinnati, OH 45202

Prepared by:

EA Engineering, Science, & Technology, Inc. 15 Loveton Circle Sparks, MD 21152



### INTRODUCTION AND PURPOSE

At the request of URS and AMP Ohio, EA Engineering, Science & Technology, Inc. (EA) has developed a study plan to conduct a qualitative freshwater mussel survey in the Ohio River mainstem near Letart, WV. AMP Ohio is applying for a Section 10 permit under the Rivers and Harbors Act of 1899 for a proposed generating facility in Meigs County, OH. An assessment of the existing biological conditions in the project area is required as part of the permit application, prior to construction or dredging activities. EA will conduct a freshwater mussel survey at the proposed generating facility to determine the presence and abundance of live native mussels.

This qualitative survey is designed to meet the following conditions:

- collect and identify live mussels adjacent to the generating facility.
- collect and identify fresh dead<sup>1</sup> mussels located at the generating facility.
- estimate the abundance and density of live species collected from the survey site, and
- compartmentalize live/fresh dead individuals using external annuli into two age groups: <3 years
  of age and >3 years of age.

US Fish and Wildlife Service (FWS) is increasingly concerned with the potential collection of threatened or endangered (T&E) species in this reach of the Ohio River. While we do not expect to collect any federal or state listed species, we will take necessary precautions to limit their exposure out of water if any are collected during the survey. A list of all state- and federally-listed species is provided in Table 1, and three of the species are known to occur in Meigs County, OH. Additional data will be collected for state or federal T&E species including shell length, specific age of individual, shell condition, and photographic documentation of representative species.

Other tasks that will be completed during the survey include substrate characterization and water quality. No voucher specimens of any live unionids will be preserved for this project.

### **DESCRIPTION OF WORK**

#### Field Design and Mussel Collection

All methods in a finalized project study plan will be approved by ODNR and FWS biologist prior to any fieldwork.

One station will be surveyed (in the vicinity of ORM 236-237) in the mainstem Ohlo River (Meigs County) in the summer of 2006 during low-flow conditions. Ohio guidance suggests that mussel surveys be conducted between May and October, and we plan to meet these conditions. The station is located on the Ohio bank near Letart, WV.

There is little existing information about mussel populations in the vicinity of this proposed station, therefore a qualitative survey will be conducted to establish baseline conditions and determine the presence of live unionids in the project area. Mainstream Commercial Divers, Inc. (MCDI) has been retained by EA to conduct the diving effort. Additional tasks will also be conducted during the survey,



Scientific Name	Common Name	Status
Cyprogenia stegaria	fanshell*	FE
Ellipsaria líneolata	butterfly	SE
Elliptio crassidens	elephant ear	SE
Epioblasma obliquata obliquata	purple catspaw	FE
Epioblasma obliquata perobliqua	white catspaw	FE
Epioblasma torulose rangiana	Northern riffleshell	FΕ
Epioblasma triquetra	snuffbox	SE
Fusconaia ebena	ebonyshell	SE
Fusconaia maculate	long-solid	SE
Lampsilis ovata	sharp-ridged pocketbook	SE
Lampsilis teres	yellow sands <b>heli</b>	SE
Lampsils orbiculata	pink mucket*	FE
Ligumia nasuta	Eastern pondmussel	\$E
Ligumia recte	black sandshell	ST
Meglonaias nervosa	washboard	SE
Obliquaria reflexa	threehorn wartyback	ST
Plethobasus cyphyus	sheepnose*	SE, FC
Pleurobema clava	clubshell	FE
Pleuroberna cordatum	Ohio pigtoe	SE
Pleurobema rubrum	pyramid pigtoe	SE
Quadrula cylindrical	rabbitsfoot	SE
Quadrula metanevra	monkeyface	SE
Quadrula nodulata	wartyback	SE
Toxolasma Ilvidus	purple lilliput	SE
Truncilla donaciformis	fawns foot	ST
Uniomerus tetralasmus	pondhom	ST
Villosa fabalis	rayed bean	SE, FC
Villosa lienosa	little spectacle case	SE

Table 1. List of state and federal threatened or endangered mussel species throughout the state of Ohio.

\* Species known to occur in Meigs County, OH, FE: federally endangered FC: federal candidate species SE: state (OH) endangered ST: state (OH) threatened

'Fresh dead shells in this study will be defined as any shell that has shiny nacre and intact hinge.

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which include substrate characterization and water quality measurements. Only voucher specimens of *relic shells* will be collected for verification of species identification.

#### Qualitative Sampling

One station will be surveyed for the presence of live unionid mussels, since the presence of dead shells at the site is often from upstream sources and have no relevance on the existing project. The survey area is approximately 0.7 river miles in length (1,097 meters of shoreline).

A series of transects (12-14 transects) will be established throughout the project area at each station to survey for freshwater mussels (Table 2). Each transect will be established 100 m apart, located perpendicular to flow along the bank, and marked at 10 m segments. While the Ohio River guidance document (ORVEMS 2004<sup>2</sup>) suggests that transects be spaced 100 m apart and 100 m in length throughout the project footprint (including buffer zones), we will interpret this guidance as required to ensure the health and safety of the divers. Our goal is to meet the specifications outlined in the guidance; however unexpected conditions (e.g. barge traffic, water depths greater than 45', instream hazards, etc.) may require us to modify these for diver safety.

If mussel concentrations in the project area exceed 0.5 animals per square meter (or 5 animals collected from any 10 m segment), which is considered by the state of Ohio as a "mussel bed", we will extend the downstream survey to include a buffer zone at each station that will consist of three additional transects. Additional transects are proposed downstream because the majority of potential effects would be seen downstream of the project area. If we do not identify mussel concentrations in the project vicinity, we will include only one transect upstream and downstream of the station and survey for live mussels.

No mussel concentrations*	Mussel concentrations identified**
Upstream = 1 transect	Upstream = 1 transect
Project area = 10 transects	Project area = 10 transects
Downstream = 1 transect	Downstream = 3 transects
TOTAL = 12 transects	TOTAL = 14 transects

#### Table 2. Transect scenarios for mussel surveys at one Ohio River station (ORM 236-237).

\*Number of transects if no mussel concentrations are identified in the project area.

\*\*Number of transects if mussel concentrations (>1/m<sup>2</sup>) are identified in the project area.

Qualitative sampling will be conducted at each 10 m segment and targeted transect lengths will be 100 m from the shoreline. After review of the proposed project construction, the footprint of construction activities (e.g. intake structure, mooring cells, discharge pipe) do not exceed the 100 m distance into the channel and therefore, no additional areas beyond this distance will need to be surveyed. Live mussels collected during the qualitative sampling will be identified to species and counted for abundance and relative density. Dr. Alan Christian of Arkanses State University has been retained by EA to oversee all mussel taxonomy and we will be utilizing his WV collecting permit for this project. All live and fresh dead



individuals will be grouped into two age classes using external annuli: those that are <3 years of age and those that are >3 years of age. EA is aware of the debate surrounding the accuracy of aging specimens from external growth rings or annuli and will use this method only as an estimate of age. During the identification process, mussels will be held in floatable fish baskets and left in the river water; some containers may be supplemented with battery-powered aerators to assure that dissolved oxygen doesn't decline below acceptable limits (<4 mg/L). All live specimens will be returned immediately following identification and aging. Relic shell material (of non-listed species) will be collected for species validation and taxonomic keys of the Ohio River (Cummings and Mayer 1992)<sup>3</sup> will be used for all species identification. Any federal or state listed mussel collected during the survey will undergo additional measurements including shell length measurements, shell condition, specific age determinations, and photographic documentation.

#### Water Quality

Water quality measurements will be conducted at each station. Water quality will include measurements of temperature, pH, dissolved oxygen, conductivity, and secchi depth. Mussel surveys will be conducted under water guality conditions that meet the minimum visibility of 20 inches at depth. All water guality data, including the required minimum visibility measurements will be provided in the final report.

Additional data will be collected at each station including weather conditions and GPS locations of each transect line used for surveying.

#### Substrate Characterization

Substrate composition will be visually estimated to determine the range of particle sizes within the survey areas. The Wentworth (1922)<sup>4</sup> scale, which has been approved by the state of Ohio as the most appropriate method, will be used to characterize substrate at the survey site.

### SUMMARY REPORT AND DELIVERABLES

Within 10 days of the survey completion, EA will provide URS with a list of species collected during the survey and their state and federal status.

EA will prepare a draft written report within 30 days of the survey completion that summarizes the study's methodology, technical findings (mussel species and abundance, water quality, and substrate characterization), and recommendations from the mussel survey. No statistical analyses will be required for this program because it is a baseline existing conditions survey. All comments from the draft report by URS, AMP Ohio, and other agencies will be addressed and a final report will be completed. Detailed appendices will be prepared that document the results of the field survey including mussel species and abundance, field data sheets, substrate, water quality, and photo log.

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<sup>&</sup>lt;sup>2</sup> Ohio River Valley Ecosystem Moltusk Subgroup (ORVEMS), 2004. Draft Protocol for Mussel Surveys in the Ohio River where Dredging/Disposal/Development Activity is Proposed.

<sup>&</sup>lt;sup>3</sup> Cummings KS and Mayer CA. 1992. Field guide to freshwater mussels of the Midwest. Illinois Natural History Survey Manual 5. 194 pp. \*Wentworth, CK. 1922. A scale of grade and class terms for clastic sediments. J Geol 30:377-392.

A table summarizing the mussel species identified during the survey and their abundances will be sent to Ohio DNR and West Virginia DNR by the end of the calendar year (Dec. 31, 2006) in compliance with the requirements for state collecting permits.

