Appendix B

Field Data Sheets

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Appendix B- Stream Habitat Field Sketch Form

Date:	4/15/10
Time:	8:50
Investigator:	AG, JL

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	GAR 1

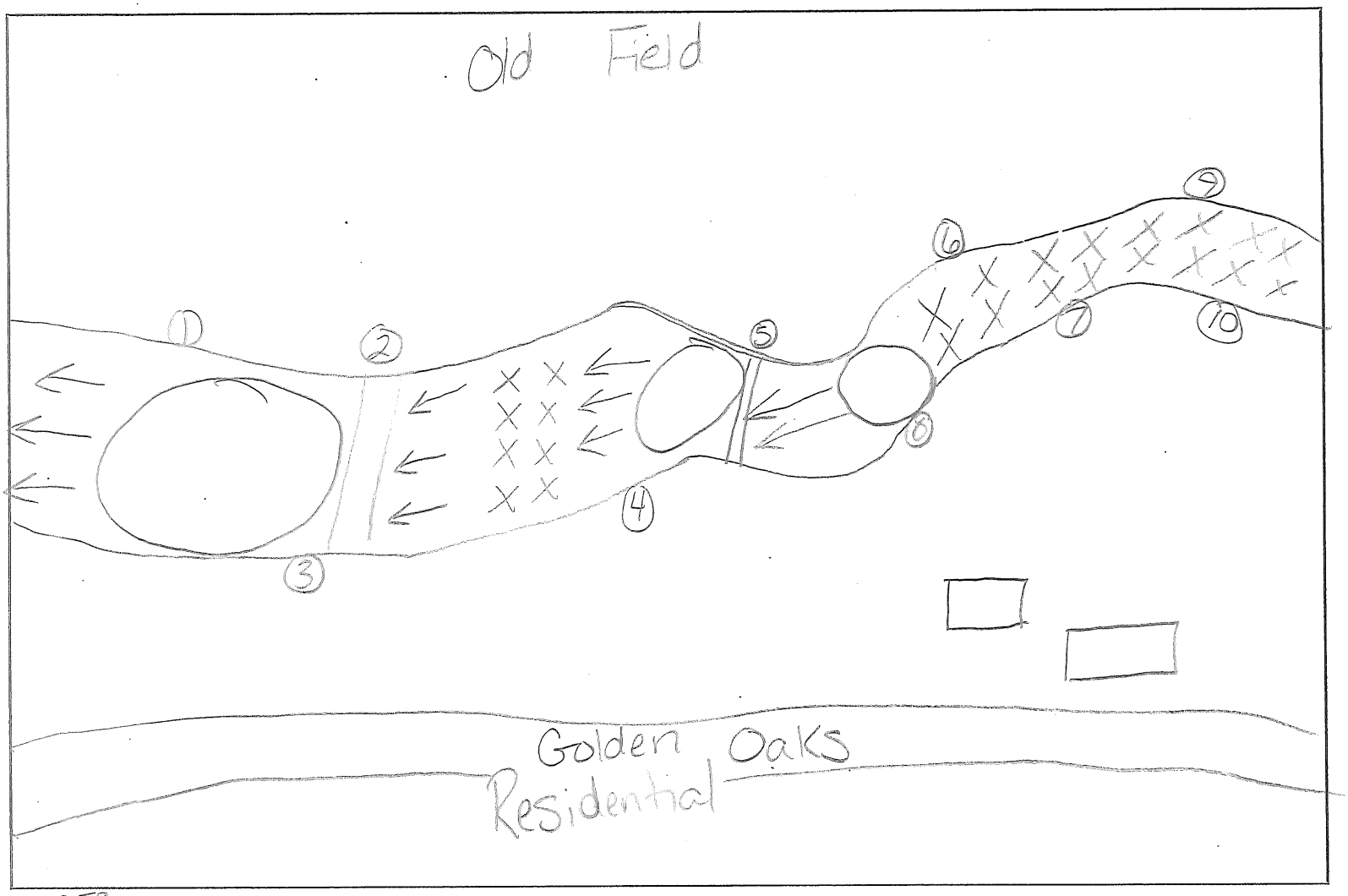
Investigator Signature: Adam Greathouse

Investigator Signature: John A. Lewis

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 SFS
2 Snag
3 SAr
4 SFS
5 Snag
6 SAr
7 C/g
8 CPOM
9 C/g
10. C/g

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation (Rd 1)
Sample Identifier:	GAR
Date:	4/15/10
Time:	8:50
Investigator(s):	AG, JL

Latitude:	39° 51' 08.92" N
Longitude:	80° 18' 54.28" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Precipitation in last 7 days? Y N

Land Use (%)	
Residential	50
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	50
Forest	0
Cropland	0
Pasture	0
Other (explain below in notes)	0
Canopy Cover (%)	15%

Substrate Type	Diameter	% Composition
Bedrock		0
Boulder	>256mm (10")	10
Cobble	64-256mm (2.5"-10")	25
Gravel	2-64mm (0.1"-2.5")	25
Sand	0.06-2mm (gritty)	20
Silt	.004-0.06mm	15
Clay	<0.004mm (slick)	5

Physiochemical Data	
Stream Width (feet)	20.0
Wetted Stream Width (feet)	8.0
Stream Depth (feet)	0.28
pH	7.98
Temperature (°C)	8.0
Conductivity (µS)	257
D.O.(mg/L)	14.31
Velocity (ft/sec.)	0.55
%CPOM	<5%
%FPOM	0

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	13
2. Epifaunal Substrate (riffle quality)	15
3. Pool Substrate Characterization	13
4. Pool Variability	10
5. Channel Alteration	14
6. Sediment Deposition	10
7. Channel Sinuosity	7
8. Channel Flow Status	12
9. Condition of Banks (both banks combined)	6
10. Bank Veg. Protection (both banks combined)	8
11. Grazing/Other Disruptive Pressure	10
12. Riparian Veg. Zone Width (both banks combined)	4
Total Score (maximum=240)	127
Total / 240 x 100 = Habitat Score	53%

% Morphology Types	
Riffle	45
Pool	30
Run	25

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	3
Snag	2
CPOM	1
SAV	2
Sand/Fine Sediment	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- Tipulidae, Hydropsychidae, Cambaridae, Physidae, Heptageniidae, "Psphenidae
- There's a "brown algae" in the stream that is coating the large substrate in the riffles
- Majority of macros obs. were found in the riffles
- No large numbers of macros obs.
- Fish obs

543.08 gpm

Investigator(s) Signature:

Adam Geathauer

John A. Lewis

Pebble Count

Inches		Particle	Millimeters	
	Sand	Silt/clay	0.062				
		Very Fine	0.062 - 0.13				
		Fine	0.13 - 0.25				
		Medium	.25 - .50				
		Coarse	.50 - 1.0				
.04 - .08		Very Coarse	1.0 - 2.0				
0.8 - .16	Gravel	Very Fine	2.0 - 4.0				
.16 - .22		Fine	4.0 - 6.0				
.22 - .31		Fine	6.0 - 8.0	
.31 - .44		Medium	8.0 - 11.0				
.44 - .63		Medium	11.0 - 16.0				
.63 - .89		Coarse	16 - 22		
.89-1.3		Coarse	22 - 32		
1.3 - 1.8		Very Coarse	32 - 45		
1.8 - 2.5		Very Coarse	45 - 64		
2.5 - 3.5	Cobble	Small	64 - 90				
3.5 - 5.0		Small	90 - 128	
5.0 - 7.1		Large	128 - 180				
7.1 - 10.1		Large	180 - 256				
10.1 - 14.3	Boulder	Small	256 - 362	
14.3 - 20		Small	362 - 512	
20 - 40		Medium	512 - 1024	
40 - 80		Large-Vry Large	1024 - 2048	
		Bedrock		

Sample Name: GAR 1 (Rd. 1) 100

Investigator Signature Adam Breathwaite

Investigator Signature John A. Lewis

5600-PM-MR0324 Rev. 9/2008

FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Garner Run 40643

Stream NHD #: 05020005000194

Sample Date: 4/15/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): A. Greathouse, J. Lewis

Comments: GAR 1

Starting Lat/Long: 39° 51' 10.429" N / 80° 18' 52.475" W
Ending Lat/Long: 39° 51' 7.779" N / 80° 18' 54.310" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	3
Snag	2
Coarse Particulate Organic Matter	1
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Ameletidae		*Ameletus*	U	CG	0		1						
Ephemeroptera		Heptageniidae		*Epeorus*	U	SC	0		2						
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		1						
Plecoptera		Perlodidae		*Isoperla*	U	PR	2		1						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		3						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		10						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		2						
Coleoptera		Psephenidae		*Ectopria*	U	SC	5		1						
Diptera		Chironomidae	M			CG	6	126							
Diptera		Ceratopogonidae		*Probezzia*	M	PR	6		1						
Diptera		Simuliidae	*			FC	6	10							
Diptera		Simuliidae		*Simulium*	*	FC	6		20						
Diptera		Tipulidae		*Tipula*	*	SH	4		1						
Diptera		Tipulidae		*Hexatoma*	*	PR	2		1						
Bivalvia		Corbiculidae	U			FC	4	4							
Annelida		Oligochaeta	*			CG	10	2							
				Total Number of Individuals:				142	44	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America* (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	2/8/11
Time:	11:00 AM
Investigator:	SG MG

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	GAR 1

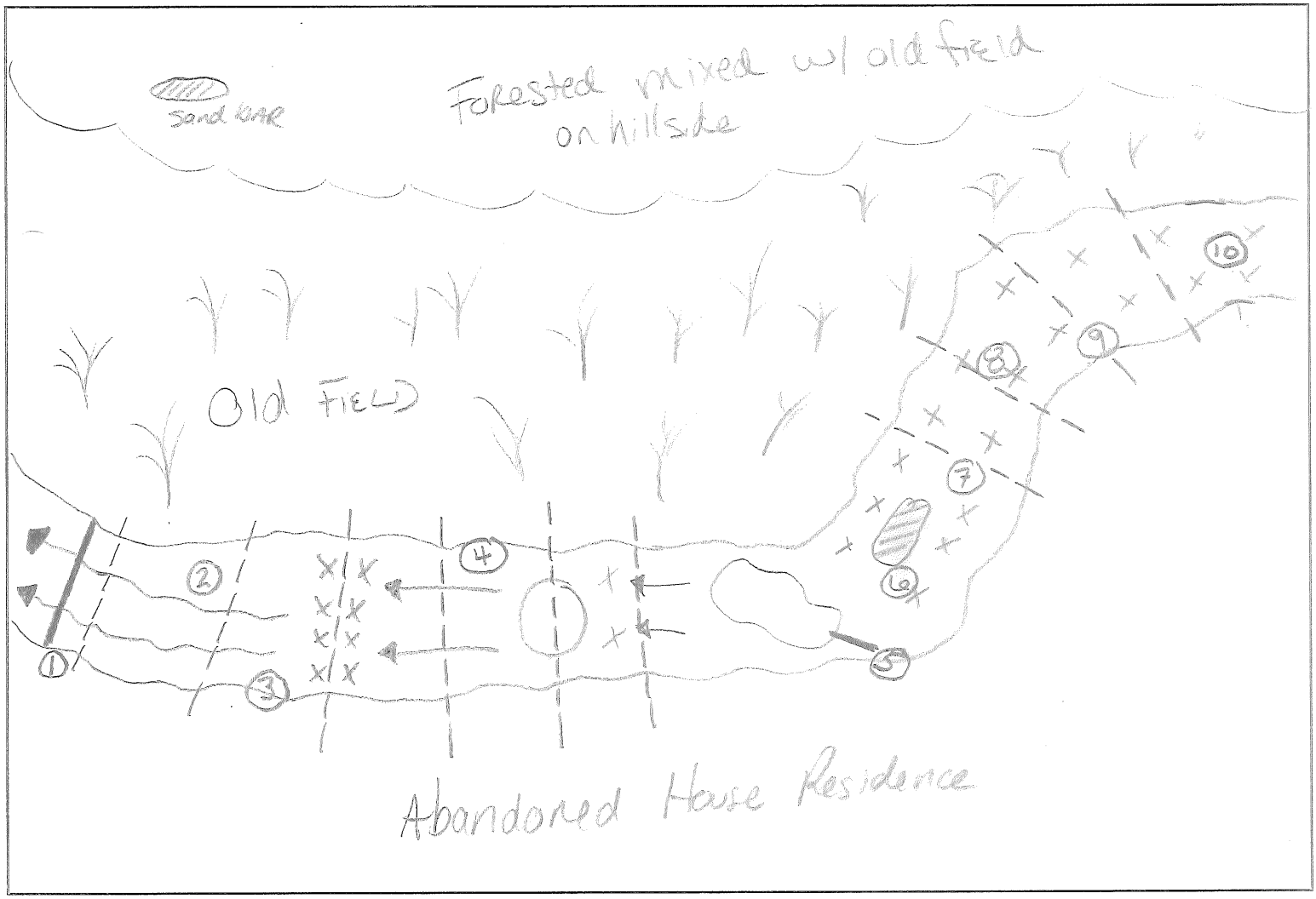
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 SNAG
2 SFS
3 SAV
4 SFS
5 SNAG
6 SAV
7 CIG
8 CIG
9 SAV
10 CIG

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	ISAR 7
Date:	2/8/11
Time:	11:00 AM
Investigator(s):	SLJ MB

Latitude:	39° 51' 9.35" N
Longitude:	80° 18' 54.28" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	Ø
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Old Fields/Old Pasture	40
Forest	10
Cropland	Ø
Pasture	Ø
Other (explain below in notes)	50
Canopy Cover (%)	20%

Substrate Type	Diameter	% Composition
Bedrock		5
Boulder	>256mm (10")	10
Cobble	64-256mm (2.5"-10")	30
Gravel	2-64mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	20
Silt	.004-0.06mm	5
Clay	<0.004mm (slick)	Ø

Physiochemical Data	
Stream Width (feet)	12.5
Wetted Stream Width (feet)	9.0
Stream Depth (feet)	0.59
pH	7.99
Temperature (°C)	1.6
Conductivity (µS)	203
D.O.(mg/L)	14.32
Velocity (ft/sec.)	1.68
%CPOM	0 %
%FPOM	0 %

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	16
2. Epifaunal Substrate (riffle quality)	16
3. Pool Substrate Characterization	10
4. Pool Variability	9
5. Channel Alteration	19
6. Sediment Deposition	11
7. Channel Sinuosity	4
8. Channel Flow Status	17
9. Condition of Banks (both banks combined)	6
10. Bank Veg. Protection (both banks combined)	11
11. Grazing/Other Disruptive Pressure	14
12. Riparian Veg. Zone Width (both banks combined)	11
Total Score (maximum=240)	144
Total / 240 x 100 = Habitat Score	60%

% Morphology Types	
Riffle	50
Pool	10
Run	40

Habitat Sampled[1]	Number of kicks	
Cobble/Gravel	III	3
Snag	II	2
CPOM	Ø	0
SAV	III	3
Sand/Fine Sediment	II	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- 50% land use occurs on LB w/ an abandoned House Residence.
- Sand bars & sediment present along banks & in middle of stream
- Salamanders obs.
- RB old field w/ mixed Forest
- some trees along banks creating a presence but not strong presence of Riparian
- Fish obs.
- macros obs. phyrganeidae, Hydropsychidae, Gomphidae, Chironomidae

Flow: 4003.92 gpm

D	V
.35	.58
.71	1.83
.90	2.57
.90	2.45
.50	1.83
.16	.24

Investigator(s) Signature:

Revised 6/09

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation Rd #2

Stream Name: GARNER RUN

Stream ID#: 40643

Segment ID:

Station ID: GAR 1

Sample Date: 2/8/11

Sampler(s): SG MB

[X] Pre-Mining

[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run	Pool/Glide	
Fines	Silt/Clay	<0.062	IIII	II	6
Sand	Very Fine	0.062 - 0.125	III	III	6
	Fine	0.125 - 0.25	III	II	5
	Medium	0.25 - 0.50	~~IIII~~ III	II	10
	Coarse	0.5 - 1.00	II	I	3
	Very Coarse	1.00 - 2.00	I		1
Gravel	Very Fine	2.00 - 4.00	~~IIII~~ III		8
	Fine	4.00 - 5.70	III		3
	Fine	5.70 - 8.00	IIII		4
	Medium	8.00 - 11.3	III		3
	Medium	11.3 - 16.0	II		2
	Coarse	16.0 - 22.6	IIII		4
	Coarse	22.6 - 32.0	~~IIII~~ I		6
	Very Coarse	32.0 - 45.0	II		2
	Very Coarse	45.0 - 64.0	~~IIII~~ III		8
Cobble	Small	64.0 - 90.0	~~IIII~~ ~~IIII~~ I		11
	Small	90.0 - 128	II		2
	Large	128 - 180	~~IIII~~ I		6
	Large	180 - 256	~~IIII~~		4
Boulder	Small	256 - 362	~~IIII~~ I		6
	Small	362 - 512			
	Medium	512 - 1,024			
	Large	1,024 - 2,048			
Bedrock	Large	>2,048			
		Totals:	90	10	100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Garner Run 40643

Stream NHD #: 05020005000194

Sample Date: 2/8/2011

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S. Gill / M. Benson

Comments: GAR 1

Starting Lat/Long: 39° 51' 10.429" N / 80° 18' 52.475" W

Ending Lat/Long: 39° 51' 7.779" N / 80° 18' 54.310" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	3
Snag	2
Coarse Particulate Organic Matter	0
Submerged Aquatic Vegetation	3
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1- 6		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Plecoptera		Capniidae		*Allocapnia*	U	SH	3		3						
Plecoptera		Perlodidae		*Diploperla*	U	PR	2		1						
Trichoptera		Phryganeidae		*Ptilostomis*	U	SH	5		3						
Trichoptera		Limnephilidae		*Hydatophylax*	U	SH	2		1						
Trichoptera		Limnephilidae		*Pycnopsyche*	U	SH	4		1						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		19						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		1						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		1						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		1						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		2						
Diptera		Chironomidae	M			CG	6	180							
Diptera		Ceratopogonidae	M			PR	6	2							
Diptera		Simuliidae		*Simulium*	*	FC	6		1						
Diptera		Tipulidae		*Pilaria*	*	PR	7		1						
Diptera		Tipulidae		*Dicranota*	*	PR	3		2						
Diptera		Tipulidae		*Erioptera*	*	CG	7		2						
Diptera		Sciomyzidae	*			PR	10	1							
Bivalvia		Sphaeriidae	U			FC	8	1							
Gastropoda		Physidae	U			SC	8	2							
Gastropoda		Lymnaeidae	U			SC	7	1							
Annelida		Oligochaeta	*			CG	10	2							
				Total Number of Individuals:				189	39	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	4/15/10
Time:	11:35
Investigator:	AG, JL