Appendix B

Photolog – AMP-Ohio Mussel Survey (ORM 236-237)

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# Photographic Record

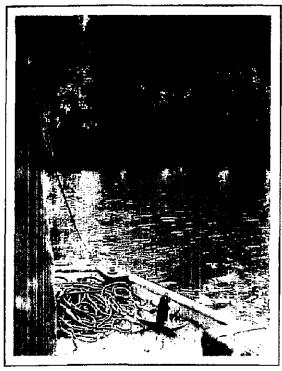
Amp Ohio Proposed Generating Station (ORM 236-237) Letart Falls, OH (Meigs County) October 11-12, 2006



Preparing diver



Diver surveying shallow depths near shoreline. Nuisance aquatic plants located along OH bank.



Laying weighted transect lines for survey. Orange buoy located on shoreline.



Audio communications with diver

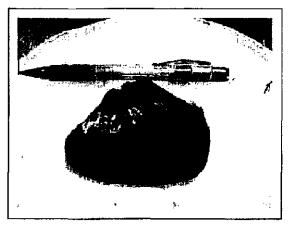


# Photographic Record

Amp Ohio Proposed Generating Station (ORM 236-237) Letart Falls, OH (Meigs County) October 11-12, 2006



Diver surveying near shoreline. Orange buoy used to mark the weighted transect line.



Pink heelsplitter (*Potamilus alatus*) collected at Transect 12,



Diver preparing for a dive. Mesh bags were used to hold mussels collected at each 10 m segment.

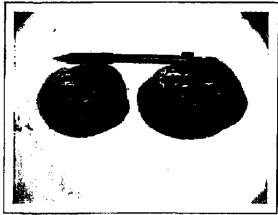


Threehorn wartyback (Obliquaria reflexa) collected at Transect 13.



# **Photographic Record**

Amp Ohio Proposed Generating Station (ORM 236-237) Letart Falls, OH (Meigs County) October 11-12, 2006



Threeridge (Amblema plicata) collected at the upstream buffer transect (T0).



Diver preparing to survey a transect near the shoreline.



Ohio River looking downstream toward Racine Lock and Dam.



Dive tender holding umbilical line to diver.

Appendix C

Raw Data – AMP-Ohio Mussel Survey (ORM 236-237)

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Appendix C - Raw Data of Meigs Co. (OH) Mussel Survey (ORM 236-237)

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	Comments																																					
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Water	Depth (ft)	24	25	26	28		7	17	20	23	25	25	27	28	20		9	<b>8</b>	23	24	26	27	28	29	29		1	16	ស	25	27	23	30	31	31		10	22
	Cobble	0	0	0	0	¢	Q	0	Ð	0	0	0	o	0	0	D	0	0	0	0	0	0	0	0	0	0	o	0	0	0	0	0	Q	0	0	0	0	0
Gravel/	Pebbie	0	0	0	0	0	0	0	0	0	0	0	0	D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sand	<u>10</u>	100	100	100	0	Ð	0	0	0	0	100	<u>9</u>	100	100	100	0	0	0	0	0	100	100	100	100	30	0	0	0	0	0	0	5 8	<del>1</del> 00	10 0	0	a	0
	Sift	0	0	0	0	0	0	0	0	0	0	0	¢	0	0	0	0	0	0	0	0	0	o	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Age (yr) Clay/Mud	.0	0	0	0	100	100	100	100	100	100	0	0	0	0	0	100	100	10	100	100	0	o	0	0	50	100	100	100	100	100	100	o	O	0	100	100	100
	Mussels	none	none	none	none	nane	none	none	none	попе	none	nonê	none	onor	none	none	none	anon	none	none	auou	none	none	enone	none	anon												
	Date	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006
Transect	Segment	0/	80	06	100	10	20	30	40	<u>9</u> 0	60	20	80	06	100	10	20	30	40	50	8	70	8	6	100	10	20	8	40	20	60	70	80	06	100	10	20	30
-	Transect	<b>T</b> 3		,		T4										T5										T6										11		

Appendix C - Raw Data of Meigs Co. (OH) Mussel Survey (ORM 236-237)

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Appendix C - Raw Data of Meigs Co. (OH) Mussel Survey (ORM 236-237)

	Comments																																					
Water	Depth (ft)	23	27	29	80	31	32	33	£	21	28	30	31	32	33	33	¥	¥	Ø	23	27	32	33	33	33	¥	34	35	17	27	32	33	34	\$	\$	35	35	35
	Cobble	0	0	0	a	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	50	50	¢	0	0	0	¢	0	0
Gravel	Pebble	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	50	0	0	0	0	0	0	0
Ċ	Sand	8	8	00	00	10 10	100	<u>6</u>	0	0	0	8	8	02	8	8	<mark>6</mark>	100 100	0	0	0	8	8	8	8	8	8	8	0	0	٥	8	8	80	60	60	2	80
i	Ē	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	٥	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Age (yr) Clay/Mud	20	40	40	40	0	0	0	100	100	50	20	40	30	40	40	0	0	100	100	80	20	ନ୍ଦ	20	2	ୟ	8	20	100	0	0	20	50	2	40	40	8	20
Ma	Mussels	none	auou	none	none	none	anon	none	none	none	none	none	none	none	none	none	none	none	none	<b>9</b> 00	none	none	none	none	none	none	none	none	none	none	none	none						
	Uate	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006	10/11/2006
Transect	segment	\$	50	60	2	8	8	100	10	20	8	4	20	90	2	80	8	100	10	23	8	4	50	60	2	80	06	100	10	20	30	<del>4</del> 0	50	60	70	80	06	100
T	I ransect	1						-	18										19										T10									

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	I ransect									12121	
Transect	Segment	Date	Mussels	Age (yr) (	e (yr) Clay/Mud	Silt	Sand	Pebble	Cobble	Depth (ft)	Comments
T11	10	10/12/2006	none		100	0	0	a	0	12	
	20	10/12/2006	910U		0	Ð	٥	ß	50	24	
	30	10/12/2006	none		0	0	0	100	0	32	
	40	10/12/2006	none			•	large del	oris pile			
	20	10/12/2006	none		0		8	0	0	32	
	60	10/12/2006	none		40		8	0	0	R	
	70	10/12/2006	none		20		ଞ	0	0	34	
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Appendix C - Raw Data of Meigs Co. (OH) Mussel Survey (ORM 236-237)



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APPENDIX 07-4

## ARCHAEOLOGY REPORT

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## REPORT FOR PHASE I ARCHAEOLOGY SURVEY PROPOSED BASELOAD GENERATING FACILITY, LETART TOWNSHIP, MEIGS COUNTY, OHIO

Submitted to:

URS Corporation 36 East 7th Street, Suite 2300 Cincinnati, Ohio 45202

Submitted by:

Natural & Ethical Environmental Solutions 8857 Cincinnati-Dayton Road, Suite 203 West Chester, Ohio 45069

PIIN MAMO

Jeannine Kreinbrink, MA, RPA Principal Investigator

September 11, 2006

## ABSTRACT

URS Corporation requested a Phase I cultural resources survey of an approximately 1,000 acre project area for a proposed Baseload Generating Facility, located in Letart Township, Meigs County, Ohio. The project area includes both upland terrain and terraces of the Ohio River. The project area lies in the Unglaciated Plateau of southern Ohio. The project area includes approximately 1,000 acres, of which approximately 495 acres constitutes the Upper Landfill Portion of the project area, and 505 acres the Lower Terrace Portion of the project area. This report includes the overall background sections such as Literature Review and Methods for the entire project. Also included in this report is the Results Section for the survey of the Lower Terrace Portion of the project. The archaeological survey of the Upper Landfill Portion of the project will be described in a separate Addendum report. The Area of Potential Effect (APE) for the archaeological study equals the 1,000 acre parcel that comprises the project area. Nonarchaeological impacts such as visual impact on surrounding properties will be defined and discussed in a separate Visual Impact/Historic Resources Report.

The project, a proposed baseload electric generating facility, requires review in accordance with regulations of the Ohio Power Siting Board (OPSB). The archaeological investigations are carried out in accordance with regulations put forth by the Ohio Historic Preservation Office and attendant regulations of Section 106 (National Historic Preservation Act, 1966, as amended).

The archaeological survey of the Lower Terrace Portion of the Project Area documented one previously recorded site (33MS288) and 69 previously undocumented sites (33MS474 through 33MS542). Phase II evaluation testing is recommended for site 33MS288 if it cannot be avoided.

Of the overall catalog of previously undocumented sites, 46 are isolated finds that are not considered eligible for the National Register and no further investigation is recommended for these 46 sites: 33MS475-476, 33MS478-481, 33MS483-485, 33MS487-491, 33MS493-508, 33MS510, 33MS513, 33MS515-519, 33MS523-526, 33MS532, 33MS534, and 33MS537-539.

Of the remaining 23 previously undocumented sites, Phase II evaluation testing is recommended for seven sites; 33MS474, 33MS477, 33MS486, 33MS531, 33MS540, 33MS541, and 33MS542.

No further investigation is recommended for sites 33MS482, 33MS492, 33MS509, 33MS511, 33MS512, 33MS514, 33MS520, 33MS521, 33MS522, 33MS527, 33MS528, 33MS529, 33MS530, 33MS533, 33MS535, and 33MS536.

With the exception of the eight sites (33MS288, 33MS474, 33MS477, 33MS486, 33MS531, 33MS540, 33MS541, and 33MS542) recommended for Phase II evaluation, no further investigation is recommended for the 505 acre Lower Terrace Project Area.

Meigs County 1,000 acres AMPOhio Baseload Generating Facility Phase I Archaeology Survey

The geomorphology of the Lower Terrace Project Area was evaluated through a record search, geotechnical drilling results, and comparison with archaeological results. Little potential for buried archaeological sites has been found based on the presence of Early Archaic period projectile points on the ground surface and the evaluation of the geomorphological setting. No systematic deep testing is recommended for the Lower Terrace Project Area.

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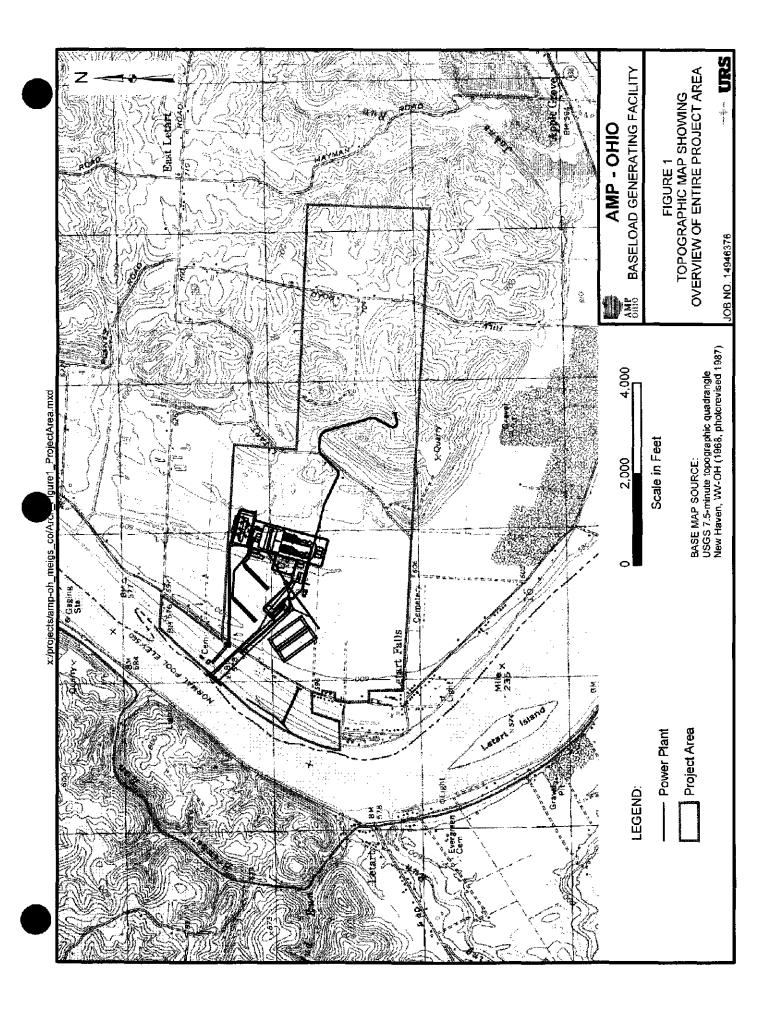


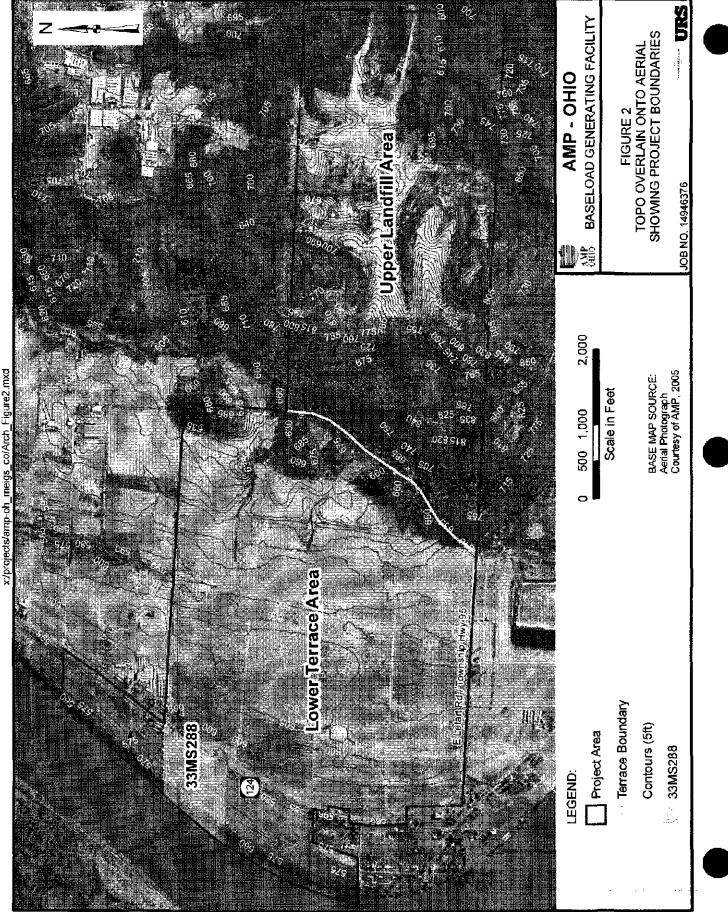
## INTRODUCTION

URS Corporation (URS) requested a Phase I archaeology survey of approximately 1,000 acres located in Letart Township, Meigs County, Ohio. The project area is situated in the Allegheny Plateau physiographic region and includes both upland and river terrace settings. The Lower Terrace project area consists of approximately 505 acres. The Upper Landfill Area includes 495 acres and will be discussed in an Addendum Report. This volume describes the archaeological survey of the Lower Terrace region that includes approximately 505 acres of agricultural, fallow, and wooded land. AMP Ohio requested the survey through URS in anticipation of coordination with the OPSB. The project is conducted in accordance with both federal (36CFR800, NHPA 1966, as amended) and Ohio Historic Preservation Office (OHPO 1994, as amended) regulations regarding the conduct of cultural resources investigations.

Ms. Jeannine Kreinbrink, of Natural & Ethical Environmental Solutions, serves as Principal Investigator and Field Director for the project. Fieldwork took place between March and the end of June 2006. She was assisted by crew chiefs Mr. Doug Von Strohe and Mr. Jason Hutchinson. Field crew included Ms. Angie Paolucci, Mr. Shawn Fahrenbach, and Mr. Baird Ullrey. Ms. Kreinbrink conducted the literature review at the Ohio Historic Preservation Office in Columbus, Ohio over several occasions between December 2005 and January 2006. Fieldwork methodology was worked out with the OHPO at a meeting on December 14, 2005.

The Lower Terrace project area consists of approximately 505 acres of agricultural, fallow, and wooded land located on a sweeping bend of the Ohio River. At this location, the Ohio River flows north along the western edge of the project area (Figures 1 and 2). The Lower Terrace project area has been divided into 14 survey sections for ease of discussion. The Upper Landfill project area will be described in a separate Addendum to this report.





co/Arch\_Figure2.mxd

## **RESEARCH DESIGN**

A Phase I survey is designed to assess the presence or absence of archaeological sites within a project area using sampling procedures approved by the Ohio Historic Preservation Office (OHPO) and federal guidelines. The sampling procedure includes such techniques as shovel testing, and surface reconnaissance when possible.

Much debate has taken place on the efficacy of shovel test sampling as a site discovery technique (for example, Shott 1989). However, others have illustrated that, although flawed as a sampling technique, shovel testing may be a useful tool when combined with other search methods (Nance and Ball 1989; Lightfoot 1989). Other search methods include examination of ground surface when possible, other subsurface examination techniques (auguring, backhoe testing for example), and using literature reviews to synthesize predictive models that deal with landform, relationship to water sources, slope, and other locational variables. While these methods do not provide 100 percent certainty in intersecting the boundaries of sites, they have been consistently successful in locating archaeological sites in both surface and subsurface contexts. Approaching a project with a clear understanding of the local physiography, cultural setting, and environmental factors such as soils, slope, and water resources, will greatly increase the results of field reconnaissance techniques.

For this project, knowledge of local cultural and environmental variables was synthesized to form a research design aimed at intersecting site boundaries. Techniques planned included a surface reconnaissance of the plowed fields in transects of 5 meters or less. The literature review included a search of references on previous archaeological work in Meigs County, and a review of state site files. Historical research included a review of local historic references and maps, the Ohio Historic Inventory and the National Register files. In addition, the scope of work was discussed with the OHPO in a meeting that took place in December 2005.

### **Physical Setting**

## Physiography-Geomorphology-Geology

Meigs County is situated in the unglaciated Allegheny Plateau in Ohio (USDA 1998). The bedrock dates to the Pennsylvanian Age and includes primarily sandstone, shale, coal, iron ore, and limestone. Coal, limestone, and gravel have historically been mined throughout the county.

The project area is situated on both riverine and upland settings along a sharp bend in the Ohio River (Figure 1). The Ohio River flows generally north along the western edge of the project area. Please see the Results Section for a more detailed discussion of the geomorphology of the project area.

Meigs County 1,000 acres AMPOhio Baseload Generating Facility Phase I Archaeology Survey

Soils

The soils in the project area form a complex arrangement that correspond to high and low areas on the terraces, older and more recent alluvium, and drainage. Soils found at the site can be divided into two areas. Soils that are found along the alluvial terrace of the site are predominately friable silty loam with large sand or gravel units that truncate abruptly (USDA 2001). The color is typically dark brown to brownish-yellow at the surface and grades towards a yellow-brown below approximately 10 inches. Soils located within the upland forested area of the site are predominantly friable silty loam to silty clay loam (USDA 2001). The color typically ranges from dark brown to yellowish-brown at the surface and grades towards a yellow-brown to red below approximately 10 inches.