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	GAR 3

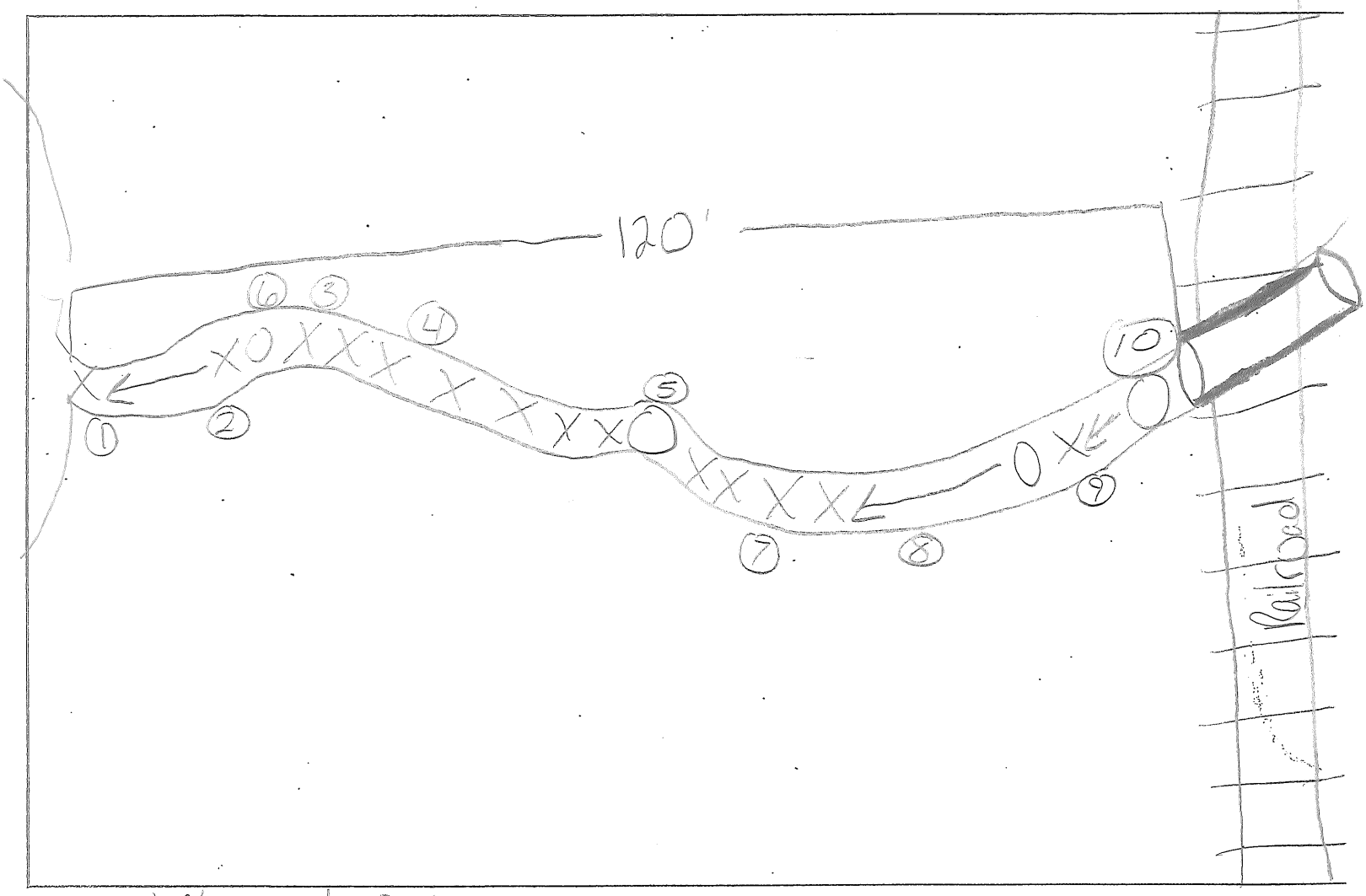
Investigator Signature: Adam Deschiavo

Investigator Signature: John A. Lewis

LEGEND

Riffle = X
Pool = O
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 C/g	6 SAV
2 C/g	7 C/g
3 C/g	8 C/g
4 C/g	9 C/g
5 SFS	10 SFS

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WALLACE & PANCHER, INC.

Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	GAR 3
Date:	4/15/10
Time:	11:35
Investigator(s):	AG, JL

Latitude:	39° 50' 39.63" N
Longitude:	80° 19' 01.76" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	X
Mainstem:	

Precipitation in last 7 days? (Y) N

Land Use (%)	
Residential	0
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	20
Old Fields/Old Pasture	80
Forest	0
Cropland	0
Pasture	0
Other (explain below in notes)	0
Canopy Cover (%)	< 5%

Substrate Type	Diameter	% Composition
Bedrock		0
Boulder	>256mm (10")	5
Cobble	64-256mm (2.5"-10")	15
Gravel	2-64mm (0.1"-2.5")	40
Sand	0.06-2mm (gritty)	25
Silt	.004-0.06mm	15
Clay	<0.004mm (slick)	0

Physiochemical Data	
Stream Width (feet)	2.3
Wetted Stream Width (feet)	0.9
Stream Depth (feet)	0.7
pH	8.20
Temperature (°C)	10.2
Conductivity (µS)	214
D.O.(mg/L)	14.30
Velocity (ft/sec.)	0.48
%CPOM	0
%FPOM	0

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	5
2. Epifaunal Substrate (riffle quality)	9
3. Pool Substrate Characterization	12
4. Pool Variability	5
5. Channel Alteration	8
6. Sediment Deposition	14
7. Channel Sinuosity	7
8. Channel Flow Status	7
9. Condition of Banks (both banks combined)	12
10. Bank Veg. Protection (both banks combined)	14
11. Grazing/Other Disruptive Pressure	18
12. Riparian Veg. Zone Width (both banks combined)	12
Total Score (maximum=240)	123
Total / 240 x 100 = Habitat Score	51%

% Morphology Types	
Riffle	70
Pool	10
Run	20

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	7
Snag	0
CPOM	0
SAV	1
Sand/Fine Sediment	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- Channel is roughly 120' long before it goes through a culvert below the RR
- 40' of the 120' is completely covered by over-hanging Multi-flora Rose
- Few macros obs: Tipulidae, Perlodidae, Cambaridae, Chironomidae
- Fan-tail Darter obs
- H_2O barely flows over the brim of the D-frame

12.6 gpm

Investigator(s) Signature:

Adam Graetzer

John A. Lewis

Pebble Count

Inches		Particle	Millimeters	
	Sand	Silt/clay	0.062	
		Very Fine	0.062 - 0.13	
		Fine	0.13 - 0.25	
		Medium	.25 - .50	
		Coarse	.50 - 1.0	
.04 - .08		Very Coarse	1.0 - 2.0	
0.8 - .16	Gravel	Very Fine	2.0 - 4.0	
.16 - .22		Fine	4.0 - 6.0	
.22 - .31		Fine	6.0 - 8.0	
.31 - .44		Medium	8.0 - 11.0	
.44 - .63		Medium	11.0 - 16.0	
.63 - .89		Coarse	16 - 22	
.89-1.3		Coarse	22 - 32	
1.3 - 1.8		Very Coarse	32 - 45	
1.8 - 2.5		Very Coarse	45 - 64	
2.5 - 3.5	Cobble	Small	64 - 90	
3.5 - 5.0		Small	90 - 128	
5.0 - 7.1		Large	128 - 180	
7.1 - 10.1		Large	180 - 256	
10.1 - 14.3	Boulder	Small	256 - 362	
14.3 - 20		Small	362 - 512	
20 - 40		Medium	512 - 1024	
40 - 80		Large-Vry Large	1024 - 2048	
		Bedrock		

Sample Name: GAR 3 (Rd. 1) 100

Investigator Signature Adam Mathews

Investigator Signature John A Lewis

5600-PM-MR0324 Rev. 9/2008

FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Trib 40646 to Garner Run

Stream NHD #: 05020005003537

Sample Date: 4/15/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): A. Greathouse, J. Lewis

Comments: GAR 3

Starting Lat/Long: 39° 50' 37.630" N / 80° 18' 58.399" W
Ending Lat/Long: 39° 50' 39.434" N / 80° 19' 1.858" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	7
Snag	0
Coarse Particulate Organic Matter	0
Submerged Aquatic Vegetation	1
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-8		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Leptophlebiidae	U			CG	4	2							
Ephemeroptera		Ameletidae		*Ameletus*	U	CG	0		4						
Ephemeroptera		Heptageniidae		*Epeorus*	U	SC	0		1						
Plecoptera		Perlodidae	U			PR	2	2							
Plecoptera		Perlodidae		*Isoperla*	U	PR	2		17						
Plecoptera		Chloroperlidae		*Sweltsa*	U	PR	0		5						
Plecoptera		Nemouridae	U			SH	2	1							
Plecoptera		Nemouridae		*Amphinemura*	U	SH	3		25						
Plecoptera		Nemouridae		*Ostrocerca*	U	SH	2		1						
Plecoptera		Leuctridae		*Leuctra*	U	SH	0		2						
Trichoptera		Limnephilidae	U			SH	4	1							
Trichoptera		Limnephilidae		*Anabolia*	U	SH	5		9						
Trichoptera		Limnephilidae		*Pycnopsyche*	U	SH	4		1						
Trichoptera		Limnephilidae		*Ironoquia*	U	SH	3		2						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		1						
Diptera		Chironomidae	M			CG	6	79							
Diptera		Ceratopogonidae	M			PR	6	1							
Diptera		Ceratopogonidae		*Ceratopogon*	M	PR	6		4						
Diptera		Dixidae		*Dixella*	*	CG	1		1						
Diptera		Tipulidae		*Tipula*	*	SH	4		1						
Gastropoda		Lymnaeidae	U			SC	7	1							
Decapoda		Cambaridae		*Cambarus*	*	CG	6		7						
Annelida		Oligochaeta	*			CG	10		2						
				Total Number of Individuals:				87	83	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America (*Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date: 2/8/11	
Time: 1:00 pm	
Investigator: SG MB	

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	GAR 3

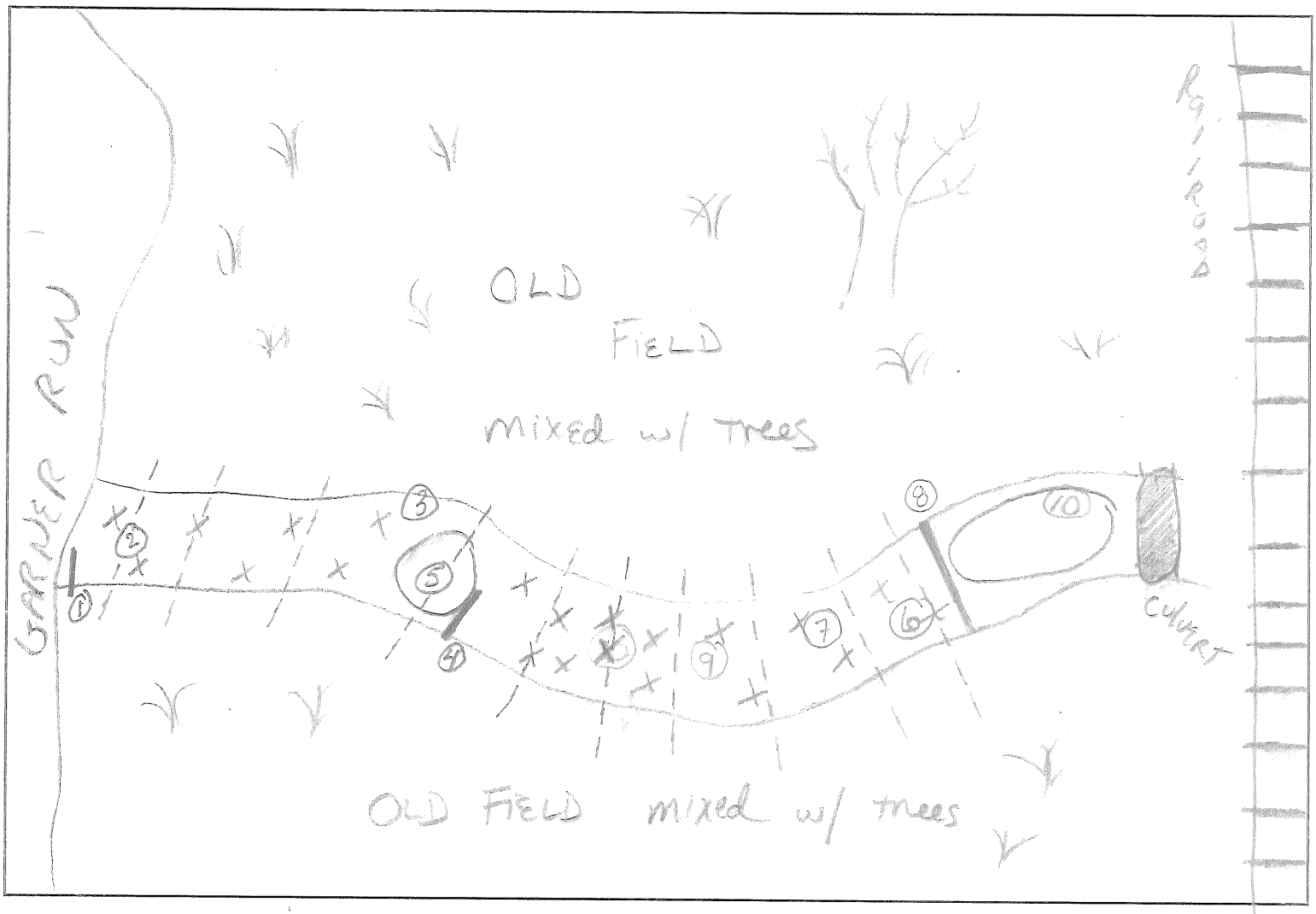
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 SNAG
2 CIG
3 SAV
4 SNAG
5 CROM
6 SAV
7 CIG
8 SNAG
9 CIG
10 SES

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	LGAR 3
Date:	2/9/11
Time:	1:00 pm
Investigator(s):	SLS MB

Latitude:	39° 50' 39.67" N
Longitude:	80° 19' 1.97" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary: X

Mainstem:

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	Ø
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Old Fields/Old Pasture	60
Forest	40
Cropland	Ø
Pasture	Ø
Other (explain below in notes)	Ø
Canopy Cover (%)	5%

Substrate Type	Diameter	% Composition
Bedrock		Ø
Boulder	>256mm (10")	Ø
Cobble	64-256mm (2.5"-10")	5
Gravel	2-64mm (0.1"-2.5")	50
Sand	0.06-2mm (gritty)	35
Silt	.004-0.06mm	10
Clay	<0.004mm (slick)	Ø

Physiochemical Data	
Stream Width (feet)	2.8
Wetted Stream Width (feet)	2.2
Stream Depth (feet)	0.11
pH	7.8
Temperature (°C)	2.6
Conductivity (µS)	193.2
D.O.(mg/L)	13.49
Velocity (ft/sec.)	1.39
%CPOM	5%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	2
2. Epifaunal Substrate (riffle quality)	13
3. Pool Substrate Characterization	10
4. Pool Variability	4
5. Channel Alteration	11
6. Sediment Deposition	16
7. Channel Sinuosity	3
8. Channel Flow Status	13
9. Condition of Banks (both banks combined)	8
10. Bank Veg. Protection (both banks combined)	13
11. Grazing/Other Disruptive Pressure	16
12. Riparian Veg. Zone Width (both banks combined)	16
Total Score (maximum=240)	121
Total / 240 x 100 = Habitat Score	50%

% Morphology Types	
Riffle	85
Pool	15
Run	Ø

Habitat Sampled[1]	Number of kicks	
Cobble/Gravel	///	3
Snag	///	3
CPOM	/	/
SAV	//	2
Sand/Fine Sediment	/	/

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- sampling reach length ~ 60ft.
- stream flows out of culvert from under hill w/ railroad at top of hill
- banks very unstable
- two pools present throughout reach
- macros obs: tipulidae, chironomidae, plecoptera

Flow = 150.98 gpm

D	V
.02	1.10
.18	2.06
.060	1.01

Investigator(s) Signature:

Revised 6/09

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation Rd. #2

Stream Name: GARNER RUN

Stream ID#: 406416

Segment ID:

Station ID: GAR 3

Sample Date: 2/8/11

Sampler(s): SG MB

[X] Pre-Mining

[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run	Pool/Glide	
Fines	Silt/Clay	<0.062	卌 卌	卌	14
Sand	Very Fine	0.062 - 0.125	卌	𝍸	8
	Fine	0.125 - 0.25	卌	𝍸	7
	Medium	0.25 - 0.50	卌		5
	Coarse	0.5 - 1.00	卌		5
	Very Coarse	1.00 - 2.00	𝍸		2
Gravel	Very Fine	2.00 - 4.00	卌 卌 𝍸		13
	Fine	4.00 - 5.70	卌 𝍸		8
	Fine	5.70 - 8.00	卌		5
	Medium	8.00 - 11.3	卌		5
	Medium	11.3 - 16.0	𝍸		4
	Coarse	16.0 - 22.6	卌 𝍸		6
	Coarse	22.6 - 32.0	𝍸		4
	Very Coarse	32.0 - 45.0	卌		5
	Very Coarse	45.0 - 64.0	𝍸		2
Cobble	Small	64.0 - 90.0	卌		5
	Small	90.0 - 128	𝍸		2
	Large	128 - 180			
	Large	180 - 256			
Boulder	Small	256 - 362			
	Small	362 - 512			
	Medium	512 - 1,024			
	Large	1,024 - 2,048			
Bedrock	Large	>2,048			
		Totals:	90	10	100

5600-PM-MR0324 Rev. 9/2008

FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Trib 40646 to Garner Run

Stream NHD #: 05020005003537

Sample Date: 2/8/2011

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S. Gill / M. Benson

Comments: GAR 3

Starting Lat/Long: 39° 50' 37.630" N / 80° 18' 58.399" W
Ending Lat/Long: 39° 50' 39.434" N / 80° 19' 1.858" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	3
Snag	3
Coarse Particulate Organic Matter	1
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	1