Soils on the alluvial terrace of the property are classified as part of the Cidermill, Conotton and Lakin series (USDA 2001). The Cidermill and Conotton series have smooth boundaries and are often mapped together within the same area. The Lakin series is dominantly mapped on the leeward side of major stream valleys. The Conotton series is reported to have 0 to 2% slope variability, while the Cidermill series is reported to have 0% to 6% slope variability. The Lakin series is reported to have the greatest variability where slopes can range from 1% to 40%. Outwash or water-laden materials usually along stream terraces or valleys formed these soils. Each of the mapped soil units in the site area are very deep, well to excessively draining, and with slow to moderate water runoff.

Soils on the upland forested area of the property are classified by the USDA (2001) as part of the Omulga and Vandalia series and the Upshur-Gilpin complex. The Omulga series consists of very deep, moderately well drained soils formed in loess, colluvium, or old alluvium, and in most areas by underlying lacustrine sediments. These soils are on valley fills in abandoned preglacial drainage systems in the Allegheny Plateau that lack glacial influence. The Upshur-Gilpin complex series consists of very deep to moderately deep, well-drained soils formed in residuum derived from siltstone, sandstone, and shale. They are typically located on strongly sloping or steep uplands (ridgetops and hillsides). The Vandalia series consists of very deep, well-drained soils formed in colluvium from shale, siltstone, and some sandstone. They are on foot slopes and colluvial fans.

The Omulga series is reported to have a 2 to 12% slope variability, while the Vandalia series is reported to have 8% to 25% slope variability. The Upshur-Gilpin complex is reported to have the greatest variability where slopes can range from 8% to 50%. Each of the mapped soil units in the site area are very to moderately deep with medium to rapid water runoff.

The USDA NRCS (2001) has described the soil types on the alluvial terrace of the property as the following: The Conotton series is Type IIIs, which indicates special conservation needs with regard to root zone limitation. The Cidermill series soils are Type IIe and Type I. Type IIe indicates moderate conservation needs with regard to erosion, and Type I indicates there are few limitations restricting use. The Lakin series soils are divided as Types IVs, VIs, and VIIs. All these types indicate severe conservation needs with regard to root zone limitations. Reported



building site development information indicates frost action as a limitation for the use of Conotton and Cidermill soils especially for local roads and streets due to low strength. Lakin soils have moderate to severe limitations of all building site development due to slope.

The USDA (2001) has described the soil types in the upland forest of the property range from Type IIe to Type VIIe. This indicates that all soils types in this area have moderate to severe limitations and conservation needs with regard to erosion. Reported building site development information indicates slope, wetness, shrink-swell, and slippage as a moderate to severe limitation for the use of these soils in all aspects of building development.

## **Climate and Vegetation/Wildlife Patterns**

Climactic changes have influenced the patterns of vegetation and wildlife in Meigs County and southeastern Ohio throughout its past history. The effects of the Pleistocene glaciation on Ohio valley flora and fauna have been well documented (Shane 1994; McDonald 1994; Delcourt and Delcourt 1981; Walker and Hartman 1960; Guilday 1967; USDA 1998; and others). Although Meigs County is below the southern extremes of the glaciers themselves, the climactic changes influenced the patterns of vegetation and faunal life along the Ohio River. Once Native Americans moved into the area, they experienced these changes and adapted over time to the northward movement of colder weather vegetation and animals, and the influx of temperate zone flora/fauna. The increasingly continental climate that has developed in the region is characteristically humid and temperate (USDA 1998).

By the end of the Native American habitation of the region and the beginnings of European migration to Meigs County, the region was included in the Eastern Deciduous Forest Province. Much of Meigs County was covered with virgin, mixed hardwood forest (USDA 1998).

### Literature Review

The literature review for this project took place in December 2005. Cultural resources files reviewed at the Ohio Historic Preservation Office (OHPO) in Columbus, Ohio include the National Register of Historic Places (NRHP), Ohio Historic Inventory (OHI), Ohio Archaeological Inventory (OAI), and Cultural Resource Management (CRM) report files. Local historical research was conducted at the Meigs County Library in Pomeroy and at the Public Library of Cincinnati and Hamilton County, a regional history and genealogy center.

The review found that no NRHP properties are located within the project area boundary. Meigs County only has ten properties listed on the NRHP and none are within at least ten kilometers of the project area. Based on the most current data available on the National Park Service NRHP website, two properties are in Chester, one in Alfred, one in Rocksprings, three in Middleport, two in Pomeroy, plus the Buffington Island Civil War site, upriver from the project area near Portland in Lebanon Township.

The OAI site file check documents one archaeological site (33MS288) located inside the project area boundary (Figure 2). The site is located on the Ohio River floodplain, between Route 124 (old Rt 338) and the river, on property associated with an historic period house (now gone, see below) (the Cross House, MEG 384-12). The house had been previously documented by OHS personnel perhaps in 1984, although the OHI form does not list a specific year. Sprague (1992) documented site 33MS288 during a survey for a proposed sand and gravel barge loading facility. The site produced Native American artifacts that date to the Early and Late Archaic, and Adena (Early Woodland) time periods. The Sprague (1992) report does not include a site boundary size, but based on an illustration in that report, the site size measures at least 800 ft (244 m) in diameter. The site produced a continuous scatter of artifacts and apparently encompasses most of the area between Rt 338 and the Ohio River. They conducted some deep testing toward the river side of the site and did not find any evidence of buried archaeological sites (Sprague 1992). The presence of Early Archaic diagnostic artifacts (over 6,000 years old) on the ground surface indicates that at least in this area, the ground surface has been stable for thousands of years. No followup reports are documented at the OHPO and the barge facility was not built in this location. Please see the Results Section for further discussion of this site.

A review of the OAI files for the surrounding area finds that most of the documented archaeological sites are located on the floodplains and terraces of the Ohio River, or along drainages with adjacent terraces. This is more likely because greater attention has been given to the river drainage than the adjacent uplands. Similar terrace/upland settings both up and down river were reviewed.

Only one other archaeological site has been documented along the same floodplain/terrace setting as the project area. Site 33MS005 is landowner reported site located about a mile downstream of the project area. The OAI form does not include any data on artifact types, site size, or time period. Just downstream from the project area, the hills close in on the river and the floodplain shifts to the Kentucky side of the river. Further downstream, but still in Letart Township, the floodplain opens up again on the Ohio side of the Ohio River at Racine. At least eight sites are documented in the Racine vicinity. They include several sites found on upper terraces along a stream that joins the Ohio River at this point, plus several sites on the terraces and floodplain of the Ohio River. These sites include a range of Native American time periods from Paleoindian through Ft Ancient. Site types include a mound, small camp sites and at least one probable village site.

On the first terrace of this downstream area, Graybill (1976) documented Fort Ancient period cultural material (post 1000AD) eroding out of the river bank (33MS31). He examined buried deposits that appear to range from just below plowzone to several feet in depth (less than one meter). These deposits included Late Archaic, Late Woodland, and Ft Ancient material (OAI form).

In the same section of floodplain as site 33MS31, Keener and Pecora (2003) conducted Phase II excavations at site 33MS29. This site is located between Route 124 and the Ohio River on a terrace. The cultural deposits at this site were confined to within one meter of the ground



surface. Similarly to site 33MS31, they encountered a midden/cultural zone between 30 and 70 cm deep. The site produced Late Archaic and Late Woodland artifacts and pottery, along with two radiocarbon date ranges (calibrated intercepts at 1430 and 1520 BC, or Late Archaic in origin).

Upstream of the project area in the Great Bend section of Lebanon Township, several archaeological studies have documented both riverine and upland archaeological sites. Documented during a variety of CRM projects, sites include all Native American time periods from Paleoindian through Fort Ancient (cf. Sewell 2004; Bush et al 1995; Kollecker 1995; or Merry 1980).

Table 1 tabulates the data from the above referenced areas, the Great Bend, the current project area, and downstream of the project area. A total of 80 archaeological sites documented in these three areas are reviewed for relevant data. The 80 sites contain at least 141 individual components. Archaeological components are listed by site type in Table 1 and by setting and time period in Table 2. Table 2 excludes isolated finds and historical period components. Any particular site may have more than one archaeological component. Components are tabulated by quantifying the diagnostic time periods represented at each location.

TIME PERIOD	MOUND	LITHIC SCATTER	-ISOLATED FIND	TOTAL
Paleoindian		3		3
Early Archaic		8		8
Middle Archaic		5		5
Late Archaic/Terminal Archaic		14		14
Early Woodland	·	7		7
Middle Woodland		4		4
Late Woodland		6		6
Undifferentiated Woodland*	5	7		12
Late Prehistoric		6		6
Unknown Prehistoric		43	19	62
Historic, non-aboriginal		14		14
TOTAL	5	117	19	141

#### Table 1. Archaeological components by site type.

\*Undifferentiated Woodland includes unexcavated mounds and sites with untyped pottery sherds.

#### Table 2. Archaeological components sorted by topographic setting.

TIME PERIOD	FLOODPLAIN	TERRACES (ALL)	<b>UPBANDRIDGES</b>
Paleoindian	1	1	1
Early Archaic	2	6	0
Middle Archaic	2	2	1
Late Archaic/Terminal Archaic	3	9	2
Early Woodland	1	6	0
Middle Woodland	2	1	1
Late Woodland	1	4	1
Undifferentiated Woodland Mounds	0	3	2
Natural & Ethical Environmental Solution	s. LLE		Page 8

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TIME PERIOD	FLOODPLAIN	TERRACES (ALL)	UPEAIND/RIDGES
Undifferentiated Woodland-lithic	4	2	1
scatter			
Late Prehistoric	2	3	1
Unknown Prehistoric	2	38	3
TOTAL	20	75	13

A review of Tables 1 and 2 provides important data for evaluating the potential of the Project Area to contain significant archaeological sites. Data on site setting is also important as listed in Table 2. It is important to keep in mind that upland/ridge top data is very likely missing due to lack of studies conducted in those settings. The information is very likely skewed somewhat toward the valley settings. However, the presence of artifacts from almost all the prehistoric cultural time periods in the upland settings indicates that the relative presence is probably accurate, but quantity of sites is lacking.

All Native American time periods are represented in this section of Ohio River valley. Three sites have produced artifacts from the Paleoindian period, the first period of occupation by the Native Americans with dates older than at least 10,000 years ago. These three sites are spread out among all three major topographic settings in the area, floodplain, terrace, and upland/ridge top. This fits well with the overall view of Paleoindians as opportunistic hunters and gatherers.

The Archaic period, represented by three divisions, Early, Middle, and Late, is also well represented in the region with an emphasis on the late Archaic. Middle and Late Archaic components have been found on both river and upland settings.

Woodland period sites are found more commonly on the upper terraces, this includes both mounds and open sites. Mounds and lithic scatter Woodland period sites have also been documented on the nearby ridge tops.

Except for two sites as noted above (33MS29 and 33MS31), all the above referenced archaeological sites are surface sites. Site 33MS31 is situated near the confluence of a stream channel and the Ohio River and was buried just below plowzone level. Reworking of this stream entrance into the Ohio River may have buried this site over time by the accumulation of alluvial material. Site 33MS29 is situated nearby and also has a stream channel that crosses near the site edge.

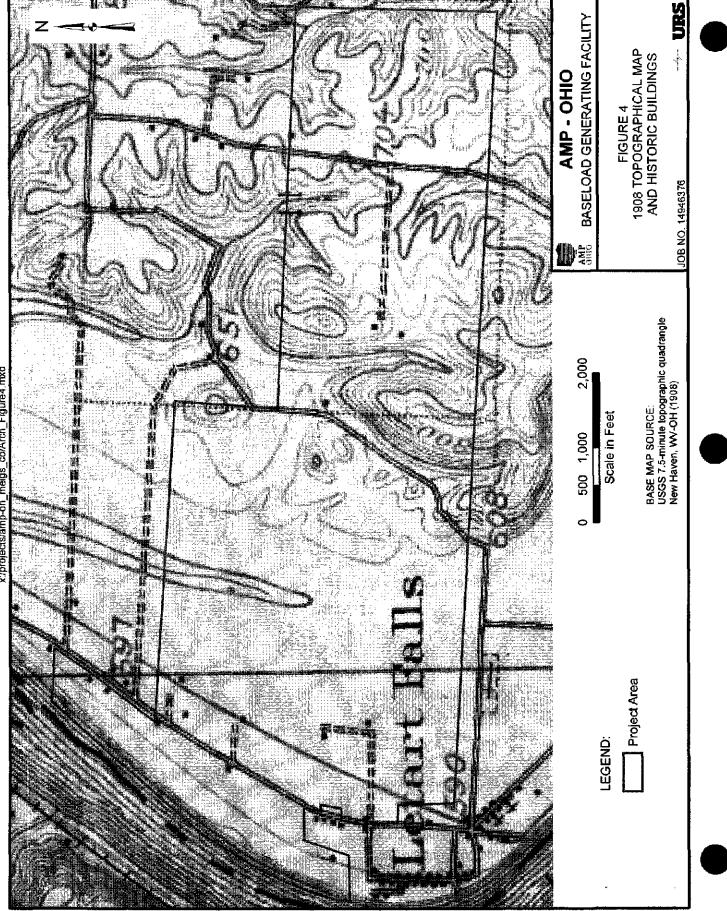
Components from Paleoindian through Fort Ancient have been found on the ground surface, or within the plowzone, on both floodplain and terrace settings both upstream and downstream of the Project Area. The presence of ancient artifacts, over 5,000 years old (Archaic and Paleo) on the ground surface indicates the stable nature of this section of the Ohio River. Areas with Archaic and Paleoindian components on or near the surface are unlikely to contain deeply buried human occupation levels. Site 33MS288 is located within the project area. That site is an extensive surface artifact scatter that has produced Early and Late Archaic, and Adena (Early Woodland) period artifacts from the surface. Project area soils appear stable, although in-depth

analysis of micro-environmental settings will be required to identify areas with possible overbank deposits, buried stream channels, and so forth that may have contributed to the overlay of alluvial deposits in sections of the floodplains and terraces. The Project Area is highly likely to contain both upland and riverine archaeological sites from the Native American occupation of the region. These may range from isolated finds to intensive village sites. It is unlikely that previously unrecorded mounds will be documented.

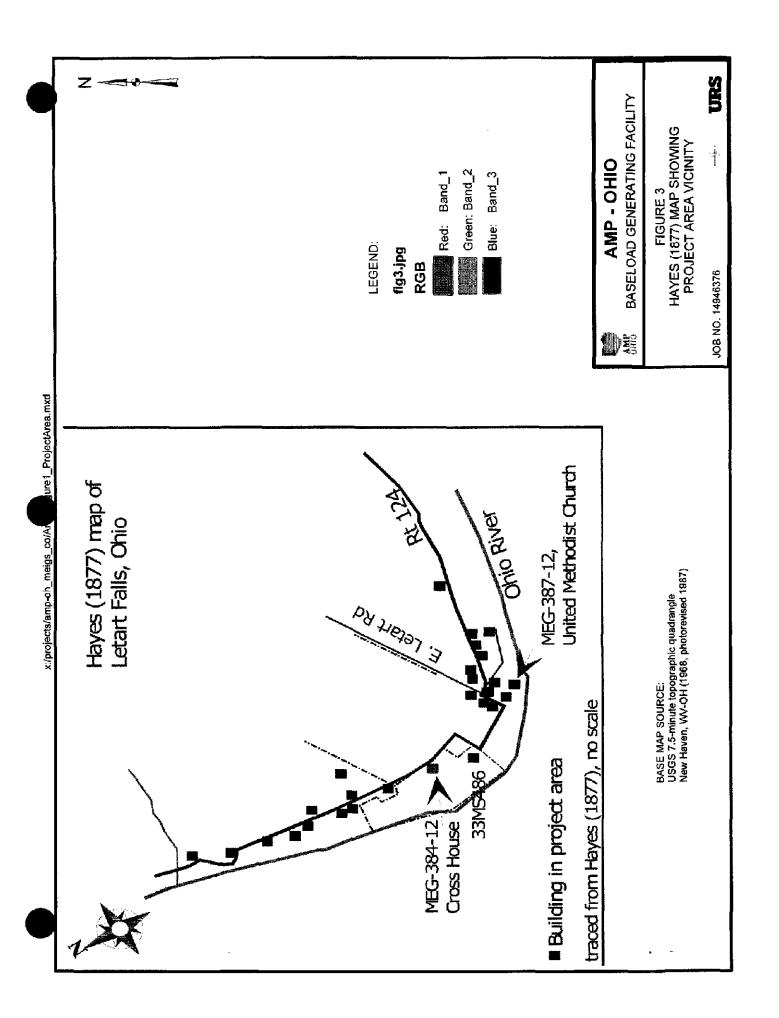
# **Historic Properties**

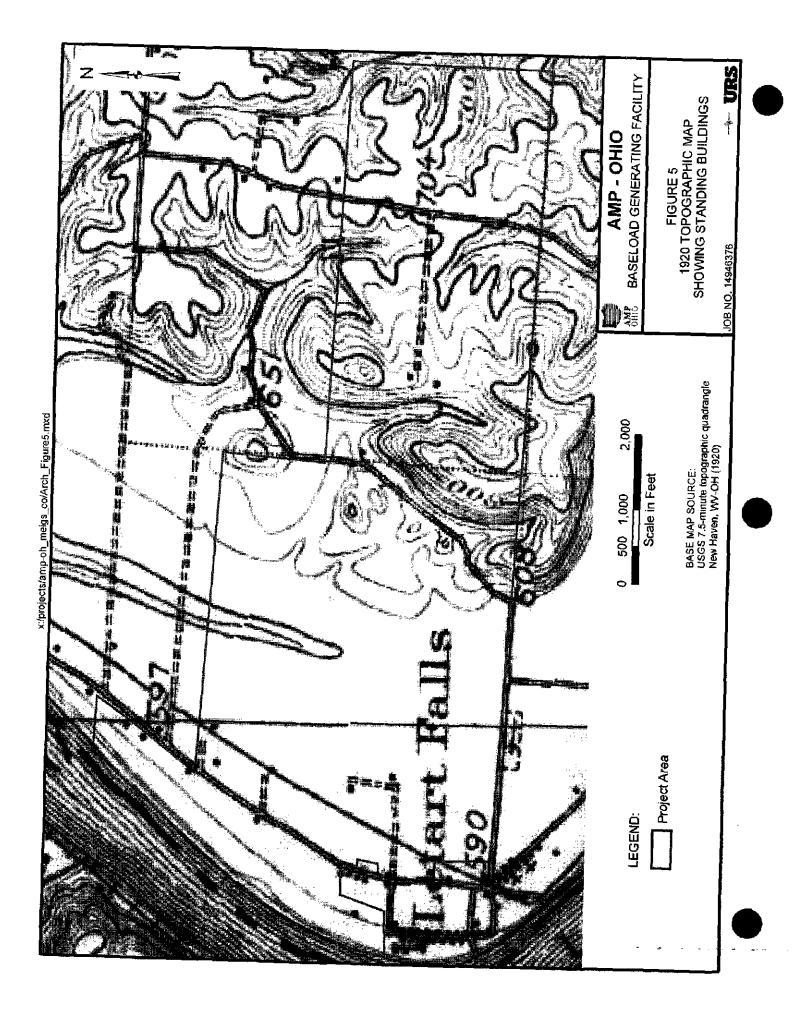
Historically, the project area lies within Letart Township of Meigs County. Primarily a rural area, Meigs County was originally part of the Ohio Company's purchase. The Letart Falls area was settled as early as 1780 and Letart Township was one of the original townships in the county. Truck farming became an important part of the agricultural system for Letart Falls beginning late in the nineteenth century (Ervin 1949, MCPHS 1979). Additional historical context on Letart Falls is included in the Cultural Overview section. Figure 3 illustrates a tracing of the Hayes 1877 *Illustrated Atlas of the Upper Ohio River Valley from Pittsburgh to Cincinnati, Ohio.* Found at the Public Library of Cincinnati and Hamilton County, photographs and copying of the image were not allowed.