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1- 4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Leptophlebiidae	U			CG	4	1							
Plecoptera		Capniidae		*Allocapnia*	U	SH	3		3						
Plecoptera		Nemouridae		*Ostrocerca*	U	SH	2		1						
Trichoptera		Limnephilidae	U			SH	4	1							
Trichoptera		Limnephilidae		*Ironoquia*	U	SH	3		22						
Diptera		Chironomidae	M			CG	6	136							
Diptera		Ceratopogonidae	M			PR	6	1							
Diptera		Simuliidae		*Prosimulium*	*	FC	2		4						
Diptera		Simuliidae		*Stegopterna*	*	FC	6		12						
Annelida		Oligochaeta	*			CG	10	1							
				Total Number of Individuals:				140	42	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	4/16/10
Time:	10:35
Investigator:	AG, JL

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	GAR 7

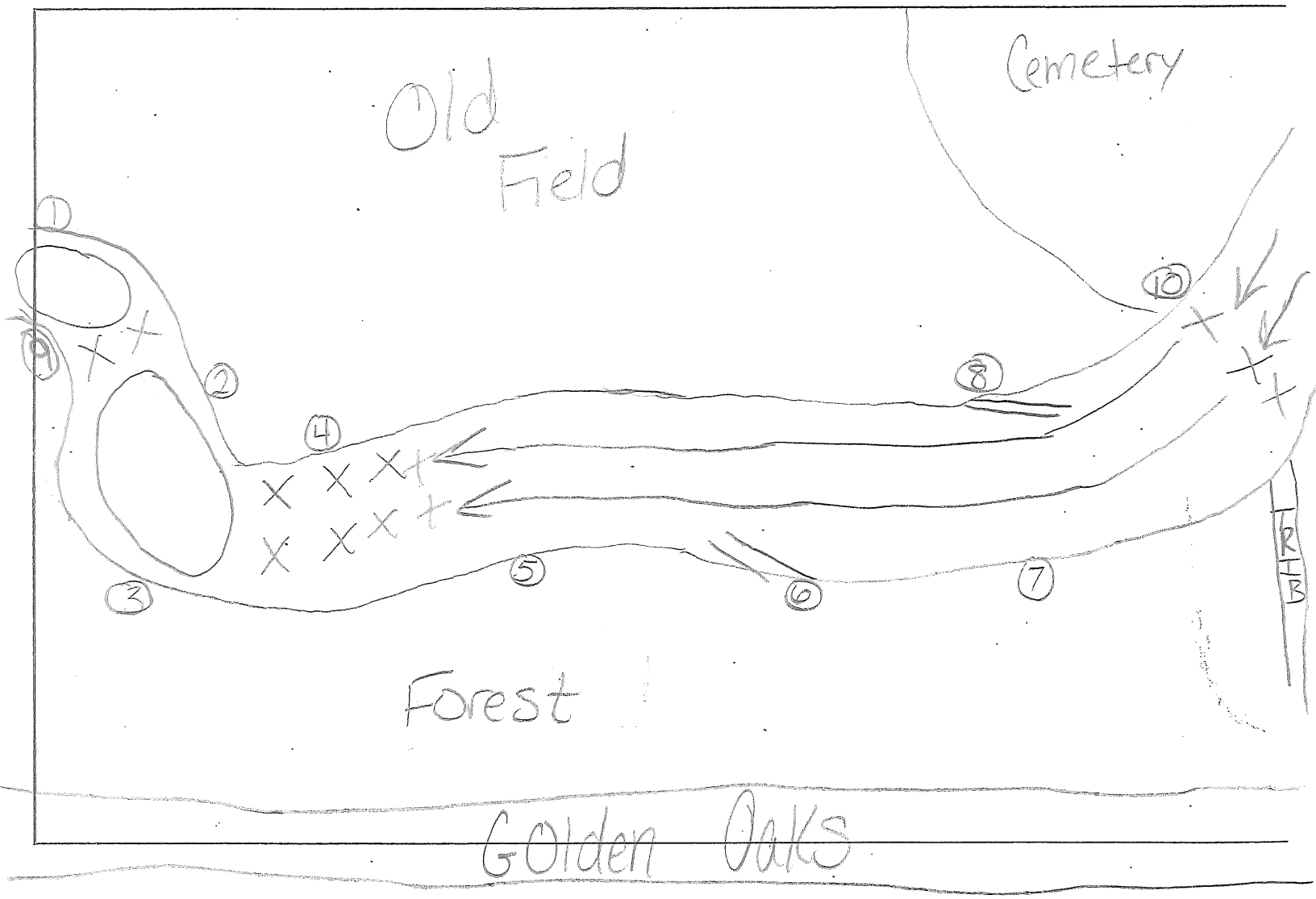
Investigator Signature: Adam Dieathorne

Investigator Signature: John A. Lewis

LEGEND

Riffle = X
Pool = 0
Run = ⟶
Snag = ═══

Indicate direction of flow with an arrow



1 CPOM 6 Snag
2 SFS 7 SAV
3 CPOM 8 Snag
4 C/G 9 SFS
5 SAV 10 C/G

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	GAR 7
Date:	4/16/10
Time:	10:35
Investigator(s):	AG, JL

Latitude:	39°49'51.67"N
Longitude:	80°20'02.43"W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Precipitation in last 7 days? (Y) N

Land Use (%)	
Residential	30
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	50
Forest	20
Cropland	0
Pasture	0
Other (explain below in notes)	0
Canopy Cover (%)	35%

Substrate Type	Diameter	% Composition
Bedrock		5
Boulder	>256mm (10")	10
Cobble	64-256mm (2.5"-10")	25
Gravel	2-64mm (0.1"-2.5")	25
Sand	0.06-2mm (gritty)	20
Silt	.004-0.06mm	15
Clay	<0.004mm (slick)	0

Physiochemical Data	
Stream Width (feet)	14.0
Wetted Stream Width (feet)	12.1
Stream Depth (feet)	0.61
pH	8.15
Temperature (°C)	13.1
Conductivity (µS)	285
D.O.(mg/L)	12.87
Velocity (ft/sec.)	0.28
%CPOM	15%
%FPOM	0

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	15
2. Epifaunal Substrate (riffle quality)	14
3. Pool Substrate Characterization	12
4. Pool Variability	11
5. Channel Alteration	19
6. Sediment Deposition	12
7. Channel Sinuosity	7
8. Channel Flow Status	14
9. Condition of Banks (both banks combined)	7
10. Bank Veg. Protection (both banks combined)	8
11. Grazing/Other Disruptive Pressure	16
12. Riparian Veg. Zone Width (both banks combined)	16
Total Score (maximum=240)	151
Total / 240 x 100 = Habitat Score	63%

% Morphology Types	
Riffle	20
Pool	30
Run	50

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	11
Snag	11
CPOM	11
SAV	11
Sand/Fine Sediment	11

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- Chironomidae, Psephenidae, Odonata, Tipulidae
- Good flow
- Long Run through reach
- Algae coating the substrate

918.12 gpm

Investigator(s) Signature:

Adam Gaskione

John A. Lewis

Pebble Count

Inches		Particle	Millimeters	
	Sand	Silt/clay	0.062	
		Very Fine	0.062 - 0.13	
		Fine	0.13 - 0.25	
		Medium	.25 - .50	
		Coarse	.50 - 1.0	
.04 - .08		Very Coarse	1.0 - 2.0	
0.8 - .16	Gravel	Very Fine	2.0 - 4.0	
.16 - .22		Fine	4.0 - 6.0	
.22 - .31		Fine	6.0 - 8.0	
.31 - .44		Medium	8.0 - 11.0	
.44 - .63		Medium	11.0 - 16.0	
.63 - .89		Coarse	16 - 22	
.89-1.3		Coarse	22 - 32	
1.3 - 1.8		Very Coarse	32 - 45	
1.8 - 2.5		Very Coarse	45 - 64	
2.5 - 3.5	Cobble	Small	64 - 90	
3.5 - 5.0		Small	90 - 128	
5.0 - 7.1		Large	128 - 180	
7.1 - 10.1		Large	180 - 256	
10.1 - 14.3	Boulder	Small	256 - 362	
14.3 - 20		Small	362 - 512	
20 - 40		Medium	512 - 1024	
40 - 80		Large-Vry Large	1024 - 2048	
		Bedrock		

29

Sample Name: GAR 7 (Rd. 1) 100

Investigator Signature Adam Heathcote

Investigator Signature John A. Lewis

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Garner Run 40643

Stream NHD #: 05020005000195

Sample Date: 4/16/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): A. Greathouse, J. Lewis

Comments: GAR 7

Starting Lat/Long: 39° 49' 52.751" N / 80° 19' 58.672" W
Ending Lat/Long: 39° 49' 50.948" N / 80° 20' 52.139" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	2
Snag	2
Coarse Particulate Organic Matter	2
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Heptageniidae		*Epeorus*	U	SC	0		1						
Ephemeroptera		Ephemerellidae		*Eurylophella*	U	SC	4		2						
Ephemeroptera		Ephemeridae		*Ephemera*	U	CG	2		1						
Plecoptera		Perlodidae		*Isoperla*	U	PR	2		5						
Trichoptera		Limnephilidae		*Pycnopsyche*	U	SH	4		1						
Trichoptera		Limnephilidae		*Ironoquia*	U	SH	3		1						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		2						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		3						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		1						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		2						
Diptera		Chironomidae	M			CG	6	183							
Diptera		Ceratopogonidae		*Probezzia*	M	PR	6		2						
Diptera		Simuliidae		*Simulium*	*	FC	6		5						
Diptera		Simuliidae		*Prosimulium*	*	FC	2		8						
Diptera		Tipulidae		*Tipula*	*	SH	4		1						
Diptera		Tipulidae		*Hexatoma*	*	PR	2		1						
Diptera		Empididae	*			PR	6	2							
Gastropoda		Physidae	U			SC	8	1							
				Total Number of Individuals:				186	36	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America (*Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	2/8/11
Time:	2:00 PM
Investigator:	SG MB

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	VAR 7

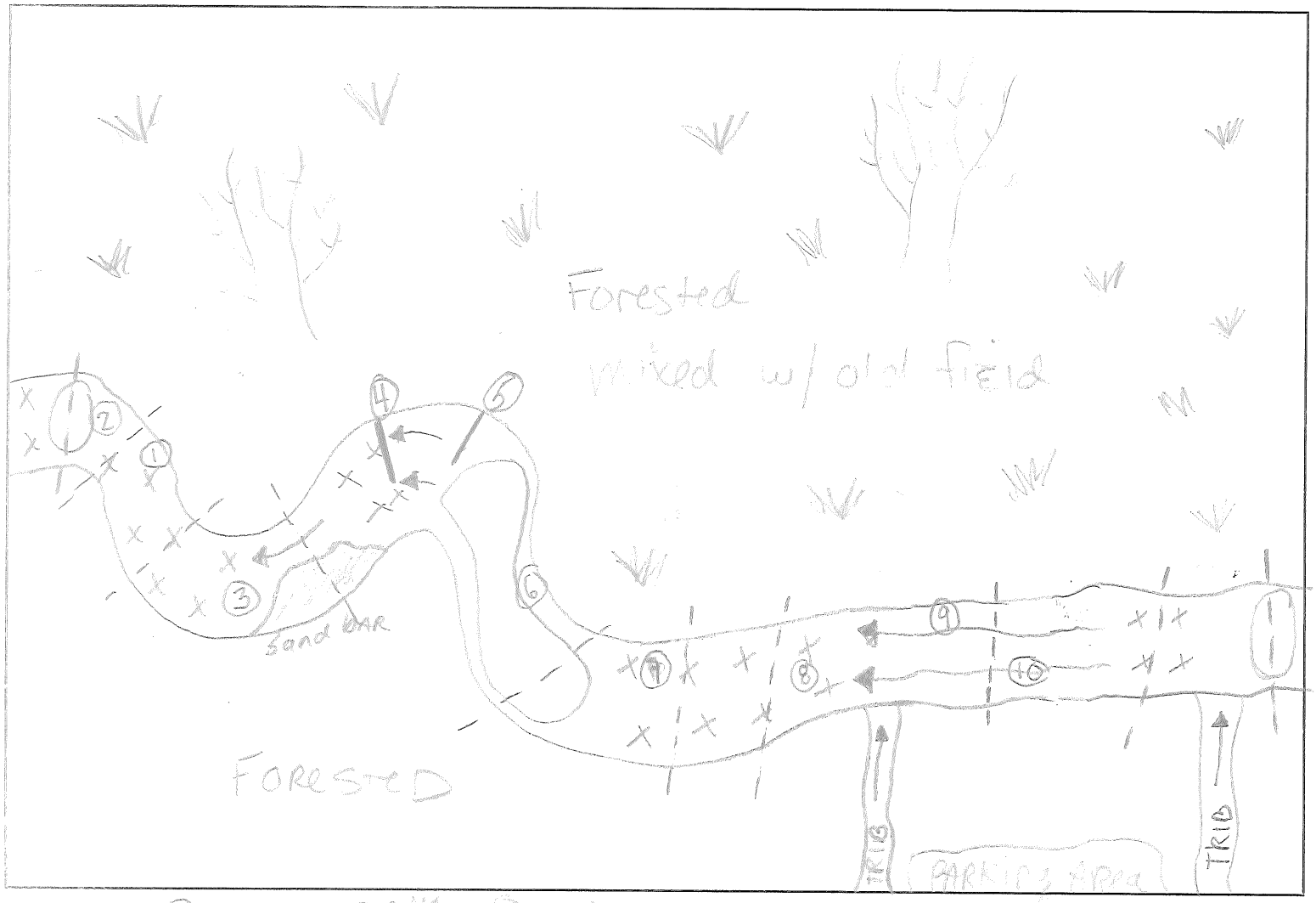
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 SAV
2 SFS
3 CPOM
4 SNAG
5 SNAG
6 SAV
7 CIG
8 CIG
9 CPOM
10 SFS

WPI
WALLACE & PANCHER, INC.

Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	JAR 7
Date:	2/8/11
Time:	2:00 PM
Investigator(s):	SG MB

Latitude:	39° 49' 52.04" N
Longitude:	80° 20' 01.33" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	Ø
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Old Fields/Old Pasture	40
Forest	60
Cropland	Ø
Pasture	Ø
Other (explain below in notes)	Ø
Canopy Cover (%)	50%

Substrate Type	Diameter	% Composition
Bedrock		Ø
Boulder	>256mm (10")	Ø
Cobble	64-256mm (2.5"-10")	20
Gravel	2-64mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	30
Silt	.004-0.06mm	20
Clay	<0.004mm (slick)	Ø

Physiochemical Data	
Stream Width (feet)	16.7
Wetted Stream Width (feet)	16.7
Stream Depth (feet)	0.18
pH	8.00
Temperature (°C)	2.5
Conductivity (µS)	210
D.O.(mg/L)	14.02
Velocity (ft/sec.)	1.64
%CPOM	15%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	18
2. Epifaunal Substrate (riffle quality)	17
3. Pool Substrate Characterization	10
4. Pool Variability	10
5. Channel Alteration	18
6. Sediment Deposition	12
7. Channel Sinuosity	10
8. Channel Flow Status	16
9. Condition of Banks (both banks combined)	7
10. Bank Veg. Protection (both banks combined)	14
11. Grazing/Other Disruptive Pressure	15
12. Riparian Veg. Zone Width (both banks combined)	16
Total Score (maximum=240)	163
Total / 240 x 100 = Habitat Score	68%

% Morphology Types	
Riffle	35
Pool	30
Run	35

Habitat Sampled[1]		Number of kicks
Cobble/Gravel	//	2
Snag	//	2
CPOM	//	2
SAV	//	2
Sand/Fine Sediment	//	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- Site very sinuous in lower half creating pools along meanders
- RB Forested mature w/ old field
- LB Forested w/ Golden Oaks Rd ~ 20m on other side - trees
- macros obs. Chironomidae.
- Bridge just upstream Scour reach for ATV trail

Flow = 2102.03 gpm

D	V
.10	.85
.20	1.21
.18	2.42
.23	3.08
.18	1.56
.10	.97
.13	1.30
.24	1.31
.30	1.08

[1]Investigator(s) Signature:

Revised 6/09

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation Rd. #2

Stream Name: SARVER RUN

Stream ID#: 401643

Segment ID:

Station ID: GAR 7

Sample Date: 2/8/11

Sampler(s): SG MB

[X] Pre-Mining

[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run	Pool/Glide	
Fines	Silt/Clay	<0.062	//	~~IIII~~ ///	10
Sand	Very Fine	0.062 - 0.125	//	~~IIII~~	7
	Fine	0.125 - 0.25		////	4
	Medium	0.25 - 0.50	//	~~IIII~~	8
	Coarse	0.5 - 1.00	/	///	4
	Very Coarse	1.00 - 2.00	//	///	7
Gravel	Very Fine	2.00 - 4.00	~~IIII~~		14
	Fine	4.00 - 5.70	////		4
	Fine	5.70 - 8.00	///		3
	Medium	8.00 - 11.3	///		3
	Medium	11.3 - 16.0	////		4
	Coarse	16.0 - 22.6	//		2
	Coarse	22.6 - 32.0	~~IIII~~		5
	Very Coarse	32.0 - 45.0	~~IIII~~ //		7
	Very Coarse	45.0 - 64.0	~~IIII~~ //		7
Cobble	Small	64.0 - 90.0	~~IIII~~ ///		8
	Small	90.0 - 128	~~IIII~~ /		5
	Large	128 - 180	~~IIII~~ /		6
	Large	180 - 256	//		2
Boulder	Small	256 - 362			0
	Small	362 - 512			0
	Medium	512 - 1,024	/		1
	Large	1,024 - 2,048			0
Bedrock	Large	>2,048	/		1
		Totals:	70	30	100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Garner Run 40643

Stream NHD #: 05020005000195

Sample Date: 2/8/2011

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S. Gill / M. Benson

Comments: GAR 7

Starting Lat/Long: 39° 49' 52.751" N / 80° 19' 58.672" W
Ending Lat/Long: 39° 49' 50.948" N / 80° 20' 2.139" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats	
	Number of Jabs
Cobble/Gravel Substrate	2
Snag	2
Coarse Particulate Organic Matter	2
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1- 7		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Leptophlebiidae		*Leptophlebia*	U	CG	4		1						
Trichoptera		Phryganeidae		*Ptilostomis*	U	SH	5		1						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		2						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		1						
Diptera		Chironomidae	M			CG	6	164							
Diptera		Ceratopogonidae	M			PR	6	2							
Diptera		Tipulidae		*Pilaria*	*	PR	7		1						
Diptera		Tipulidae		*Tipula*	*	SH	4		2						
Diptera		Psychodidae		*Pericoma*	*	CG	4		1						
Bivalvia		Sphaeriidae	U			FC	8	1							
Gastropoda		Lymnaeidae	U			SC	7	1							
Annelida		Oligochaeta	*			CG	10	3							
				Total Number of Individuals:				171	9	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	4/12/10
Time:	9:00 AM
Investigator:	SG BW

Project Name/Area:	Foundation (Rd. #1)
Sample Identifier:	GRR 3

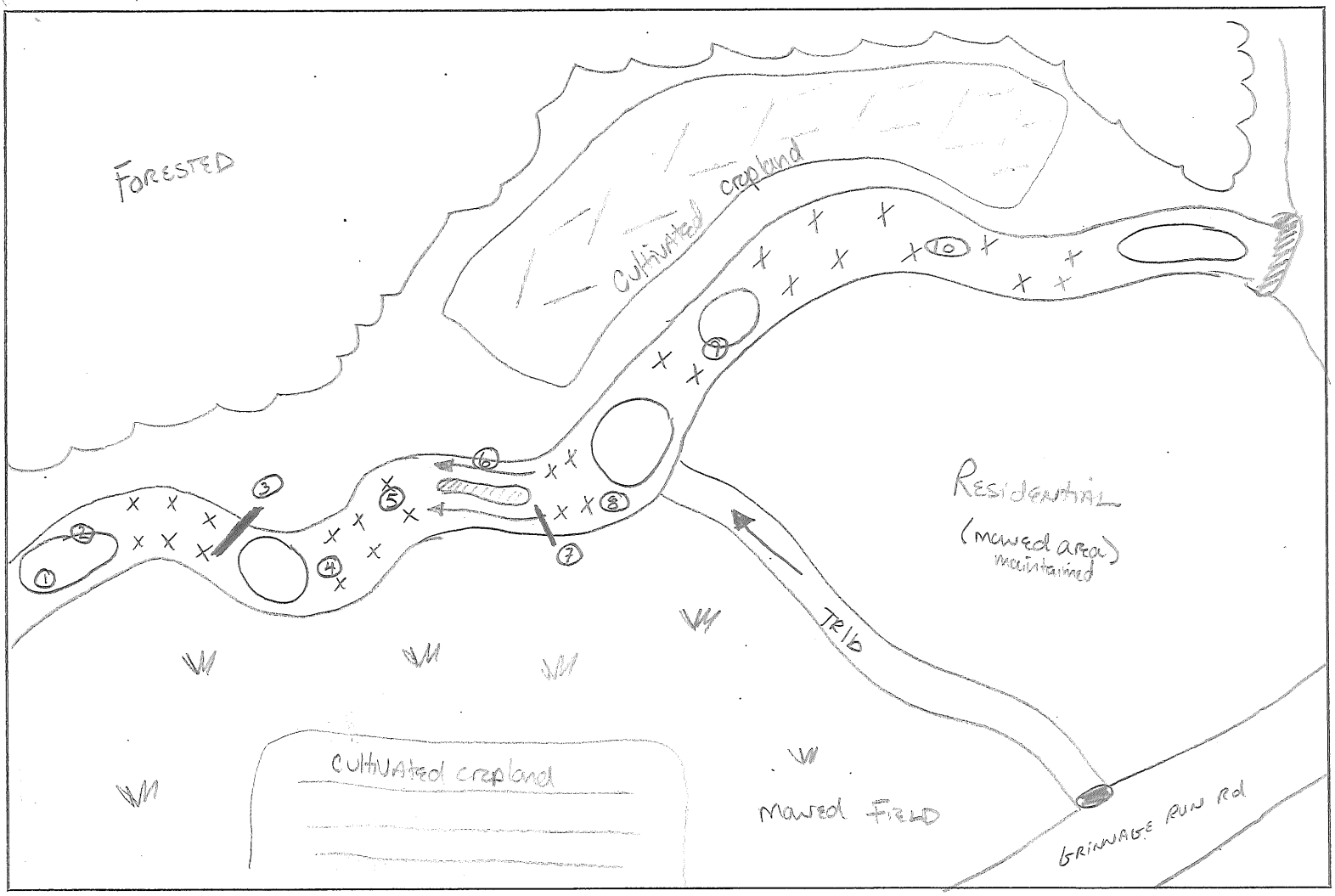
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 CPOM	6 SAV
2 SFS	7 SNAG
3 SNAG	8 SFS
4 SAV	9 CPOM
5 C/G	10 C/G

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Farmington (Pd. #1)
Sample Identifier:	GRR 3
Date:	4/12/10
Time:	9:00AM
Investigator(s):	SG RW

Latitude:	39° 49' 52.10" N
Longitude:	80° 19' 02.27" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary: [ ]

Mainstem: [X]

Precipitation in last 7 days? (Y) N

Land Use (%)	
Residential	15
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Old Fields/Old Pasture	Ø
Forest	40
Cropland	25
Pasture	Ø
Other (explain below in notes)	20
Canopy Cover (%)	10%

Substrate Type	Diameter	% Composition
Bedrock		Ø
Boulder	>256mm (10")	Ø
Cobble	64-256mm (2.5"-10")	15
Gravel	2-64mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	30
Silt	.004-0.06mm	20
Clay	<0.004mm (slick)	Ø

Physiochemical Data	
Stream Width (feet)	5.0
Wetted Stream Width (feet)	3.6
Stream Depth (feet)	0.21
pH	7.55
Temperature (°C)	7.6
Conductivity (µS)	156.0
D.O.(mg/L)	16.03
Velocity (ft/sec.)	0.38
%CPOM	10%
%FPOM	5%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	13
2. Epifaunal Substrate (riffle quality)	16
3. Pool Substrate Characterization	13
4. Pool Variability	11
5. Channel Alteration	19
6. Sediment Deposition	10
7. Channel Sinuosity	9
8. Channel Flow Status	18
9. Condition of Banks (both banks combined)	8
10. Bank Veg. Protection (both banks combined)	12
11. Grazing/Other Disruptive Pressure	12
12. Riparian Veg. Zone Width (both banks combined)	6
Total Score (maximum=240)	147
Total / 240 x 100 = Habitat Score	61%

% Morphology Types	
Riffle	50
Pool	40
Run	10

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	11
Snag	11
CPOM	11
SAV	11
Sand/Fine Sediment	11

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

macros obs: perlodidae, tipulidae, phryganeidae, Ansiopteria

- other land use: mowed field
- trib entering from RB from motor road
- sewage smell present @ site
- cultivated ground on both sides of stream
- fish obs. (creek chub)
- sedimentation in deep pools pres., sand bars pres.
- salamders obs.

D	V
.06	.37
.22	.57
.35	.48
.21	.08

Flow = 127.24 gpm

Investigator(s) Signature:

Revised 6/09

Pebble Count

Inches		Particle	Millimeters	
	Sand	Silt/clay	0.062	卌 卌 卌 III
		Very Fine	0.062 - 0.13	卌 III
		Fine	0.13 - 0.25	IIII
		Medium	.25 - .50	卌 II
		Coarse	.50 - 1.0	II
.04 - .08		Very Coarse	1.0 - 2.0	IIII
0.8 - .16	Gravel	Very Fine	2.0 - 4.0	卌 I
.16 - .22		Fine	4.0 - 6.0	卌 III
.22 - .31		Fine	6.0 - 8.0	II
.31 - .44		Medium	8.0 - 11.0	卌
.44 - .63		Medium	11.0 - 16.0	卌 卌
.63 - .89		Coarse	16 - 22	卌 卌
.89-1.3		Coarse	22 - 32	卌 III
1.3 - 1.8		Very Coarse	32 - 45	III
1.8 - 2.5		Very Coarse	45 - 64	II
2.5 - 3.5	Cobble	Small	64 - 90	I
3.5 - 5.0		Small	90 - 128	I
5.0 - 7.1		Large	128 - 180	
7.1 - 10.1		Large	180 - 256	
10.1 - 14.3	Boulder	Small	256 - 362	
14.3 - 20		Small	362 - 512	
20 - 40		Medium	512 - 1024	
40 - 80		Large-Vry Large	1024 - 2048	
		Bedrock		

卌
IIII

Sample Name: GRR 3

Investigator Signature

Investigator Signature

5600-PM-MR0324 Rev. 9/2008

FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Grinage Run 40647

Stream NHD #: 05020005001424

Sample Date: 4/12/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S. Gill, B. Watson

Comments: GRR 3

Starting Lat/Long: 39° 49' 54.021" N / 80° 19' 0.825" W
Ending Lat/Long: 39° 49' 51.017" N / 80° 19' 2.279" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats	
	Number of Jabs
Cobble/Gravel Substrate	2
Snag	2
Coarse Particulate Organic Matter	2
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-8		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Ameletidae		*Ameletus*	U	CG	0		12						
Plecoptera		Perlodidae		*Isoperla*	U	PR	2		8						
Plecoptera		Perlodidae		*Diploperla*	U	PR	2		8						
Plecoptera		Chloroperlidae		*Sweltsa*	U	PR	0		1						
Plecoptera		Nemouridae	U			SH	2	1							
Plecoptera		Nemouridae		*Amphinemura*	U	SH	3		4						
Plecoptera		Nemouridae		*Ostrocerca*	U	SH	2		3						
Plecoptera		Leuctridae		*Leuctra*	U	SH	0		1						
Trichoptera		Limnephilidae		*Pycnopsyche*	U	SH	4		3						
Trichoptera		Rhyacophilidae		*Rhyacophila*	U	PR	1		9						
Trichoptera		Uenoidae		*Neophylax*	U	SC	3		2						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		1						
Coleoptera		Psephenidae		*Ectopria*	U	SC	5		2						
Diptera		Chironomidae	M			CG	6	79							
Diptera		Ceratopogonidae	M			PR	6	3							
Diptera		Ceratopogonidae		*Probezzia*	M	PR	6		4						
Diptera		Ceratopogonidae		*Ceratopogon*	M	PR	6		5						
Diptera		Simuliidae		*Simulium*	*	FC	6		3						
Diptera		Simuliidae		*Prosimulium*	*	FC	2		7						
Diptera		Tipulidae		*Pilaria*	*	PR	7		1						
Diptera		Tipulidae		*Tipula*	*	SH	4		17						
Diptera		Tipulidae		*Pseudolimnophila*	*	PR	2		11						
Diptera		Tipulidae		*Erioptera*	*	CG	7		1						
Diptera		Tabanidae		*Chrysops*	*	PI	7		3						
Diptera		Stratiomyidae	*			CG	8	1							
Bivalvia		Sphaeriidae	U			FC	8	2							
Gastropoda		Physidae	U			SC	8	3							
Gastropoda		Lymnaeidae	U			SC	7	1							
Decapoda		Cambaridae		*Cambarus*	*	CG	6		1						
Annelida		Oligochaeta	*			CG	10	1							
Odonata		Aeshnidae		*Boyeria*	U	PR	2		1						
Odonata		Aeshnidae		*Aeshna*	U	PR	5		1						
				Total Number of Individuals:				91	109	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America (*Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	11-16-10
Time:	12:50 PM
Investigator:	GM AG CT

Project Name/Area:	Foundation Rd. 2
Sample Identifier:	GRR 3

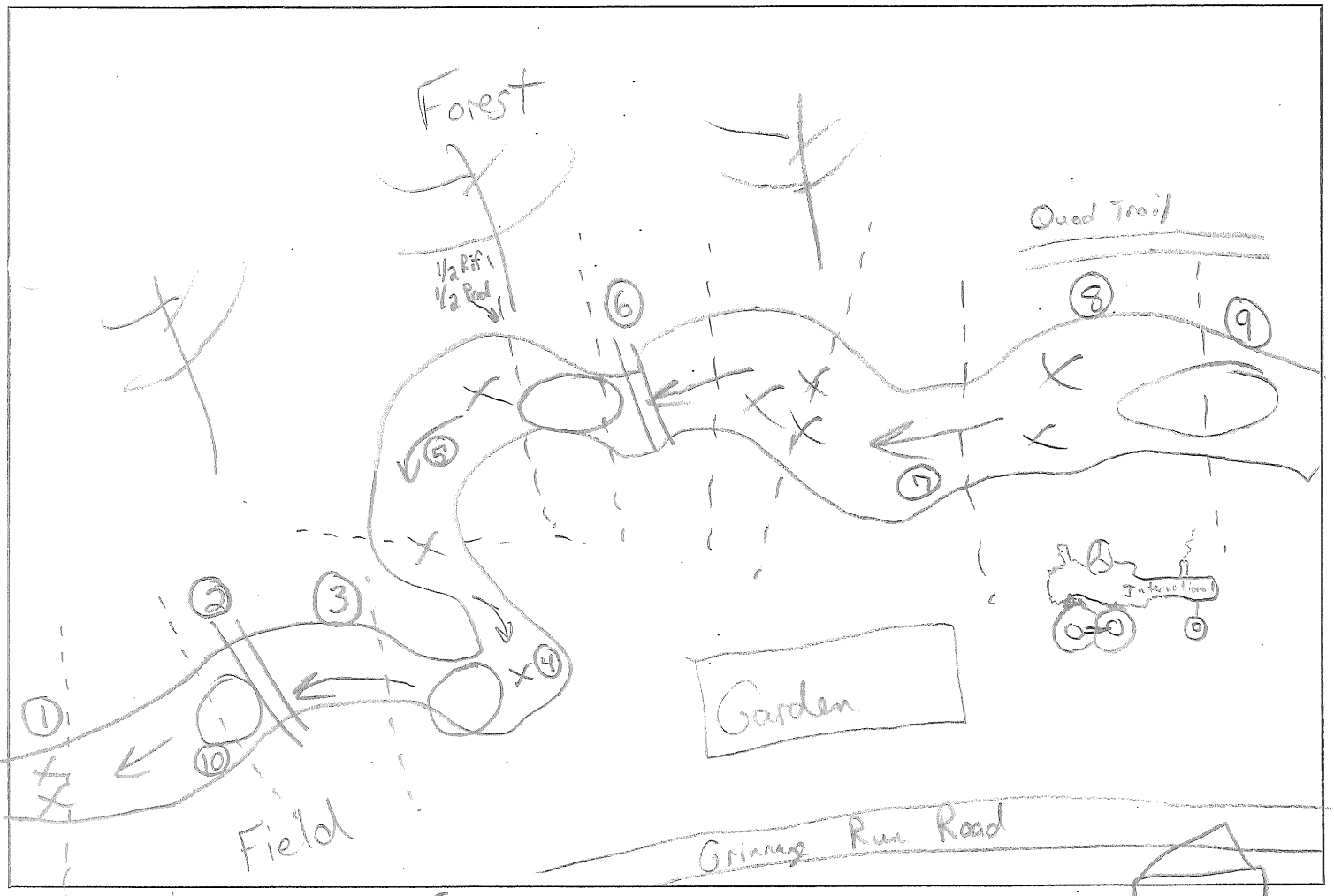
Investigator Signature: Gregory M. Moore

Investigator Signature: Adam Gleitsmann

LEGEND

Riffle = X
Pool = 0
Run = ⟶
Snag = ═══

Indicate direction of flow with an arrow



1 Cobble/Gravel
2 Snag
3 SAV
4 C/G
5 CPOM
6 Snag
7 SFS
8 SAV
9 SFS
10 CPOM

Pebble Count =

WPI
WALLACE & PANCHER, INC.

Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd. 2
Sample Identifier:	GRR 3
Date:	11-16-10
Time:	12:50 PM
Investigator(s):	GM AG CI

Latitude:	39° 49' 51.79" N
Longitude:	80° 19' 02.60" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	20
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	30
Forest	50
Cropland	0
Pasture	0
Other (explain below in notes)	0
Canopy Cover (%)	30

Substrate Type	Diameter	% Composition
Bedrock		0
Boulder	>256mm (10")	0
Cobble	64-256mm (2.5"-10")	15
Gravel	2-64mm (0.1"-2.5")	40
Sand	0.06-2mm (gritty)	15
Silt	.004-0.06mm	10
Clay	<0.004mm (slick)	20

Physiochemical Data	
Stream Width (feet)	5.0
Wetted Stream Width (feet)	2.8
Stream Depth (feet)	0.15
pH	6.8
Temperature (°C)	7.4
Conductivity (µS)	207
D.O.(mg/L)	8.9
Velocity (ft/sec.)	0.19
%CPOM	20%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	12
2. Epifaunal Substrate (riffle quality)	13
3. Pool Substrate Characterization	11
4. Pool Variability	9
5. Channel Alteration	16
6. Sediment Deposition	14
7. Channel Sinuosity	7
8. Channel Flow Status	13
9. Condition of Banks (both banks combined)	7
10. Bank Veg. Protection (both banks combined)	15
11. Grazing/Other Disruptive Pressure	12
12. Riparian Veg. Zone Width (both banks combined)	11
Total Score (maximum=240)	140
Total / 240 x 100 = Habitat Score	58%

% Morphology Types	
Riffle	35
Pool	35
Run	30

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	11
Snag	11
CPOM	11
SAV	11
Sand/Fine Sediment	11

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

Some Macros Obs.
Water Had Brown Tint in Lower Reach
Clay Bottom in Pool & Run Areas
New Fall Leaf Litter Throughout Reach

GPM = 35.19

Investigator(s) Signature:

Gregory M. Moore
Adam Shenthour

Revised 6/09

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation Rd. 2

Stream Name: Grinnage Run

Stream ID#: 40647

Segment ID:

Station ID: GRR 3

Sample Date: 11-16-10

Sampler(s): GM AG CJ

[X] Pre-Mining

[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			35 Riffle/Run 30	35 Pool/Glide	
Fines	Silt/Clay	<0.062	~~IIII~~ ~~IIII~~ ~~IIII~~ I	~~IIII~~ ~~IIII~~ III	29
Sand	Very Fine	0.062 - 0.125		II	2
	Fine	0.125 - 0.25	I	II	3
	Medium	0.25 - 0.50	I	II	3
	Coarse	0.5 - 1.00	I	II	3
	Very Coarse	1.00 - 2.00	I	III	4
Gravel	Very Fine	2.00 - 4.00	II	III	5
	Fine	4.00 - 5.70	III	II	5
	Fine	5.70 - 8.00	III	II	5
	Medium	8.00 - 11.3	III	II	5
	Medium	11.3 - 16.0	III		3
	Coarse	16.0 - 22.6		I	1
	Coarse	22.6 - 32.0	IIII		4
	Very Coarse	32.0 - 45.0	IIII		4
	Very Coarse	45.0 - 64.0	~~IIII~~ IIII		9
Cobble	Small	64.0 - 90.0	IIII		4
	Small	90.0 - 128	~~IIII~~ I	I	7
	Large	128 - 180	II		2
	Large	180 - 256	II		2
Boulder	Small	256 - 362			0
	Small	362 - 512			0
	Medium	512 - 1,024			0
	Large	1,024 - 2,048			0
Bedrock	Large	>2,048			0
		Totals:	65	35	100

FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Grinage Run 40647

Stream NHD #: 05020005001424

Sample Date: 11/16/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): G. Moore / A. Greathouse / C. Incorvia

Comments: GRR 3

Starting Lat/Long: 39° 49' 54.021" N / 80° 19' 0.825" W
Ending Lat/Long: 39° 49' 51.017" N / 80° 19' 2.279" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	2
Snag	2
Coarse Particulate Organic Matter	2
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1- 10		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Plecoptera		Capniidae	U			SH	3	14							
Plecoptera		Capniidae		*Allocapnia*	U	SH	3		40						
Plecoptera		Taeniopterygidae		*Taeniopteryx*	U	SH	2		1						
Plecoptera		Leuctridae		*Leuctra*	U	SH	0		11						
Trichoptera		Phryganeidae		*Ptilostomis*	U	SH	5		14						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		1						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		1						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		2						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		2						
Diptera		Chironomidae	M			CG	6	70							
Diptera		Tipulidae		*Tipula*	*	SH	4		10						
Diptera		Tipulidae		*Dicranota*	*	PR	3		2						
Diptera		Tipulidae		*Hexatoma*	*	PR	2		1						
Diptera		Tipulidae		*Pseudolimnophila*	*	PR	2		1						
Diptera		Tabanidae		*Chrysops*	*	PI	7		2						
Megaloptera		Sialidae		*Sialis*	U	PR	6		2						
Gastropoda		Physidae	U			SC	8	3							
				Total Number of Individuals:				87	90	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

WALLACE & PANCHER, INC.