The community of Letart Falls was well established by the late 1870s. Only two structures illustrated in the 1877 map fall within the project area (Figure 3). The more southern building corresponds with one historical site (33MS486 discussed in the Results Section). No standing building is currently located in this spot, and no OHI was completed for any property in this immediate vicinity in the early 1980s when the properties listed in Table 3 were documented. Review of the 1908 and 1920 topographic maps for the project area vicinity (Figures 4 and 5) show that the building was still standing at that time. However, a review of the 1950 aerial photo (Figure 6) finds no standing building in that location.



x:/projects/amp-oh\_meigs\_co/Arch\_Figure4.mxd





The second building shown in red on Figure 3 (the more northern building) is most likely the Cross House (MEG-384-12) as documented on an OHI (Table 3 below). This was a brick house that sat adjacent to Route 124 at the same elevation as the road. The house is visible on Figures 4-6). Local informants indicate that this house was torn down and the site mechanically leveled after the 1997 Ohio River flood (Hill family, 2006 personal communication). Today this location is a graveled and graded parking area for farm access along the west side of Route 124.

Further review of the 1908 and 1920 topographic maps and the 1950 aerial photography (Figures 4-6) finds additional properties within the project area. Hill family members have stated that these were small tenant houses that 'came and went in the twentieth century'. Several of these correspond with archaeological sites documented during this survey (See Results Section).

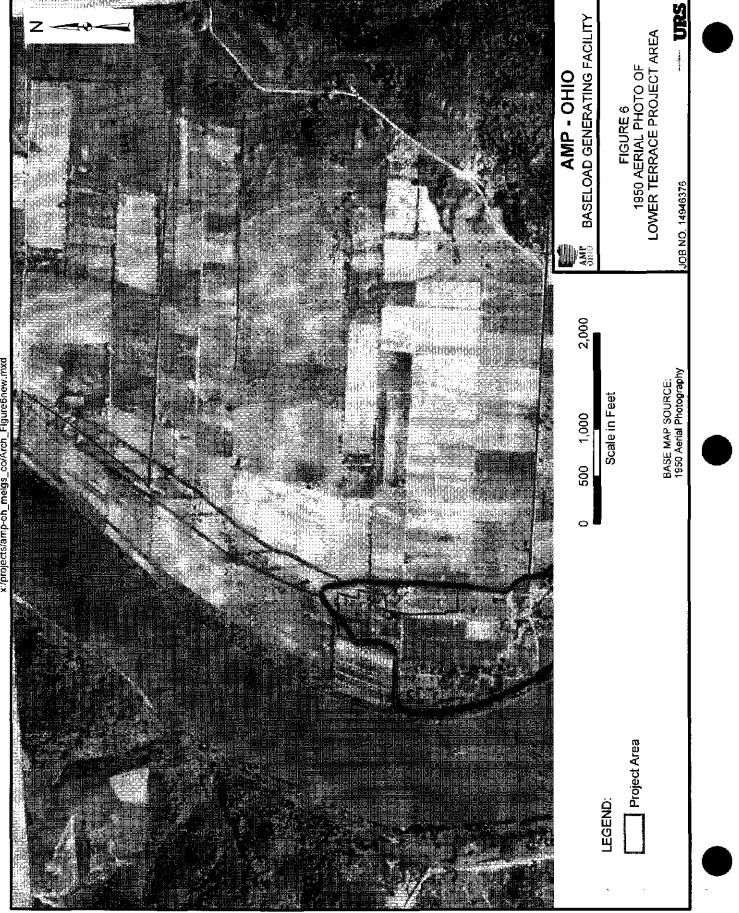
A total of 17 properties (standing buildings) in the Letart Falls vicinity have been documented on OHI forms at the OHPO. The historical resources review is documented in a separate report. That report documents the current status of the OHI listed properties and of other undocumented properties over 50 years old that still stand in the vicinity of the project area. Visual impacts from construction of the facility to those properties are also evaluated in that separate report. Of the 17 OHI properties, 13 are summarized in Table 3. They are the closest listed properties to the project area.

Most of the older buildings in Letart Falls are gone. Many have been replaced by trailers or small prefabricated homes. The Cross House (MEG-384-12, bolded in Table 3) was the only standing structure in the project area. However, as noted above, it was removed and any potential archaeological site destroyed after the 1997 flood.

The OHPO mapping system shows OHI property MEG-387-12 within the project area. However, the original site of this church was named on the Hayes (1877) map (Figure 3). The church was later moved up onto Route 124 but has since been torn down (Patty Pickens, personal communication July 2006).

Historically, the project area is likely to contain archaeological sites that may date to the nineteenth and twentieth centuries. These may include house and outbuilding sites related to the agricultural community of Letart Falls and their related commercial activities.





x:/projects/amp-oh\_melgs\_co/Arch\_Figure6new.mxd

ОНІ #	STYLE/DESIGN	DATE/PERIOD	COMMENTS	CURRENT STATUS
MEG-370-12	Vernacular	Not listed	On Bucktown Rd	Poor condition, vacant
MEG-371-12	Vernacular, hall and parlor	Not listed	On Bucktown Rd	Gone
MEG-372-12	Vernacular, 'Georgian plan'	Circa 1850	On Bucktown Rd	Gone
MEG-373-12	Vernacular 'Cumberland house' wraparound porch	Not listed	On Bucktown Rd	Poor condition, vacant
MEG-374-12	Vernacular, I house	Circa 1830	On Bucktown Rd, reportedly oldest house in Letart Falls	Gone
MEG-375-12	Vernacular, board and batten	Not listed	On Bucktown Rd	Gone
MEG-376-12	Vernacular, pyramidal roof	Circa 1890	Off Bucktown Rd	Gone
MEG-383-12	Vernacular, saltbox roof line	Circa 1850	On Rt124	Fair condition, occupied
MEG-384-12	Vernacular, brick I house	Circa 1860s	Cross House, site	Gone
MEG-387-12	Vernacular, 'Greek Revival touches'	Circa 1865	Letart Falls United Methodist Church	Gone
MEG-388-12	Vernacular, commercial	Not listed	Had been store and post office	Gone
MEG-389-12	Vernacular, end gable	Not listed	Remodeled	Good
MEG-390-12	Vernacular, school	Circa 1930	Brick school building	Poor condition, vacant

# Table 3. OHI properties within or near the project area.

### Cultural Overview

The prehistoric and historical period occupations of the upper Ohio River valley are briefly examined in regard to changing settlement patterns, and cultural and chronological changes.

## Paleoindian Period (c. ?10,000+ - 8,000 BC)

Paleoindian peoples entered the eastern United States after the Wisconsin glacial retreat, during a time of rapid environmental shifting (Seeman et al. 1994; Tankersley 1994). The initial, recognized Paleoindian tradition was the Clovis period, typified by characteristic projectile points and tool kits. Artifact types within the tool kit remained consistent from the western United States into eastern sites (Fitting et al. 1966; MacDonald 1968; Frison 1991).

During the late Paleoindian period, after approximately 10,800-10,000 years Before Present (BP), regional archaeological complexity increased (Ellis and Deller 1988). Regionally specific projectile point styles such as Quad, Dalton, and Hardaway-Dalton replaced the Clovis type (Justice 1987).

Extensive research through the 1980s and 1990s has increased the amount of information available with which to interpret the subsistence strategies, settlement patterns and changing culture of the Paleoindian peoples (c.f. Dancey 1994; Roper and Lepper 1991; Tankersley and Isaac 1990; Ellis and Lothrop 1989). However, the influx of data has led to conflicting interpretations of subsistence and settlement changes in the Ohio valley (Seeman et al. 1994).

What can be agreed upon is that the late Paleoindian sites in the Ohio valley included evidence of a shift toward smaller game with greater regional specialization of tool kits (Tankersley 1994; Seeman et al. 1994). Larger sites such as Welling, Nobles Pond and Sandy Spring have been identified that may indicate aggregation of smaller families or populations at some period during the year (Seeman et al. 1994).

The sites served to illustrate the changing nature of the Paleoindian occupation of the Ohio valley. The ensuing Archaic period continued the shift from an emphasis on larger game pursued in a migratory pattern, to a reliance on more locally available plant and animal resources.

### Archaic Period (c. 8,000 BC-1,500 BC)

The Archaic Period continued the development of region-specific adaptations to local environments begun in the late Paleoindian period. Site investigations indicated that they made use of seasonal camps, often using a base camp with outlying activity/procurement camps, and extractive sites for periodic use throughout the year (Dragoo 1976; Chapman and Otto 1976). Recent excavations at sites such as Henderson (Kozarek et al. 1994) and Manning (Roper and Lepper 1991) indicate that many Archaic sites were utilized repeatedly during this period. They provided base camps situated on stable terraces from which to disperse in search of specific resources (Kozarek at al. 1994:163).