Appendix B- Stream Habitat Field Sketch Form

Date:	4/16/10
Time:	2:10
Investigator:	AG, JL

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	HOG 1

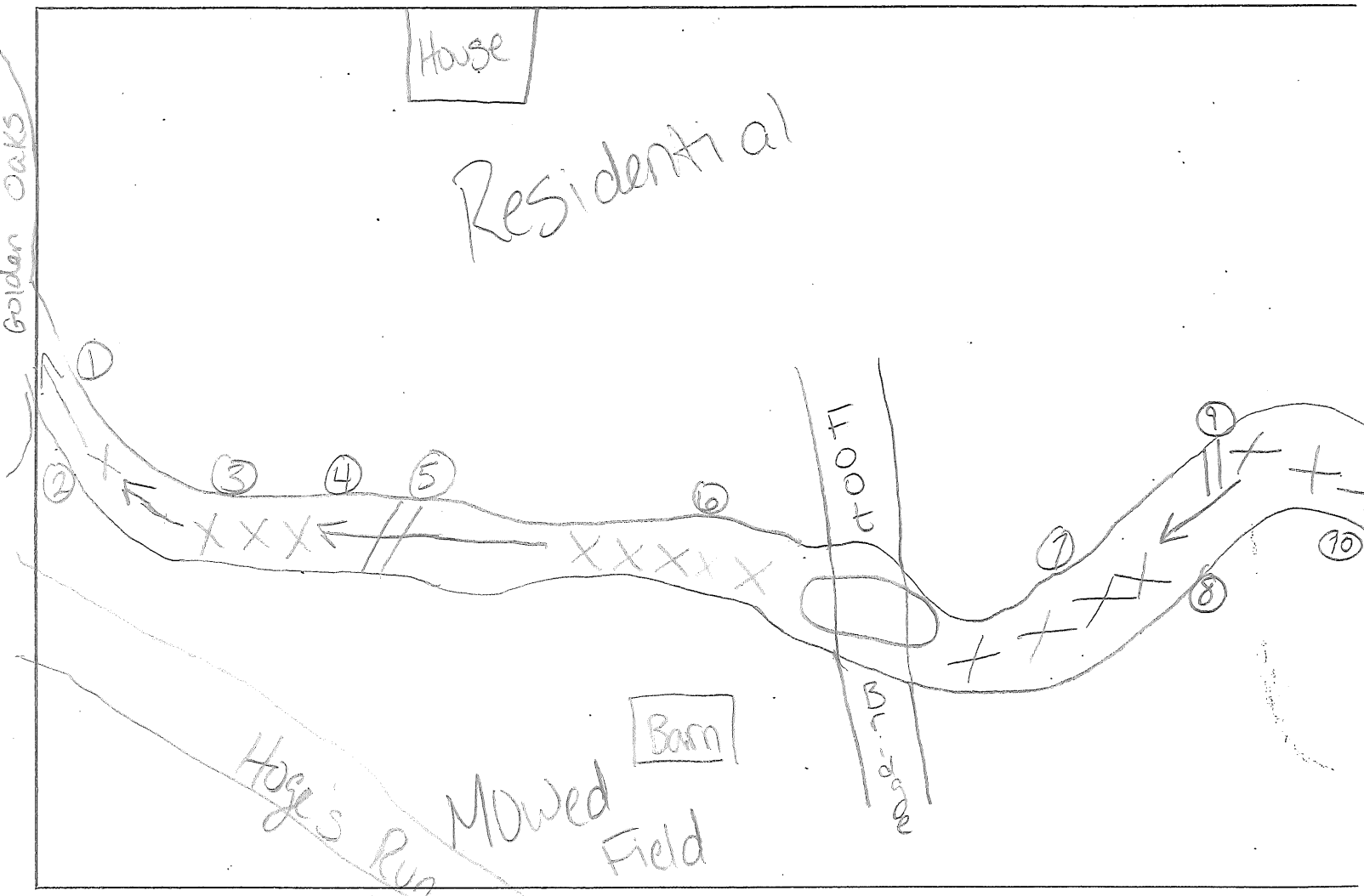
Investigator Signature: Adam Greathouse

Investigator Signature: John A. Lewis

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 SAV
2 SAV
3 c/g
4 SFS
5 Snag
6 c/g
7 c/g
8 SFS
9 snag
10 c/g

WALLACE & PANCHER, INC.

Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	HOG 1
Date:	4/16/10
Time:	2:10
Investigator(s):	AG, JL

Latitude:	39° 51' 38.79"N
Longitude:	80° 18' 40.03" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Precipitation in last 7 days? (Y) N

Land Use (%)	
Residential	60
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	0
Forest	0
Cropland	0
Pasture	0
Other (explain below in notes)	40
Canopy Cover (%)	0

Substrate Type	Diameter	% Composition
Bedrock		0
Boulder	>256mm (10")	10
Cobble	64-256mm (2.5"-10")	25
Gravel	2-64mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	20
Silt	.004-0.06mm	10
Clay	<0.004mm (slick)	0

Physiochemical Data	
Stream Width (feet)	5.3
Wetted Stream Width (feet)	4.1
Stream Depth (feet)	0.30
pH	8.71
Temperature (°C)	15.2
Conductivity (µS)	212
D.O.(mg/L)	10.74
Velocity (ft/sec.)	0.37
%CPOM	0
%FPOM	0

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	13
2. Epifaunal Substrate (riffle quality)	15
3. Pool Substrate Characterization	11
4. Pool Variability	5
5. Channel Alteration	18
6. Sediment Deposition	14
7. Channel Sinuosity	7
8. Channel Flow Status	14
9. Condition of Banks (both banks combined)	10
10. Bank Veg. Protection (both banks combined)	12
11. Grazing/Other Disruptive Pressure	7
12. Riparian Veg. Zone Width (both banks combined)	1
Total Score (maximum=240)	127
Total / 240 x 100 = Habitat Score	53 %

% Morphology Types	
Riffle	55
Pool	30
Run	15

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	||||
Snag	||
CPOM	0
SAV	||
Sand/Fine Sediment	||

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

Land Use: Mowed field

Tipulidae, Perlodidae, Cambaridae, Psephenidae Heptageniidae

Fish obs (Blacknose dace) w/ parasites

Bridge crosses stream @ midpoint, but there's no culvert

203.93 gpm

Investigator(s) Signature:

Adam Heathrone

John A. Lewis

Revised 6/09

Pebble Count

Inches		Particle	Millimeters	
	Sand	Silt/clay	0.062	
		Very Fine	0.062 - 0.13	19
		Fine	0.13 - 0.25	
		Medium	.25 - .50	
		Coarse	.50 - 1.0	
.04 - .08		Very Coarse	1.0 - 2.0	
0.8 - .16	Gravel	Very Fine	2.0 - 4.0	
.16 - .22		Fine	4.0 - 6.0	
.22 - .31		Fine	6.0 - 8.0	
.31 - .44		Medium	8.0 - 11.0	
.44 - .63		Medium	11.0 - 16.0	
.63 - .89		Coarse	16 - 22	
.89-1.3		Coarse	22 - 32	
1.3 - 1.8		Very Coarse	32 - 45	
1.8 - 2.5		Very Coarse	45 - 64	
2.5 - 3.5	Cobble	Small	64 - 90	
3.5 - 5.0		Small	90 - 128	
5.0 - 7.1		Large	128 - 180	
7.1 - 10.1		Large	180 - 256	
10.1 - 14.3	Boulder	Small	256 - 362	
14.3 - 20		Small	362 - 512	
20 - 40		Medium	512 - 1024	
40 - 80		Large-Vry Large	1024 - 2048	
		Bedrock		

Sample Name: HOG 1 (Rd. 1)

Investigator Signature Adam Martin

Investigator Signature John A. Lewis

5600-PM-MR0324 Rev. 9/2008

FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Hoge Run 40632

Stream NHD #: 05020005001417

Sample Date: 4/16/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): A. Greathouse, J. Lewis

Comments: HOG 1

Starting Lat/Long: 39° 51' 39.669" N / 80° 18' 42.135" W
Ending Lat/Long: 39° 51' 38.186" N / 80° 18' 38.451" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	4
Snag	2
Coarse Particulate Organic Matter	0
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-8		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Heptageniidae	U			SC	3	1							
Ephemeroptera		Ephemerellidae		*Eurylophella*	U	SC	4		2						
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		3						
Plecoptera		Perlodidae		*Isoperla*	U	PR	2		7						
Plecoptera		Perlodidae		*Diploperla*	U	PR	2		1						
Plecoptera		Chloroperlidae		*Sweltsa*	U	PR	0		1						
Plecoptera		Nemouridae		*Amphinemura*	U	SH	3		1						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		11						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		1						
Diptera		Chironomidae	M			CG	6	117							
Diptera		Simuliidae		*Simulium*	*	FC	6		44						
Diptera		Simuliidae		*Prosimulium*	*	FC	2		26						
Diptera		Tipulidae	*			SH	4	1							
Diptera		Tipulidae		*Tipula*	*	SH	4		3						
Diptera		Tipulidae		*Hexatoma*	*	PI	2		4						
Diptera		Tipulidae		*Pseudolimnophila*	*	PR	2		6						
Diptera		Tipulidae		*Erioptera*	*	CG	7		1						
Diptera		Tabanidae		*Chrysops*	*	PI	7		1						
Diptera		Stratiomyidae		*Stratiomys*	*	CG	5		1						
Gastropoda		Lymnaeidae	U			SC	7	4							
Decapoda		Cambaridae		*Cambarus*	*	CG	6		2						
Decapoda		Cambaridae		*Orconectes*	*	CG	6		1						
				Total Number of Individuals:				123	116	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America (*Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	2/7/11
Time:	1:30 PM
Investigator:	SG MB

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	HOG 1

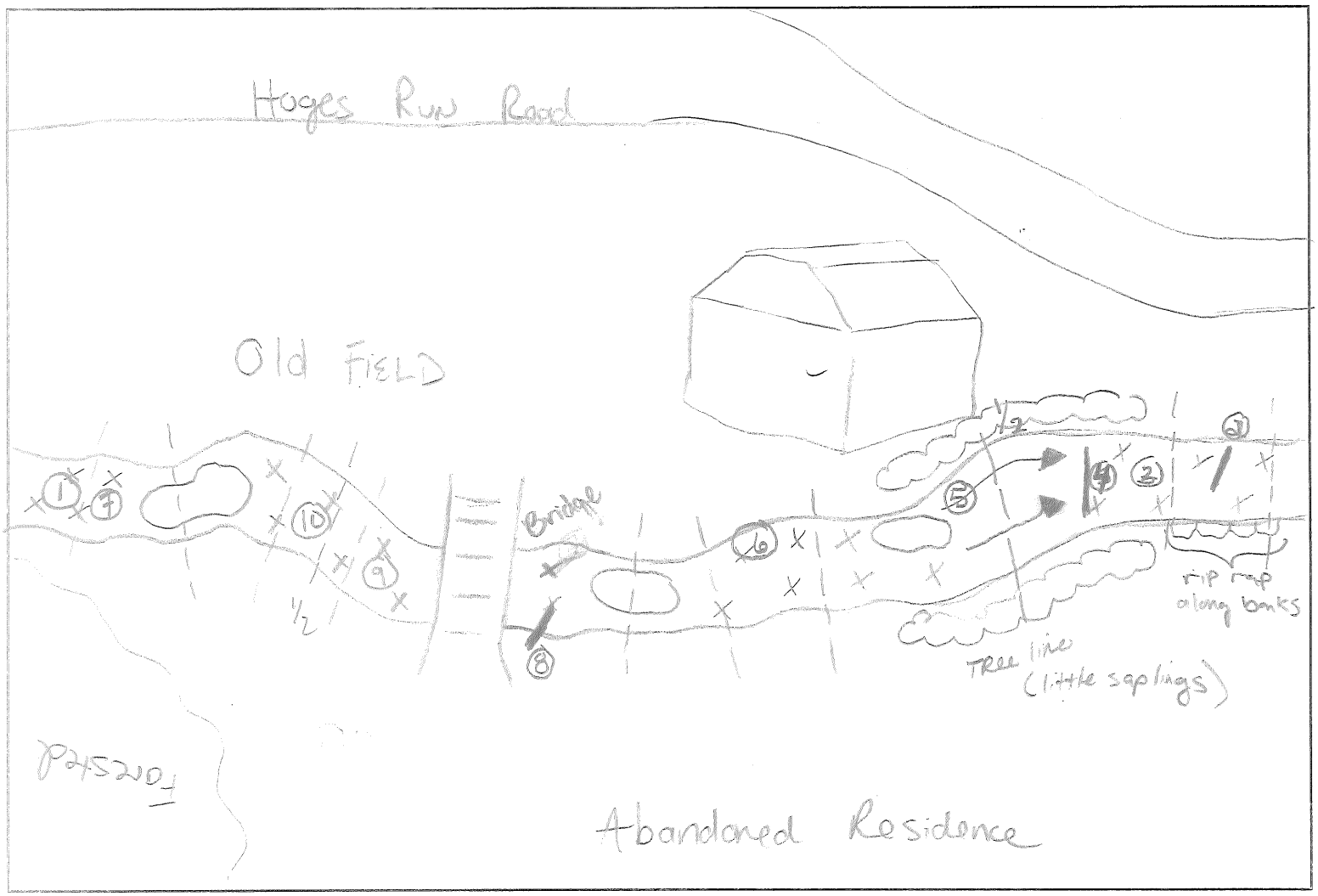
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 SAV	6 SAV
2 SNAG	7 CIG
3 CIG	8 SNAG
4 SNAG	9 CIG
5 SFS	10 CIG

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd #2
Sample Identifier:	H057
Date:	2/7/11
Time:	1:30 pm
Investigator(s):	SG MB

Latitude:	39° 51' 38.95" N
Longitude:	80° 19' 40.43" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	Ø
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Old Fields/Old Pasture	50
Forest	5
Cropland	Ø
Pasture	Ø
Other (explain below in notes)	45
Canopy Cover (%)	5%

Substrate Type	Diameter	% Composition
Bedrock		Ø
Boulder	>256mm (10")	5
Cobble	64-256mm (2.5"-10")	30
Gravel	2-64mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	15
Silt	.004-0.06mm	15
Clay	<0.004mm (slick)	Ø

Physiochemical Data	
Stream Width (feet)	6.0
Wetted Stream Width (feet)	6.0
Stream Depth (feet)	0.55
pH	8.08
Temperature (°C)	4.0
Conductivity (µS)	200
D.O.(mg/L)	13.3
Velocity (ft/sec.)	0.30
%CPOM	0%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	14
2. Epifaunal Substrate (riffle quality)	16
3. Pool Substrate Characterization	11
4. Pool Variability	7
5. Channel Alteration	15
6. Sediment Deposition	16
7. Channel Sinuosity	5
8. Channel Flow Status	16
9. Condition of Banks (both banks combined)	14
10. Bank Veg. Protection (both banks combined)	14
11. Grazing/Other Disruptive Pressure	12
12. Riparian Veg. Zone Width (both banks combined)	10
Total Score (maximum=240)	150
Total / 240 x 100 = Habitat Score	63%

% Morphology Types	
Riffle	75
Pool	20
Run	5

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	4
Snag	3
CPOM	0
SAV	2
Sand/Fine Sediment	1

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- 45% Land use = abandoned residence on RB of stream
- Fields on LB looks to mowed & maintained a few times a year

Macros obs: tipulidae

Fish obs: Johnny Darter

- Banks stable, excellent substrate, mix of C/G
- rip rap along banks in lower reach
- bridges crosses stream @ mid pt. of reach

Flow = 44.34 gpm

D	V
.47	.04
.85	.05
.79	.24
.70	.13
.15	[illegible]

Investigator(s) Signature:

Revised 6/09

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation Rd. #2
Stream Name: Hogg's Run
Stream ID#: 40632
Segment ID:
Station ID: HOG 1
Sample Date: 2/7/11
Sampler(s): SG MB

[X] Pre-Mining
[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run	Pool/Glide	
Fines	Silt/Clay	<0.062	8 ~~IIII~~ ~~IIII~~ //	~~IIII~~ /	16
Sand	Very Fine	0.062 - 0.125	/	~~IIII~~	6
	Fine	0.125 - 0.25	////	~~IIII~~	9
	Medium	0.25 - 0.50	//	////	6
	Coarse	0.5 - 1.00	~~IIII~~ /		6
	Very Coarse	1.00 - 2.00	///		3
Gravel	Very Fine	2.00 - 4.00	~~IIII~~ ~~IIII~~		10
	Fine	4.00 - 5.70	~~IIII~~		5
	Fine	5.70 - 8.00	//		2
	Medium	8.00 - 11.3	/		1
	Medium	11.3 - 16.0	////		4
	Coarse	16.0 - 22.6	///		3
	Coarse	22.6 - 32.0	////		4
	Very Coarse	32.0 - 45.0	~~IIII~~ /		6
	Very Coarse	45.0 - 64.0	~~IIII~~		5
Cobble	Small	64.0 - 90.0	~~IIII~~		5
	Small	90.0 - 128	~~IIII~~		5
	Large	128 - 180	//		2
	Large	180 - 256	//		2
Boulder	Small	256 - 362			
	Small	362 - 512			
	Medium	512 - 1,024			
	Large	1,024 - 2,048			
Bedrock	Large	>2,048			
		Totals:	80	20	100

5600-PM-MR0324 Rev. 9/2008

FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Hoge Run 40632

Stream NHD #: 05020005001417

Sample Date: 2/7/2011

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S. Gill / M. Benson

Comments: HOG 1

Starting Lat/Long: 39° 51' 39.669" N / 80° 18' 42.135" W
Ending Lat/Long: 39° 51' 38.186" N / 80° 18' 38.451" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	4
Snag	3
Coarse Particulate Organic Matter	0
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	1

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1- 12		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Ameletidae		*Ameletus*	U	CG	0		1						
Ephemeroptera		Heptageniidae		*Maccaffertium*	U	SC	3		1						
Ephemeroptera		Ephemerellidae		*Eurylophella*	U	SC	4		1						
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		2						
Plecoptera		Capniidae	U			SH	3	4							
Plecoptera		Capniidae		*Allocapnia*	U	SH	3		43						
Plecoptera		Perlodidae		*Diploperla*	U	PR	2		4						
Plecoptera		Chloroperlidae		*Sweltsa*	U	PR	0		1						
Plecoptera		Nemouridae		*Prostoia*	U	SH	2		10						
Plecoptera		Leuctridae		*Leuctra*	U	SH	0		5						
Trichoptera		Phryganeidae		*Ptilostomis*	U	SH	5		2						
Trichoptera		Limnephilidae	U			SH	4	2							
Trichoptera		Limnephilidae		*Pycnopsyche*	U	SH	4		1						
Trichoptera		Limnephilidae		*Ironoquia*	U	SH	3		1						
Trichoptera		Hydropsychidae		*Diplectrona*	U	FC	0		1						
Trichoptera		Rhyacophilidae		*Rhyacophila*	U	PR	1		1						
Trichoptera		Uenoidae		*Neophylax*	U	SC	3		20						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		1						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		2						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		2						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		4						
Diptera		Chironomidae	M			CG	6	42							
Diptera		Simuliidae		*Prosimulium*	*	FC	2		7						
Diptera		Tipulidae	*			SH	4	1							
Diptera		Tipulidae		*Limnophila*	*	PR	3		1						
Diptera		Tipulidae		*Tipula*	*	SH	4		8						
Diptera		Tipulidae		*Hexatoma*	*	PR	2		1						
Diptera		Tipulidae		*Pseudolimnophila*	*	PR	2		1						
Diptera		Tabanidae	*			PI	6	3							
Bivalvia		Sphaeriidae	U			FC	8	2							
Gastropoda		Physidae	U			SC	8	3							
Gastropoda		Lymnaeidae	U			SC	7	1							
Annelida		Oligochaeta	*			CG	10	1							
				Total Number of Individuals:				59	121	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	4/16/10
Time:	1:10
Investigator:	AG, JL

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	HOG 2

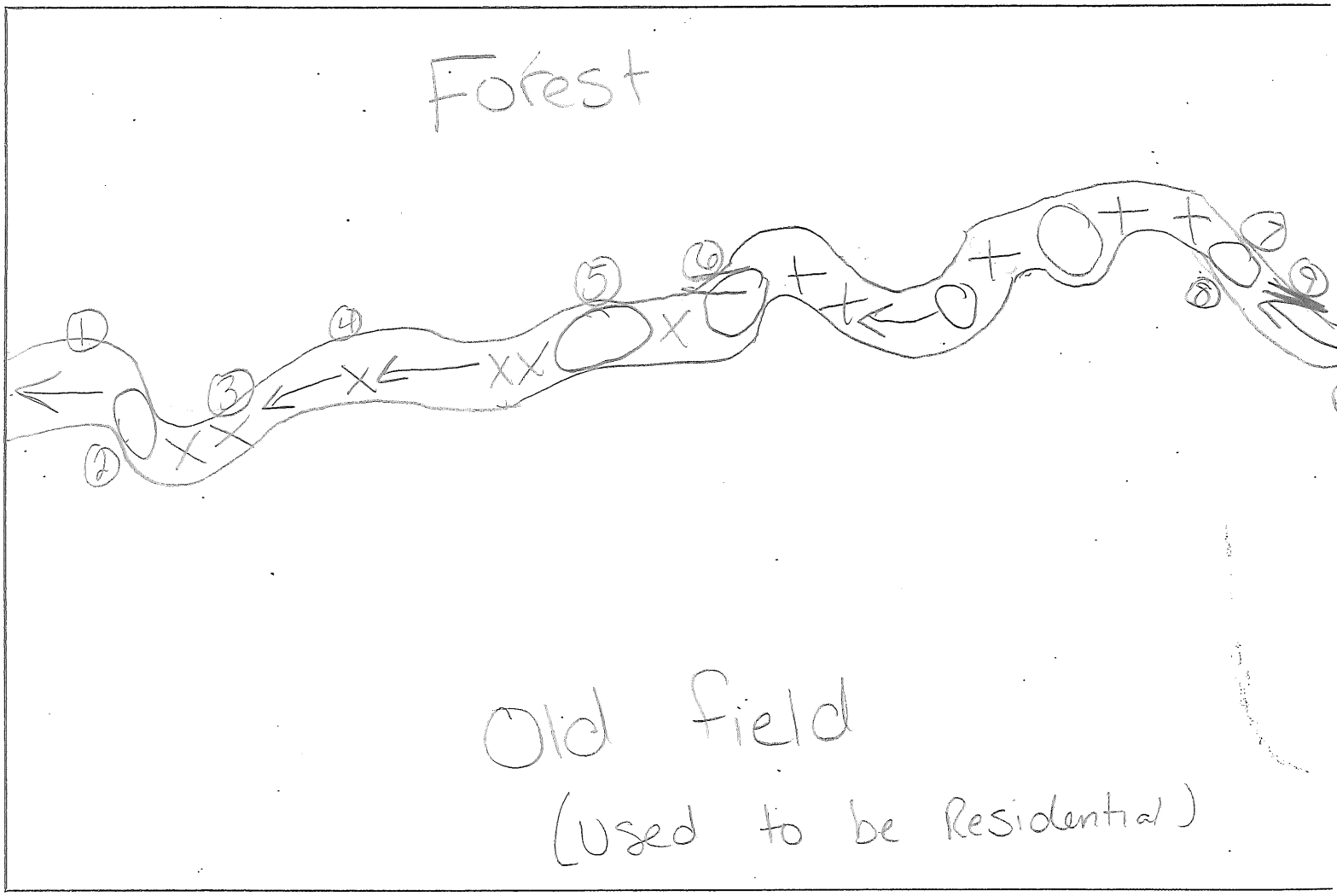
Investigator Signature: Adam [illegible]

Investigator Signature: John A. Lewis

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1	CPOM	6	Snag
2	SAV	7	SFS
3	C/g	8	SAV
4	SFS	9	Snag
5	CPOM	10	C/g

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	HOG 2
Date:	4/16/10
Time:	1:10
Investigator(s):	AG, JL

Latitude:	39° 52' 10.62" N
Longitude:	80° 19' 33.40" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Precipitation in last 7 days? (Y) N

Land Use (%)	
Residential	0
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	50
Forest	50
Cropland	0
Pasture	0
Other (explain below in notes)	0
Canopy Cover (%)	15%

Substrate Type	Diameter	% Composition
Bedrock		0
Boulder	>256mm (10")	5
Cobble	64-256mm (2.5"-10")	20
Gravel	2-64mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	25
Silt	.004-0.06mm	20
Clay	<0.004mm (slick)	0

Physiochemical Data	
Stream Width (feet)	6.3
Wetted Stream Width (feet)	4.3
Stream Depth (feet)	0.13
pH	8.58
Temperature (°C)	20.3
Conductivity (µS)	257
D.O.(mg/L)	11.41
Velocity (ft/sec.)	0.35
%CPOM	10
%FPOM	0

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	11
2. Epifaunal Substrate (riffle quality)	13
3. Pool Substrate Characterization	11
4. Pool Variability	9
5. Channel Alteration	19
6. Sediment Deposition	12
7. Channel Sinuosity	8
8. Channel Flow Status	11
9. Condition of Banks (both banks combined)	6
10. Bank Veg. Protection (both banks combined)	6
11. Grazing/Other Disruptive Pressure	14
12. Riparian Veg. Zone Width (both banks combined)	19
Total Score (maximum=240)	139
Total / 240 x 100 = Habitat Score	58%

% Morphology Types	
Riffle	40
Pool	20
Run	40

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	11
Snag	11
CPOM	11
SAV	11
Sand/Fine Sediment	11

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

Perlodidae, Cambaridae, Chironomidae, Odonata Tipulidae

LB: old field

RB: Forest.

All habitats sampled

Fish obs & Salamander obs

84.44 GPM

Investigator(s) Signature:

Adam Greathouse

John A. Lewis

Revised 6/09

Pebble Count

Inches		Particle	Millimeters	
	Sand	Silt/clay	0.062	
		Very Fine	0.062 - 0.13	
		Fine	0.13 - 0.25	
		Medium	.25 - .50	
		Coarse	.50 - 1.0	
.04 - .08		Very Coarse	1.0 - 2.0	
0.8 - .16	Gravel	Very Fine	2.0 - 4.0	
.16 - .22		Fine	4.0 - 6.0	
.22 - .31		Fine	6.0 - 8.0	
.31 - .44		Medium	8.0 - 11.0	
.44 - .63		Medium	11.0 - 16.0	
.63 - .89		Coarse	16 - 22	
.89-1.3		Coarse	22 - 32	
1.3 - 1.8		Very Coarse	32 - 45	
1.8 - 2.5		Very Coarse	45 - 64	
2.5 - 3.5	Cobble	Small	64 - 90	
3.5 - 5.0		Small	90 - 128	
5.0 - 7.1		Large	128 - 180	
7.1 - 10.1		Large	180 - 256	
10.1 - 14.3	Boulder	Small	256 - 362	
14.3 - 20		Small	362 - 512	
20 - 40		Medium	512 - 1024	
40 - 80		Large-Vry Large	1024 - 2048	
		Bedrock		

Sample Name: HOG 2 (Rd. 1) 100

Investigator Signature Adam Heathcote

Investigator Signature John A. Lewis

5600-PM-MR0324 Rev. 9/2008

FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Hoge Run 40632

Stream NHD #: 05020005001417

Sample Date: 4/16/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): A. Greathouse, J. Lewis

Comments: HOG 2

Starting Lat/Long: 39° 52' 10.902" N / 80° 19' 35.676" W
Ending Lat/Long: 39° 52' 9.861" N / 80° 19' 31.701" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	2
Snag	2
Coarse Particulate Organic Matter	2
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Ephemerellidae	U			CG	2	1							
Plecoptera		Perlodidae		*Isoperla*	U	PR	2		5						
Trichoptera		Limnephilidae		*Pycnopsyche*	U	SH	4		1						
Trichoptera		Limnephilidae		*Ironoquia*	U	SH	3		1						
Diptera		Chironomidae	M			CG	6	188							
Diptera		Ceratopogonidae		*Probezzia*	M	PR	6		3						
Diptera		Ceratopogonidae		*Ceratopogon*	M	PR	6		3						
Diptera		Simuliidae		*Simulium*	*	FC	6		3						
Diptera		Tipulidae	*			SH	4	1							
Diptera		Tipulidae		*Pseudolimnophila*	*	PR	2		4						
Diptera		Tabanidae		*Chrysops*	*	PI	7		4						
Diptera		Stratiomyidae	*			CG	8	1							
Bivalvia		Sphaeriidae	U			FC	8	1							
Decapoda		Cambaridae	*			CG	6	1							
Odonata		Libellulidae	U			PR	9	1							
				Total Number of Individuals:				194	24	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America (*Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	12-6-10
Time:	11:00 Am
Investigator:	TMBL

Project Name/Area:	Foundation RD 2
Sample Identifier:	Hog 2

Investigator Signature: Timothy M Beck

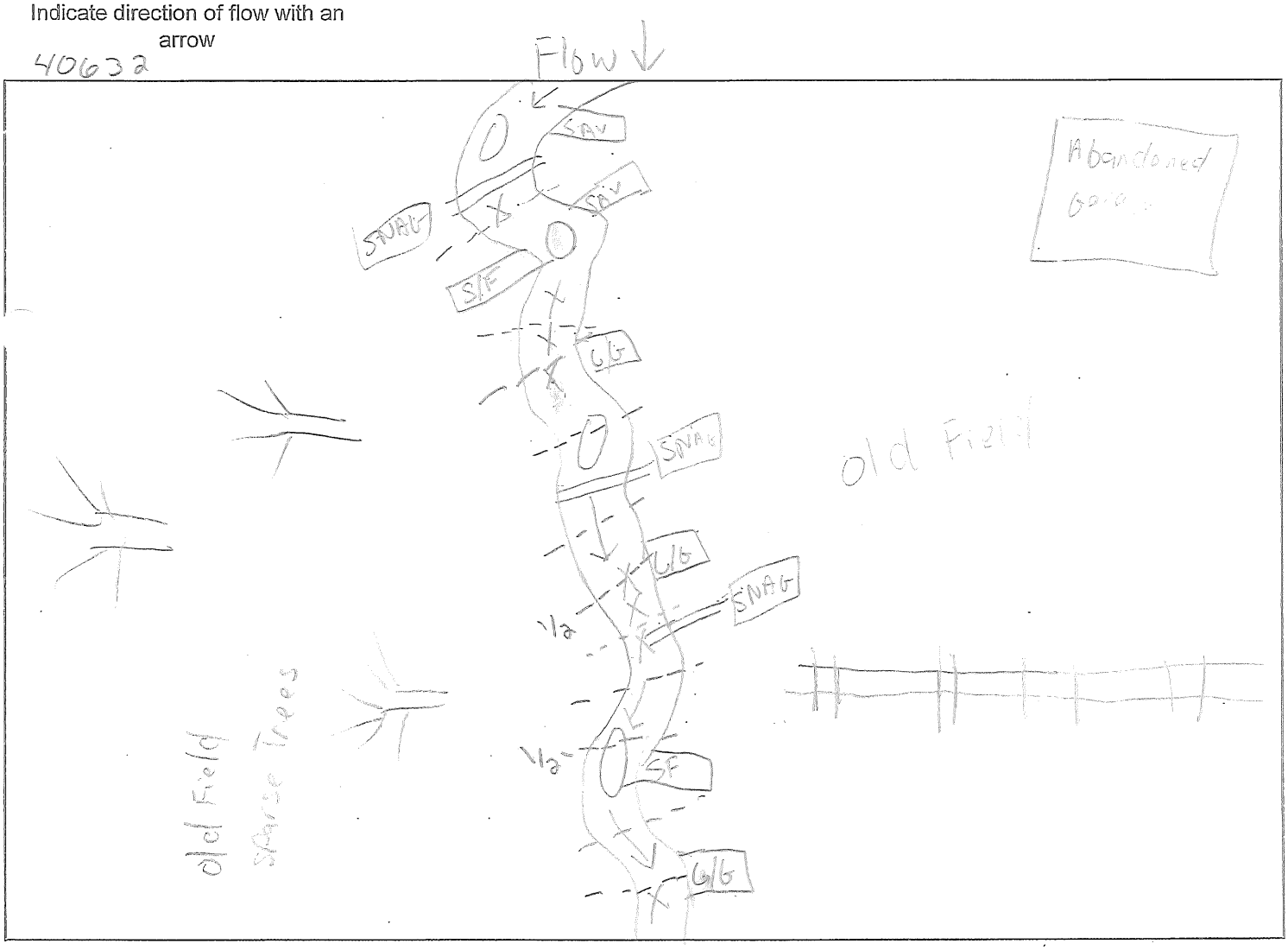
Investigator Signature: [illegible]

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow

40632



Kicks

Pebble count

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation RD 2
Sample Identifier:	Hog 2
Date:	12-6-10
Time:	11:00 AM
Investigator(s):	TM BG

Latitude:	39 52 12.513 N
Longitude:	80 19 34.040 W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary: [ ]

Mainstem: [X]

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	0
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	100
Forest	0
Cropland	0
Pasture	0
Other (explain below in notes)	0
Canopy Cover (%)	10

Substrate Type	Diameter	% Composition
Bedrock		0
Boulder	>256mm (10")	5
Cobble	64-256mm (2.5"-10")	35
Gravel	2-64mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	20
Silt	.004-0.06mm	0
Clay	<0.004mm (slick)	5

Physiochemical Data	
Stream Width (feet)	3.5
Wetted Stream Width (feet)	3.0
Stream Depth (feet)	.16
pH	7.74
Temperature (°C)	1.1
Conductivity (µS)	260
D.O.(mg/L)	13.7
Velocity (ft/sec.)	.6
%CPOM	0
%FPOM	0

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	14
2. Epifaunal Substrate (riffle quality)	15
3. Pool Substrate Characterization	10
4. Pool Variability	10
5. Channel Alteration	18
6. Sediment Deposition	14
7. Channel Sinuosity	15
8. Channel Flow Status	19
9. Condition of Banks (both banks combined)	12
10. Bank Veg. Protection (both banks combined)	16
11. Grazing/Other Disruptive Pressure	16
12. Riparian Veg. Zone Width (both banks combined)	16
Total Score (maximum=240)	177
Total / 240 x 100 = Habitat Score	74