Throughout the Archaic period, the types and quantities of processing tools of all types increased in variety and form. Wood and plant processing tools including groundstone items were plentiful by the Middle Archaic period (generally placed after 6,000 BC). Most artifact data from this time period, however, is based on typological data rather than intact, datable sites (Dragoo 1976).

The Late Archaic period represented a time frame of increasing local complexity and specialization among the various regional groups (Dragoo 1976; Winters 1969; Vickery 1980). Through the Late Archaic period, many aspects of what is called the Woodland period were already becoming apparent by 2,000 BC (Griffin 1978; Winters 1969). Evidence included expanded trade networks, evidence of status differentiation, and possible horticultural activities (Griffin 1978; Driskell 1979; Cowan et al. 1981).

#### Woodland Period (c. 1500 BC - AD 1000)

The Woodland period was marked by significant shifts in subsistence strategy, technological changes, and changing settlement patterns. Divided traditionally into the Early Woodland, Middle Woodland, and Late Woodland periods, those periods have been assigned the time frames: 1500 BC-AD 100, 200BC - AD 500, and AD 500 - AD 1000, respectively. Note that the Early and Middle Woodland periods overlap. Some cultures have been identified as Middle Woodland (ex. Hopewell) while evidence exists that cultures identified as Early Woodland (ex. Adena) continued in other parts of the Ohio Valley.

The Early Woodland period represented a shift in subsistence and settlement strategies by the Native American occupants of the Ohio Valley. Developing horticultural strategies by the Late Archaic peoples led to a significant increase in their use after that time (Yarnell 1973; Cowan et al. 1981). A related development was the use of clay pottery for cooking and storage vessels.

Some burial mounds included significant evidence of social status differentiation. The presence of copper and shell ornaments in burial contexts provided evidence for extensive trade networks among the eastern woodlands and southeast. Referred to as the Adena culture in the Ohio Valley, researchers have found evidence for their settlements on river and stream terraces, with possible winter upland resource extraction. Most research on Adena during the greater part of the twentieth century was on the burial and ceremonial earthworks. Increasing interest in their culture as a whole has increased our knowledge of the Adena (Farnsworth and Emerson 1986).

The Middle Woodland period is defined by the Hopewell complex, probably centered near Chillicothe, Ohio on the Scioto River. Another focus of development was in Illinois (Griffin 1978). The Hopewellian period was characterized by elaborate geometric earthworks, burial mounds, an extensive trade network producing exotic goods, flint bladelets of a particular type, distinctive pottery and other artifacts, and a complex mortuary system. Much of the early research centered on the elaborate earthworks and burial mounds, producing extensive information about the mortuary practices, but little about subsistence or settlement. Recent research has found evidence of smaller habitations in the Ohio Valley, but larger villages such as seen in Illinois have not been identified as yet in Ohio (Genheimer 1994). Subsistence strategies for the Middle Woodland period are still being researched and little substantive interpretation has been agreed upon.

Mound building as a mortuary custom continued throughout the late Woodland period, although on a smaller scale and possibly of a different nature (Seeman 1981; Kreinbrink 1992). Regional settlement patterns become better understood during this time period.

Subsistence strategies included a growing reliance on domesticated plants including squash, seed plants, and maize agriculture by the end of the Late Woodland period (Seeman 1981; Wymer 1992). Wymer (1992) found an intensification and diversity in Late Woodland deposits from a number of Ohio valley sites for this time period. Toward the end of the late Woodland, however, she noted a decrease in diversity as maize increased in importance (Wymer 1992:67).





Much of the identification of Late Woodland manifestations in the upper Ohio Valley have so far been based on ceramic assemblages. Several different pottery types, distinguished primarily by the tempering agent, characterize these assemblages. Southern Ohio is characterized by two cordmarked pottery types, Peters, which can be grit, limestone, or chert tempered; and Chesser which is limestone tempered (Prufer and McKenzie 1966:241; Prufer 1967:12). The Late Woodland lithic assemblage is represented by triangular side notched points, triangular blades, Raccoon side-notched, and Chesser notched points (Seeman 1992; 1981). Chert material was generally obtained from local sources as opposed to higher quality, distant flint sources.

### Fort Ancient Period (AD 1000-AD 1600+)

By 800-900 AD, the bow and arrow may have been introduced into the Ohio Valley (Seeman et. al. 1994). Other changes in settlement and subsistence soon changed the character of the Late Woodland archaeological record. By 1000 AD, the local Native American inhabitants of southwest Ohio practiced maize agriculture, used the bow and arrow, and tempered their pottery with shell instead of grit or limestone. Social and political changes may have also accompanied the technological changes.

The Mississippian period as seen in the Mississippi Valley included large town and mound complexes that influenced and controlled many of their neighbors. Influence reached the Ohio Valley in terms of technological change as mentioned above, and perhaps social changes as well, although those are not as well documented.

During the Fort Ancient period, permanently occupied villages have been documented along most of the major streams and rivers in southern Ohio. Divided into three time frames by many researchers, the Fort Ancient period saw changes in pottery styles and village layout/plans through the more than 600 year period (Griffin 1943; Essenpreis 1982; Cowan 1986; Henderson 1992).

### Historic Period Euro-American Settlement

During the Iroquoian wars of the seventeenth century, many Native groups were pushed or moved out of their traditional homelands. Conflicts among the French, English, the fledgling Colonies, and the Iroquois caused much of Ohio to be depopulated during this period (Hunter 1978). European trade goods are known from some sites in the upper Ohio Valley, including two sites in Greenup County, Kentucky (Pollack and Henderson 1984), down river from the Meigs County, Ohio project area.

At the beginning of the eighteenth century, most of what is now the United States, from the Mississippi River east, had been explored. The Atlantic seaboard was held under the British crown, Florida was controlled by Spain, and the French were established along the Mississippi and St. Lawrence River Valleys (Buck and Buck 1939). However, the upper Ohio Valley still remained relatively unexplored.

Throughout the first half of the eighteenth century, colonial land agents, as well as traders, maintained steadily growing interests in the Ohio area, interests that served to further strain Anglo-French relations. In the latter half of the eighteenth century, after the area was once again populated by Indian groups governed by the Iroquois, it became apparent that control of the mid-continent would rest with whomever controlled its primary east-west access, the Ohio Valley. As a result, in the late 1740s, the Ohio Land Company was organized, and subsequently requested a grant of 500,000 acres from the British crown, part of which included southeastern Ohio. French retaliatory actions included sending Celeron de Blanville to the upper Ohio Valley to reassert French authority in 1749.

Prior to the formal declaration of war between England and France in 1756, the relationship between the two countries continued to deteriorate. Various skirmishes broke out in the early 1750s, culminating in the French and Indian Wars of 1756-1763. The Treaty of 1763 granted the victorious English Canada and the eastern half of the continental United States. The authority of the British over the area was, however, relatively short-lived, since the upper Ohio Valley was shortly embroiled in the American Revolution, which led to a general rising of most of the Ohio tribes. Because Ohio remained largely unsettled by Euro-Americans, Indian hostilities were directed primarily against white strongholds in neighboring states. Although the 1783 Treaty of Paris finalized the American colonists' victory, it did not end the British inspired Indian raids. Furthermore, since the frontier was continually being forced back by land speculators, traders, woodsmen, and settlers, Indian territorial rights, even though nominally protected by the government, were openly ignored by the citizenry.

Following the American Revolution, the peace treaty signed with the British granted the new American nation a boundary that extended not just to the Appalachians, but all the way to the Mississippi River. Along with this territory, the British abandoned their native allies as well, and it was within this context that post-war Indian policy was formulated. The treaty signed at Fort Stanwix in 1784, for example, reflected the notion that the Iroquois has forfeited all claim to their land by fighting with the British against the emerging American nation (Johnson et al. 1979). Prior to the Treaty of Fort Stanwix, the area was still claimed by the Iroquois Confederacy.

Also in the aftermath of the Revolutionary War, several of the original colonies pressed claims on the Ohio territory. In 1794, Virginia relinquished rights to Eastern Ohio, but retained privileges over the land between the Scioto and Little Miami Rivers. Indian title to the balance of the territory was purchased by Congress in 1787, although not until General Mad Anthony Wayne's 1794 victory at the Battle of Fallen Timbers were Indian-settler conflicts somewhat dampened. Wayne's triumphant march defined the Indian treaty boundary spelled out in the 1795 Treaty of Greenville. The line ran roughly on the diagonal from Lake Erie to a point opposite the Kentucky River embouchure (Roseboom and Weisenburger 1973).

This treaty formally marked the beginning of American and Euro-American permanent inhabitance of most of the lands north and west of the Ohio River, although several settlements like Marietta and Losantiville (Cincinnati) were founded as early as 1788. Likewise, the Land Ordinance of 1785 and the 1787 Northwest Ordinance had already delineated how the western lands would be surveyed and governed, respectively. In fact, as early as 1785, a survey of the first seven ranges (vertical rows of townships) of eastern Ohio was undertaken, tracts of which were sold in 1787 (Sherman 1925:52).

# Meigs County – Letart Township

Primarily a rural area, Meigs County was originally part of the Ohio Company's purchase. In 1819, the county was formed out of portions of Athens and Gallia counties (Gerlach and Parker 1977). Letart Township was first organized in 1803 while it was still part of Gallia County. The Letart Falls area was settled as early as 1780 and Letart Township was one of the original townships in the county. The earliest settlers included farmers and flat boat men (Ervin 1949). By 1810, the Sayre family had started the first grist mill, on the Ohio River southwest of Bucktown Road (out of the project area) (Gerlach and Parker 1979). During most of the nineteenth century, local farming remained a subsistence activity with surpluses sold in the local market (MCPHS 1979).