% Morphology Types	
Riffle	70
Pool	15
Run	15

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	111
Snag	111
CPOM	—
SAV	11
Sand/Fine Sediment	11

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

Macros obs.
Tipulidae, Stonefly, Caddis

Some Trash Present Submerged
NO CPOM Recent Flood

GPM: 31.95

Investigator(s) Signature:

Timothy M Mehs

Revised 6/09

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation

Stream Name: Hoges Run

Stream ID#: 46632

Segment ID:

Station ID: Hog 2

Sample Date: 12-6-10

Sampler(s): TM BL

[X] Pre-Mining

[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run	Pool/Glide	
Fines	Silt/Clay	<0.062		~~IIII~~	5
Sand	Very Fine	0.062 - 0.125			
	Fine	0.125 - 0.25	I	III	4
	Medium	0.25 - 0.50	II	II	4
	Coarse	0.5 - 1.00	II	~~IIII~~	7
	Very Coarse	1.00 - 2.00	~~IIII~~		5
Gravel	Very Fine	2.00 - 4.00	I I		2
	Fine	4.00 - 5.70	III		3
	Fine	5.70 - 8.00	~~IIII~~		5
	Medium	8.00 - 11.3	~~IIII~~ II		7
	Medium	11.3 - 16.0	~~IIII~~ I		6
	Coarse	16.0 - 22.6	~~IIII~~		5
	Coarse	22.6 - 32.0	III		3
	Very Coarse	32.0 - 45.0	~~IIII~~		5
	Very Coarse	45.0 - 64.0	I I		2
Cobble	Small	64.0 - 90.0	~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ II		22
	Small	90.0 - 128	~~IIII~~ I		6
	Large	128 - 180	~~IIII~~ II		7
	Large	180 - 256	II		2
Boulder	Small	256 - 362			
	Small	362 - 512			
	Medium	512 - 1,024			
	Large	1,024 - 2,048			
Bedrock	Large	>2,048			
		Totals:	85	15	100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Hoge Run 40632

Stream NHD #: 05020005001417

Sample Date: 12/6/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): T. Meeks / B. Likar

Comments: HOG 2

Starting Lat/Long: 39° 52' 10.902" N / 80° 19' 35.676" W
Ending Lat/Long: 39° 52' 9.861" N / 80° 19' 31.701" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	3
Snag	3
Coarse Particulate Organic Matter	0
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1- 4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Plecoptera		Capniidae	U			SH	3	7							
Plecoptera		Capniidae		*Allocapnia*	U	SH	3		9						
Plecoptera		Perlodidae	U			PR	2	1							
Plecoptera		Perlodidae		*Diploperla*	U	PR	2		2						
Trichoptera		Limnephilidae	U			SH	4	1							
Trichoptera		Hydropsychidae		*Hydropsyche*	U	FC	5		1						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		1						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		1						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		1						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		3						
Diptera		Chironomidae	M			CG	6	140							
Diptera		Ceratopogonidae	M			PR	6	4							
Diptera		Tipulidae	*			SH	4	1							
Diptera		Tipulidae		*Tipula*	*	SH	4		2						
Diptera		Tipulidae		*Erioptera*	*	CG	7		1						
Diptera		Tabanidae	*			PI	6	1							
Diptera		Tabanidae		*Chrysops*	*	PI	7		1						
Gastropoda		Lymnaeidae	U			SC	7	2							
				Total Number of Individuals:				157	22	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	4/1.6/10
Time:	12:20
Investigator:	AG, JL

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	HOG 3

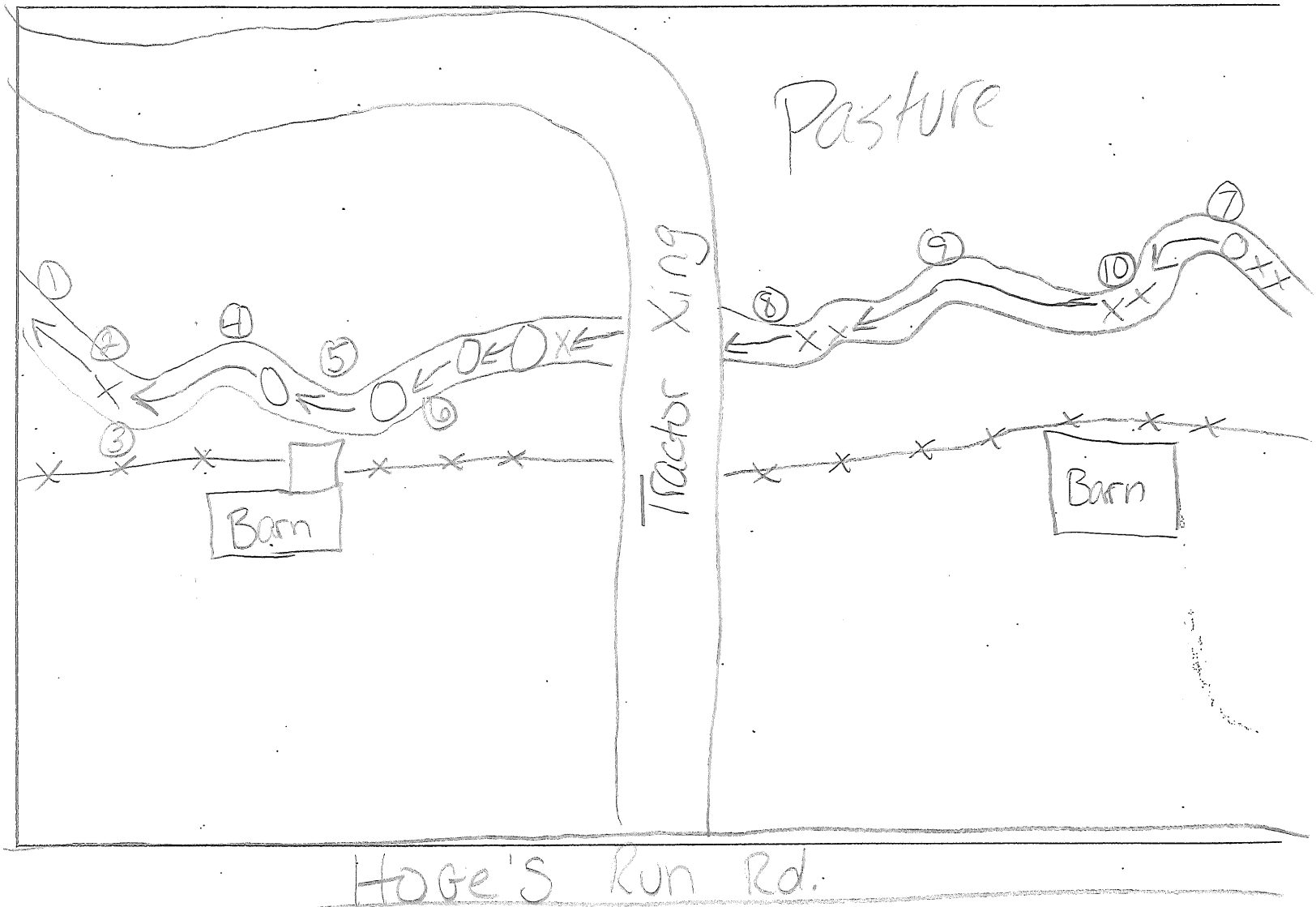
Investigator Signature: Adam Greathouse

Investigator Signature: John A. Lewis

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 SFS	6 SAV
2 SFS	7 CPOM
3 C/g	8 SFS
4 SAV	9 SAV
5 SFS	10 C/g

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	HOG 3
Date:	4/16/10
Time:	12:20
Investigator(s):	AG, JL

Latitude:	39° 52' 31.09" N
Longitude:	80° 20' 32.37" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary: ☐

Mainstem: X

Precipitation in last 7 days? (Y) N

Land Use (%)	
Residential	30
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	0
Forest	0
Cropland	0
Pasture	70
Other (explain below in notes)	0
Canopy Cover (%)	0

Substrate Type	Diameter	% Composition
Bedrock		0
Boulder	>256mm (10")	0
Cobble	64-256mm (2.5"-10")	0
Gravel	2-64mm (0.1"-2.5")	20
Sand	0.06-2mm (gritty)	35
Silt	.004-0.06mm	45
Clay	<0.004mm (slick)	0

Physiochemical Data	
Stream Width (feet)	3.5
Wetted Stream Width (feet)	2.9
Stream Depth (feet)	0.17
pH	7.95
Temperature (°C)	19.1
Conductivity (µS)	237
D.O.(mg/L)	11.11
Velocity (ft/sec.)	0.27
%CPOM	0
%FPOM	0

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	6
2. Epifaunal Substrate (riffle quality)	7
3. Pool Substrate Characterization	7
4. Pool Variability	8
5. Channel Alteration	12
6. Sediment Deposition	8
7. Channel Sinuosity	7
8. Channel Flow Status	8
9. Condition of Banks (both banks combined)	11
10. Bank Veg. Protection (both banks combined)	13
11. Grazing/Other Disruptive Pressure	7
12. Riparian Veg. Zone Width (both banks combined)	1
Total Score (maximum=240)	95
Total / 240 x 100 = Habitat Score	40%

% Morphology Types	
Riffle	15
Pool	15
Run	70

Habitat Sampled[1]		Number of kicks
Cobble/Gravel	II	2
Snag	0	0
CPOM	I	1
SAV	III	3
Sand/Fine Sediment	IIII	4

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- Odonata, Tipulidae, Leech, Ameletidae
- Fish & tadpoles obs
- Channel loses some of its definition due to cattle
- Poor substrate composition

55.68 gpm

Investigator(s) Signature:

Adam Beatrice

John A. Lewis

Pebble Count

Inches		Particle	Millimeters	
	Sand	Silt/clay	0.062	~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ IIII
		Very Fine	0.062 - 0.13	~~IIII~~ ~~IIII~~ I
		Fine	0.13 - 0.25	~~IIII~~ ~~IIII~~ II
		Medium	.25 - .50	IIII
		Coarse	.50 - 1.0	IIII
.04 - .08		Very Coarse	1.0 - 2.0	~~IIII~~ III
0.8 - .16	Gravel	Very Fine	2.0 - 4.0	II
.16 - .22		Fine	4.0 - 6.0	~~IIII~~
.22 - .31		Fine	6.0 - 8.0	III
.31 - .44		Medium	8.0 - 11.0	IIII
.44 - .63		Medium	11.0 - 16.0	~~IIII~~ I
.63 - .89		Coarse	16 - 22	~~IIII~~
.89-1.3		Coarse	22 - 32	~~IIII~~
1.3 - 1.8		Very Coarse	32 - 45	I
1.8 - 2.5		Very Coarse	45 - 64	I
2.5 - 3.5	Cobble	Small	64 - 90	
3.5 - 5.0		Small	90 - 128	
5.0 - 7.1		Large	128 - 180	
7.1 - 10.1		Large	180 - 256	
10.1 - 14.3	Boulder	Small	256 - 362	
14.3 - 20		Small	362 - 512	
20 - 40		Medium	512 - 1024	
40 - 80		Large-Vry Large	1024 - 2048	
		Bedrock		

Sample Name: HOG 3 (Rd. 1)

Investigator Signature Adam Moathan

Investigator Signature John A. Lewis

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Hoge Run 40632

Stream NHD #: 05020005001417

Sample Date: 4/16/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): A. Greathouse, J. Lewis

Comments: HOG 3

Starting Lat/Long: 39° 52' 31.944" N / 80° 20' 34.364" W
Ending Lat/Long: 39° 52' 30.379" N / 80° 20' 30.772" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats	
	Number of Jabs
Cobble/Gravel Substrate	2
Snag	0
Coarse Particulate Organic Matter	1
Submerged Aquatic Vegetation	3
Sand/Fine Sediment	4

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Ameletidae		*Ameletus*	U	CG	0		17						
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		2						
Plecoptera		Perlodidae		*Isoperla*	U	PR	2		10						
Plecoptera		Nemouridae		*Amphinemura*	U	SH	3		1						
Trichoptera		Phryganeidae	U			SH	4	1							
Trichoptera		Limnephilidae		*Ironoquia*	U	SH	3		3						
Diptera		Chironomidae	M			CG	6	159							
Diptera		Ceratopogonidae		*Probezzia*	M	PR	6		5						
Diptera		Ceratopogonidae		*Ceratopogon*	M	PR	6		8						
Diptera		Tabanidae		*Chrysops*	*	PI	7		6						
Bivalvia		Sphaeriidae	U			FC	8	7							
Gastropoda		Lymnaeidae	U			SC	7	11							
				Total Number of Individuals:				178	52	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America (*Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date: 2/7/11	
Time: 12:00 PM	
Investigator: SG MB	

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	HOLE 3

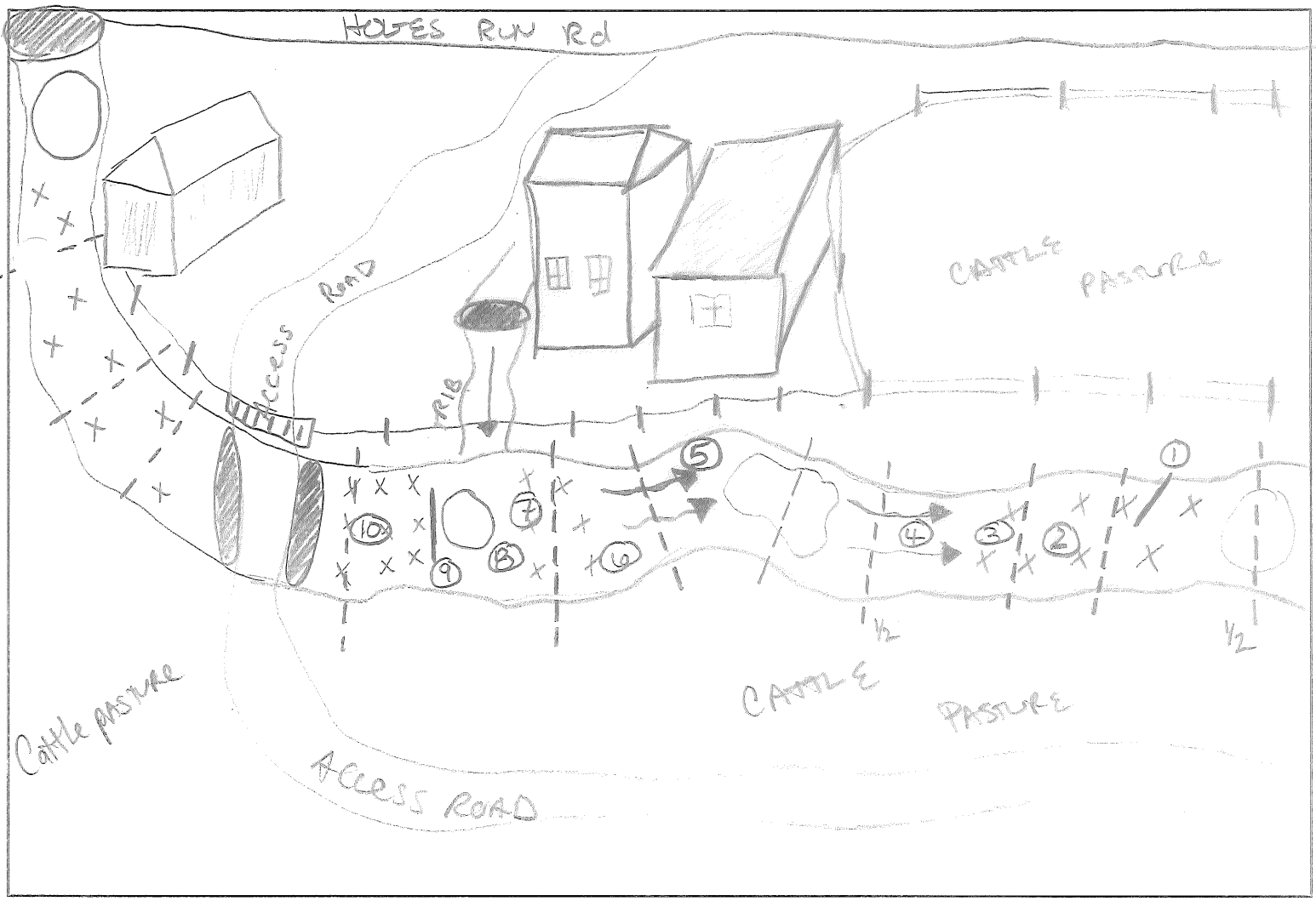
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1. SNAG
2. SAV
3. CIG
4. SFS
5. SAV
6. SFS
7. SAV
8. SFS
9. SNAG
10. CIG

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	HOG 3
Date:	2/7/11
Time:	12:00 pm
Investigator(s):	JG MB

Latitude:	39° 52' 30.90" N
Longitude:	80° 20' 31.89" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary: ☐

Mainstem: X

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	Ø
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Old Fields/Old Pasture	Ø
Forest	Ø
Cropland	Ø
Pasture	100
Other (explain below in notes)	Ø
Canopy Cover (%)	0%

Substrate Type	Diameter	% Composition
Bedrock		Ø
Boulder	>256mm (10")	Ø
Cobble	64-256mm (2.5"-10")	5
Gravel	2-64mm (0.1"-2.5")	20
Sand	0.06-2mm (gritty)	40
Silt	.004-0.06mm	30
Clay	<0.004mm (slick)	5

Physiochemical Data	
Stream Width (feet)	6.5
Wetted Stream Width (feet)	1.8
Stream Depth (feet)	0.20
pH	8.09
Temperature (°C)	5.1
Conductivity (µS)	157
D.O.(mg/L)	12.49
Velocity (ft/sec.)	0.60
%CPOM	0%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	6
2. Epifaunal Substrate (riffle quality)	7
3. Pool Substrate Characterization	5
4. Pool Variability	6
5. Channel Alteration	12
6. Sediment Deposition	6
7. Channel Sinuosity	5
8. Channel Flow Status	16
9. Condition of Banks (both banks combined)	9
10. Bank Veg. Protection (both banks combined)	3
11. Grazing/Other Disruptive Pressure	1
12. Riparian Veg. Zone Width (both banks combined)	1
Total Score (maximum=240)	77
Total / 240 x 100 = Habitat Score	32%

% Morphology Types	
Riffle	70
Pool	15
Run	15

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	2
Snag	2
CPOM	Ø
SAV	3
Sand/Fine Sediment	3

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- site located in cow pasture
- cows have full access to stream, making banks beaten down & unstable
- Access road crosses stream & culvert allows stream to flow under road.
- upper reach begins at culvert under Hogs Run & a trib enters stream from culvert under Hogs Run on LB
- macros obs: chironomidae, tipulidae
- Tadpoles obs.