By the late nineteenth century, the coal and salt industries and river transportation work drew away young men from the farms. Local farmers began to shift to increased production in order to produce a livable income. On the terraces around Letart Falls, the light sandy loam was very well suited to certain vegetables and fruits. Strawberries, potatoes and cabbage were the first commercial crops grown in the valley (MCPHS 1979). By the early twentieth century, the farmers were producing good harvests of fruits and vegetables. Strawberries were the major crop in the early twentieth century. Harvesters consisted of primarily local children, paid a few cents per quart to pick the berries. The last strawberries were grown about 1965 (MCPHS 1979). At least some of the smaller houses noted on the 1908 and 1920 topographic maps were probably the homes of sharecroppers and their families during the early boom period of cash/truck farming in the valley (MCPHS 1979).

Modern labor laws and other considerations ended the use of children in the farm fields. Today, immigrant and migrant labor is used to plant, tend, and harvest the fields in the region. By the 1950s-1960s most of the small tenant houses were gone. Some have been replaced by trailers but most have disappeared from the landscape.

Many of the major farms were sold in the 1950s to a coal company, who still hold much of the property in the valley. They leased out the terraces for farming to some of the same families who had previously owned the land. Cash farming is still the major industry, although currently, tomatoes, peppers, watermelon, and squash are the major crops. However, growth of these crops involves major soil movement as the soil is gathered into long, raised platforms in which the plants are grown. Repeated gathering and tilling has impacted the integrity of any sites found in the central portion of the project area, especially east of Route 124 and north of East Letart Road.

# **METHODS**

### Field Methods

The field methods employed general techniques recommended by the Ohio Historic Preservation Office (OHPO) Guidelines (1994) and amended recommendations provided at an OHPO meeting with Ohio consultants in early 1998. Survey of the project area included a combination of surface reconnaissance survey and shovel testing. The scope of work was discussed in a meeting with the OHPO on December 15, 2005. As determined in that meeting, the survey of the Lower Terrace included three main tasks. Each is discussed below regarding methodology.

**TASK 1:** Relocate previously recorded 33MS288 and reassess its horizontal boundary along the Ohio River bank. As recorded, the site encompasses a large field located between Route 124 and the Ohio River (see Results Section) The survey of the site included a surface reconnaissance because the field had been plowed/disked. Transects were walked at less than 5 meter intervals. Artifact locations were marked with pin flags. Additional transects were then walked in the areas that produced artifacts to refine site boundaries. A lathe stake or pin flag marker was placed at the approximate center point of the artifact distribution and marked "Cluster A", and so forth. Surveyors provided by URS then used a GPS unit to map in several of the site clusters within site 33MS288. All observed artifacts were collected, except for modern historic debris, brick fragments, or fire cracked rock.

**TASK 2:** Conduct an archaeological survey of the Lower Terrace Portion of the Project Area, document the presence/absence of previously unrecorded archaeological sites, and make recommendations regarding their eligibility for the National Register of Historic Places.

The Lower Terrace project area was divided into 14 Survey Sections (see Results Section). These sections are based on a combination of field, road, and natural boundaries. In fields with sufficient surface visibility (more than 30%), the crew conducted a surface reconnaissance. Transects were walked at less than 5 meter intervals. Artifact locations were marked with pin flags. Additional transects were then walked in the areas that produced artifacts to refine site boundaries. A lathe stake or pin flag marker was placed at the approximate center point of the artifact distribution and marked "Site 1", and so forth. The diameter of the artifact scatter was noted. Surveyors provided by URS then used a GPS unit to map in the locations of documented sites and several individual datums used during field mapping. The site locations were then accurately plotted onto the figures used in this report.

Where ground surface visibility was insufficient, the crew conducted shovel testing based on a 15 meter (50 foot) grid system. In the Lower Terrace project area, Survey Section 11 was shovel tested. Small portions of Sections Each test was 50 cm in diameter and excavated 10 cm into subsoil or 50 cm in depth. All soil was sifted through 1/4 inch wire mesh. Data on each test including soil profile (depth, Munsell soil color, soil type), location, setting, and

presence/absence of artifacts were noted on shovel test forms. Artifacts were bagged by shovel test coordinate.

A shovel test was excavated at each archaeological site that had more than two artifacts. These tests followed the test parameters described above and recorded data on stratigraphy and depth of plowzone for the recorded sites.

**TASK 3:** Evaluate the Lower Terrace project area regarding geomorphological setting and potential for buried archaeological sites.

URS personnel including Dr. James Nicholas and John Hurd conducted a literature review that included topographic maps, aerial photographs, published geological and soil data, internet resources, and other references in order to best characterize the terrace system in the Lower Terrace Project Area. N&E provided shovel test results to aid in their review. Their results are described in the Results Section.

## <u>Artifact Analysis</u>

**Prehistoric Artifacts:** Artifact analysis included several steps; washing and sorting, catalog preparation, and analysis. Artifacts are listed in the Results Section text. Analysis of the lithic artifacts includes the following tasks:

- identification of raw materials when possible,
- description of morphological characteristics,
- macroscopic examination for evidence of utilization, and
- artifact type description based on physical attributes and assigned functional names such as drill, scraper, and so forth.

In-depth debitage analysis was not included at this level of investigation. References such as Justice (1987) were used for identification of diagnostic projectile points. DeRegnaucourt and Georgiady (1998) provided reference information on chert raw material types.

Analysis of prehistoric artifact assemblages may be used to infer site function, seasonality of occupation settlement patterns and other aspects of prehistoric activities. However, at a Phase I level of investigations, assemblages typically include small amounts of material from spatially separated shovel tests or surface collection transects. At the Phase I level, prehistoric materials provide some information about chronological/cultural affiliation when possible, raw materials usage, and some data on site function. The resulting information is combined with data on site integrity and regional comparisons to make recommendations on potential eligibility for inclusion on the National Register of Historic Places.

Historic Period Artifacts: Historic archaeologists have begun to use material culture to discern how patterns in the archaeological record may provide data on cultural patterns such as economics,

social change, ethnicity, and human choices and behavior (Miller 1991; Cheek and Friedlander 1990; Spencer-Wood 1987).

Phase I artifact recovery methods at rural historic sites routinely include artifacts recovered from surface reconnaissance or from patterned shovel testing. These techniques are designed to provide a sample from which to make inferences about site function, chronology, and to answer research questions designed to determine whether further investigation is warranted.

Artifacts recovered during this project were washed and sorted at the Natural & Ethical Environmental Solutions laboratory. In general, material, morphology and decoration define each artifact. This type of analysis serves to define temporal site affiliation, site function, and assist in answering research questions. References include archaeological manuals, books, and articles such as Jones and Sullivan (1985), Majewski and O'Brien (1987), Samford 1997, Miller et al (2000), Ball (1983), and many others listed individually as needed. The historical archaeological community relies on a large number of books and manuals compiled by collectors and identification experts. These include excellent and well known references such as Godden (1964), McKearin and Wilson (1978), Laidacker (1954 v1 and 2), Camehl (1916), Spargo (1926), McAllister (2001), Hughes (1961), Ketchum (1991), or Gaston (2002). References compiled by or for archaeologists include Jones and Sullivan (1985), Majewski and O'Brien (1987), Miller et al (2000), (Hunter 2001), Samford (1997), and the contents of the Society for Historical Archaeology Journal; *Historical Archaeology*, published quarterly each year. These and many other references provide source material for historic artifact typological and morphological descriptions.

A taxonomic classification system is used to sort and identify the historic artifact assemblage. This system uses the following hierarchical categories: Category, Type, Form, Style, and Description. Each item is defined briefly below.

**Category**: This is the primary sorting column. Items are sorted based on material type. This includes metal, ceramic, faunal, glass, or stone.

**Type:** The Type column subdivides the items by either physical or cultural characteristics. Metal and stone objects are further sorted by type of raw material such as ferrous (containing iron), brass, silver, chert/flint, or limestone. Categories that consist of culturally produced objects such as glass and ceramic are sorted based on physical characteristics and and/or form. Glass artifacts are divided in this column by flat or curved. This sets up the further classification of glass by Form in the next column. Ceramics are defined by type of ware such as Stoneware, Whiteware, Pearlware, or Porcelain. The definition of these types is based on physical characteristics such as firing temperature, and type and color of clay (fabric). The identification of ceramic ware type is based on experience and use of a reference library of both archaeological and collector pictorial resources.

**Form:** Form defines each object morphologically. Ceramics are defined by form when possible, hollow or flat, plate, bowl, etc. Glass is classified by whether it is a container or tableware, or window glass for example. If the container type is identifiable, such as bottle or jar, that is listed here. For metal, terms such as nail, bolt, etc, provide information on morphology.

**Style:** This column provides further detailed information and generally constitutes a subset of the Form column. For example, in the style category, nails (Form category) may be broken down into cut, wire, or wrought. Ceramic styles include decorative techniques such as transfer print or hand painted.

**Description:** The Description Column provides the opportunity to add significant details such as decoration color, size for nails or buttons, or presence of makers' marks or other imprint/embossing.

The overall artifact catalog also records vital information such as provenience, bag number, minimum vessel number for ceramics, artifact dimensions when appropriate, and quantity. The artifact catalog is included in Appendix 1 in its entirety. Individual site collections may also be summarized in the Results Section.