Flow = 96.95 gpm

D	V
.19	.21
.20	1.37
.20	.22

Investigator(s) Signature:

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation Rd. #2

Stream Name: Hayes Run

Stream ID#: 40632

Segment ID:

Station ID: H06-3

Sample Date: 2/7/11

Sampler(s): SG MB

[X] Pre-Mining

[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run	Pool/Glide	
Fines	Silt/Clay	<0.062	~~IIII~~ ~~IIII~~ ~~IIII~~ III	~~IIII~~	23
Sand	Very Fine	0.062 - 0.125	~~IIII~~ ~~IIII~~ II	~~IIII~~	17
	Fine	0.125 - 0.25	~~IIII~~ ~~IIII~~ I	II	13
	Medium	0.25 - 0.50	~~IIII~~ ~~IIII~~	II	12
	Coarse	0.5 - 1.00	~~IIII~~ ~~IIII~~	I	11
	Very Coarse	1.00 - 2.00	~~IIII~~ I I		7
Gravel	Very Fine	2.00 - 4.00	III		3
	Fine	4.00 - 5.70	IIII		4
	Fine	5.70 - 8.00	II		2
	Medium	8.00 - 11.3	II		2
	Medium	11.3 - 16.0	I		1
	Coarse	16.0 - 22.6	II		2
	Coarse	22.6 - 32.0	I		1
	Very Coarse	32.0 - 45.0	II		2
	Very Coarse	45.0 - 64.0			
Cobble	Small	64.0 - 90.0			
	Small	90.0 - 128			
	Large	128 - 180			
	Large	180 - 256			
Boulder	Small	256 - 362			
	Small	362 - 512			
	Medium	512 - 1,024			
	Large	1,024 - 2,048			
Bedrock	Large	>2,048			
		Totals:	85	15	100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Hoge Run 40632

Stream NHD #: 05020005001417

Sample Date: 2/7/2011

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S. Gill / M. Benson

Comments: HOG 3

Starting Lat/Long: 39° 52' 31.944" N / 80° 20' 34.364" W

Ending Lat/Long: 39° 52' 30.379" N / 80° 20' 30.772" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	2
Snag	2
Coarse Particulate Organic Matter	0
Submerged Aquatic Vegetation	3
Sand/Fine Sediment	3

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1- 4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Trichoptera		Phryganeidae		*Ptilostomis*	U	SH	5		1						
Trichoptera		Limnephilidae	U			SH	4	2							
Trichoptera		Limnephilidae		*Ironoquia*	U	SH	3		1						
Diptera		Chironomidae	M			CG	6	220							
Diptera		Ceratopogonidae	M			PR	6	1							
Bivalvia		Sphaeriidae	U			FC	8	2							
				Total Number of Individuals:				225	2	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	04-16-10
Time:	2:30 PM
Investigator:	GM WR

Project Name/Area:	Foundation (Round #1)
Sample Identifier:	HOU 1

Investigator Signature: Gregory M Moore

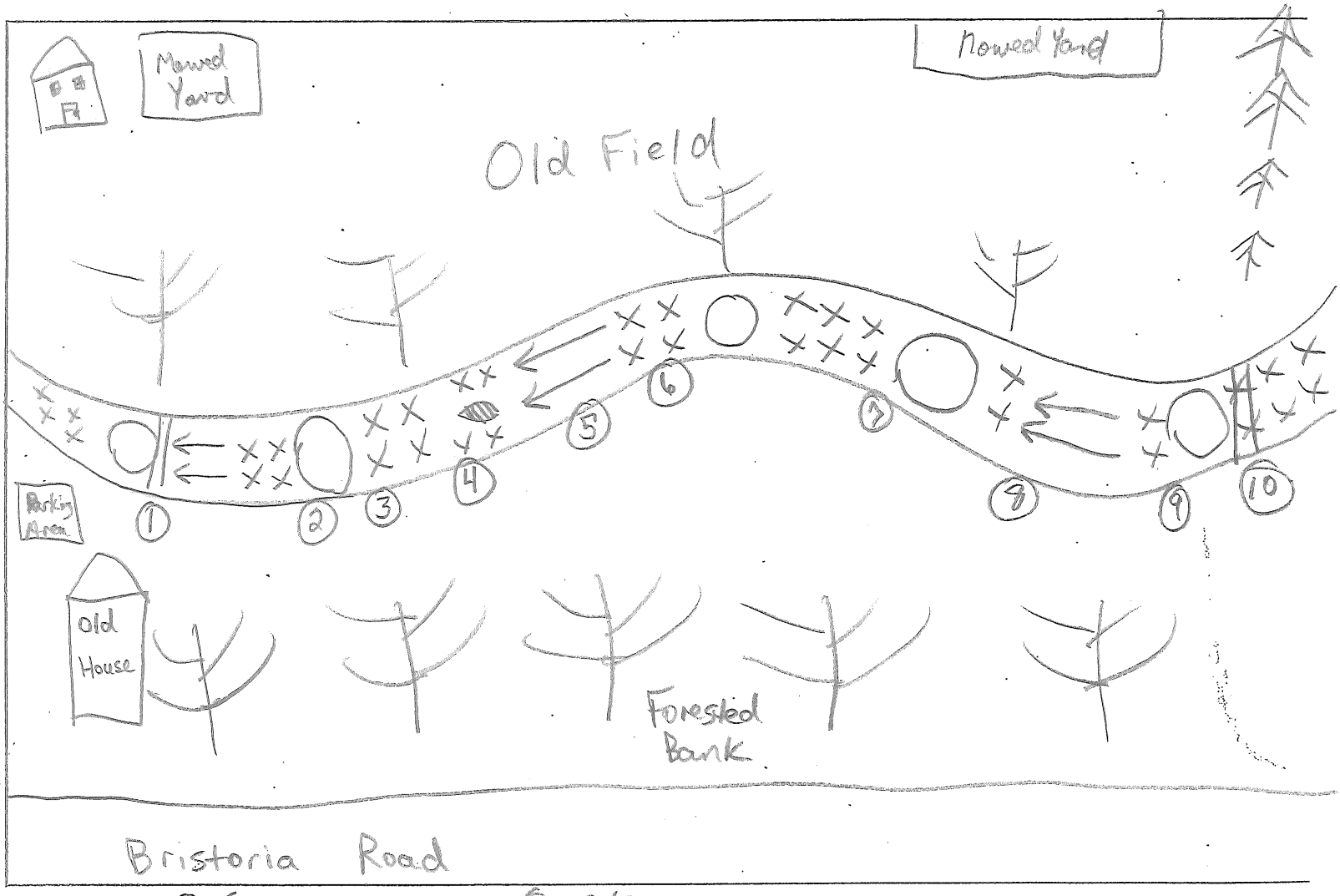
Investigator Signature: [illegible]

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

= island

Indicate direction of flow with an arrow



1. Snag
2. SFS
3. C/G
4. CPOM
5. SAV
6. C/G
7. SFS
8. SAV
9. CPOM
10. Snag

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation (Round #1)
Sample Identifier:	HOU 1
Date:	04-16-10
Time:	2:30 PM
Investigator(s):	GM WR

Latitude:	39° 51' 17.8" N
Longitude:	80° 18' 53.6" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Precipitation in last 7 days? (Y) N

Land Use (%)	
Residential	20%
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	30%
Forest	40%
Cropland	0
Pasture	0
Other (explain below in notes)	10%
Canopy Cover (%)	60%

Substrate Type	Diameter	% Composition
Bedrock		5%
Boulder	>256mm (10")	5%
Cobble	64-256mm (2.5"-10")	20%
Gravel	2-64mm (0.1"-2.5")	25%
Sand	0.06-2mm (gritty)	25%
Silt	.004-0.06mm	15%
Clay	<0.004mm (slick)	5%

Physiochemical Data	
Stream Width (feet)	17.0
Wetted Stream Width (feet)	12.2
Stream Depth (feet)	0.39
pH	8.29
Temperature (°C)	18.3
Conductivity (µS)	127.9
D.O.(mg/L)	10.2
Velocity (ft/sec.)	0.35
%CPOM	10%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	19
2. Epifaunal Substrate (riffle quality)	17
3. Pool Substrate Characterization	14
4. Pool Variability	10
5. Channel Alteration	15
6. Sediment Deposition	11
7. Channel Sinuosity	7
8. Channel Flow Status	11
9. Condition of Banks (both banks combined)	6
10. Bank Veg. Protection (both banks combined)	12
11. Grazing/Other Disruptive Pressure	10
12. Riparian Veg. Zone Width (both banks combined)	10
Total Score (maximum=240)	142
Total / 240 x 100 = Habitat Score	59%

% Morphology Types	
Riffle	40%
Pool	35%
Run	25%

Habitat Sampled[1]	Number of kicks	
Cobble/Gravel	11	2
Snag	11	2
CPOM	11	2
SAV	11	2
Sand/Fine Sediment	11	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

Macros Obs. Perlodidae, Heptageniidae, Cambaridae, Tipulidae, Hydropsychidae, Psephenidae

Bedrock in lower reach

All habitats sampled

Great Fish Cover Numerous Snags, undercut banks etc.

Banks show signs of erosion

Land Use Other 10% - Bristoria Road

GPM = 741.33

Investigator(s) Signature:

Gregory M. Moore

Wes Reichard

~~HH~~
~~HH~~

Pebble Count

Inches		Particle	Millimeters	
	Sand	Silt/clay	0.062	~~HH~~ ~~HH~~ II
		Very Fine	0.062 - 0.13	~~HH~~
		Fine	0.13 - 0.25	III
		Medium	.25 - .50	~~HH~~ I
		Coarse	.50 - 1.0	~~HH~~
.04 - .08		Very Coarse	1.0 - 2.0	~~HH~~ III
0.8 - .16	Gravel	Very Fine	2.0 - 4.0	~~HH~~ I
.16 - .22		Fine	4.0 - 6.0	~~HH~~ III
.22 - .31		Fine	6.0 - 8.0	IIII
.31 - .44		Medium	8.0 - 11.0	II
.44 - .63		Medium	11.0 - 16.0	~~HH~~
.63 - .89		Coarse	16 - 22	II
.89-1.3		Coarse	22 - 32	IIII
1.3 - 1.8		Very Coarse	32 - 45	II
1.8 - 2.5		Very Coarse	45 - 64	~~HH~~
2.5 - 3.5	Cobble	Small	64 - 90	~~HH~~
3.5 - 5.0		Small	90 - 128	IIII
5.0 - 7.1		Large	128 - 180	~~HH~~ I
7.1 - 10.1		Large	180 - 256	III
10.1 - 14.3	Boulder	Small	256 - 362	III
14.3 - 20		Small	362 - 512	I
20 - 40		Medium	512 - 1024	I
40 - 80		Large-Vry Large	1024 - 2048	
		Bedrock		

Sample Name: Hou 1

Investigator Signature Gregory M Moore

Investigator Signature Wes Rockwood

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: House Run 40635

Stream NHD #: 05020005001418

Sample Date: 4/16/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): G. Moore, W. Reichard

Comments: HOU 1

Starting Lat/Long: 39° 51' 17.035" N / 80° 18' 55.495" W
Ending Lat/Long: 39° 51' 17.291" N / 80° 18' 51.538" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	2
Snag	2
Coarse Particulate Organic Matter	2
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-8		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Ameletidae		*Ameletus*	U	CG	0		1						
Ephemeroptera		Heptageniidae		*Maccaffertium*	U	SC	3		1						
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		5						
Plecoptera		Perlodidae		*Isoperla*	U	PR	2		1						
Trichoptera		Limnephilidae	U			SH	4	1							
Trichoptera		Hydroptilidae		*Hydroptila*	U	SC	6		1						
Trichoptera		Leptoceridae		*Mystacides*	U	CG	4		1						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		11						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		6						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		6						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		2						
Diptera		Chironomidae	M			CG	6	91							
Diptera		Ceratopogonidae		*Probezzia*	M	PR	6		2						
Diptera		Simuliidae		*Simulium*	*	FC	6		23						
Diptera		Simuliidae		*Prosimulium*	*	FC	2		1						
Diptera		Tipulidae	*			SH	4	1							
Diptera		Tipulidae		*Tipula*	*	SH	4		3						
Diptera		Tipulidae		*Hexatoma*	*	PR	2		8						
Diptera		Tipulidae		*Pseudolimnophila*	*	PR	2		2						
Diptera		Tabanidae		*Chrysops*	*	PI	7		1						
Megaloptera		Corydalidae		*Nigronia*	U	PR	2		1						
Decapoda		Cambaridae		*Cambarus*	*	CG	6		1						
Annelida		Oligochaeta	*			CG	10	2							
				Total Number of Individuals:				95	77	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America* (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	11/15/10
Time:	1:30
Investigator:	AG.GM

Project Name/Area:	Foundation Rd. 2
Sample Identifier:	HOW 1

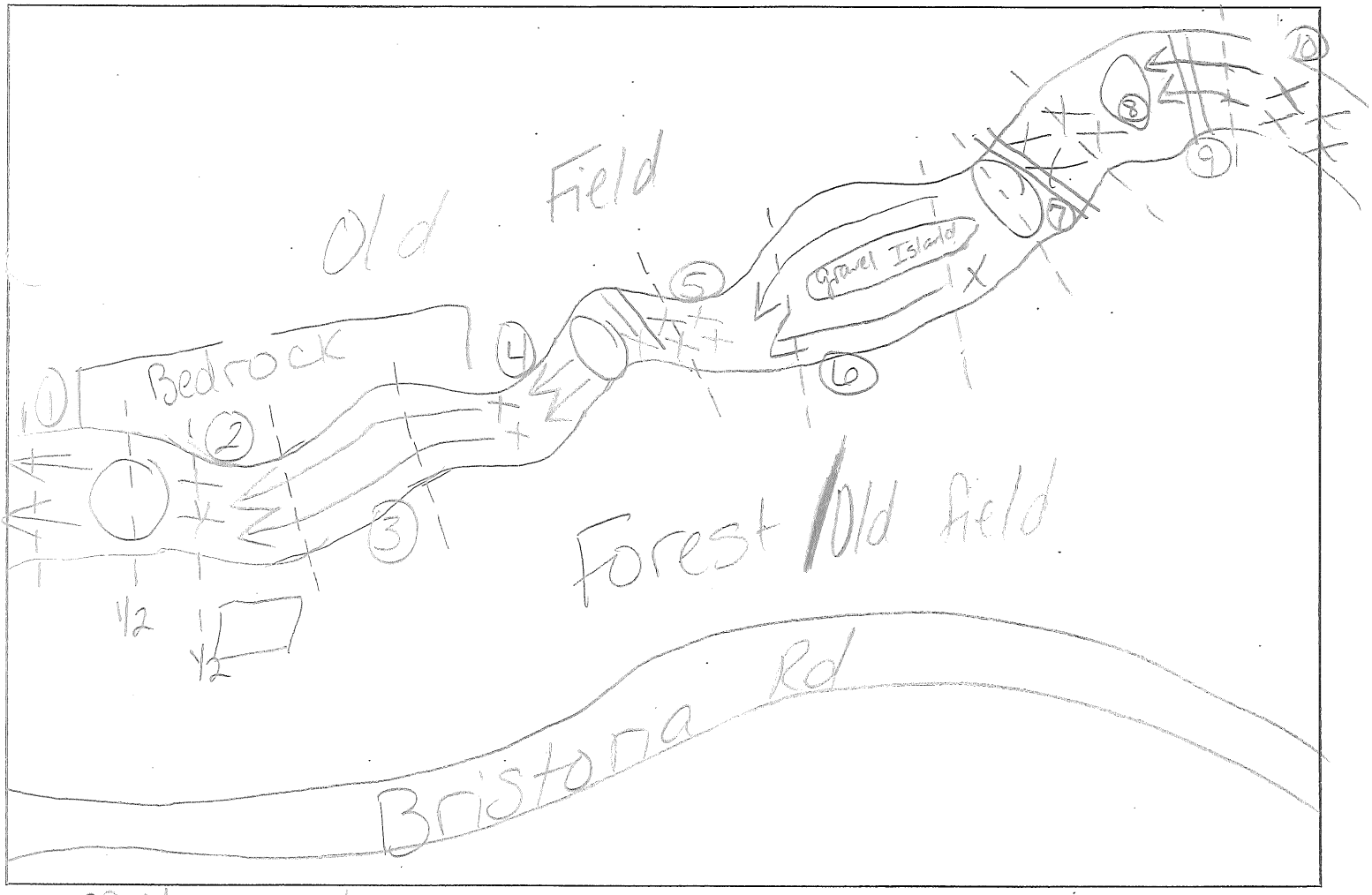
Investigator Signature: Adam Dunton

Investigator Signature: Gregory M. Moore

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 CPOM
2 SAv
3 CPOM
4 c/g
5 c/g
6 SAv
7 Snag
8 SFS
9 Snag
10 c/g

Pebble Count

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd. 2
Sample Identifier:	HOU1
Date:	11/15/10
Time:	1:30
Investigator(s):	AG, GM

Latitude:	39° 51' 17.79" N
Longitude:	80° 18' 53.75" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	10
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	60
Forest	30
Cropland	0
Pasture	0
Other (explain below in notes)	0
Canopy Cover (%)	20%

Substrate Type	Diameter	% Composition
Bedrock		15
Boulder	>256mm (10")	5
Cobble	64-256mm (2.5"-10")	10
Gravel	2-64mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	20
Silt	.004-0.06mm	5
Clay	<0.004mm (slick)	10

Physiochemical Data	
Stream Width (feet)	6.0
Wetted Stream Width (feet)	2.0
Stream Depth (feet)	0.11
pH	7.54
Temperature (°C)	6.2
Conductivity (µS)	262
D.O.(mg/L)	11.8
Velocity (ft/sec.)	0.50
%CPOM	30%
%FPOM	10%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	12
2. Epifaunal Substrate (riffle quality)	13
3. Pool Substrate Characterization	11
4. Pool Variability	8
5. Channel Alteration	15
6. Sediment Deposition	14
7. Channel Sinuosity	8
8. Channel Flow Status	7
9. Condition of Banks (both banks combined)	12
10. Bank Veg. Protection (both banks combined)	12
11. Grazing/Other Disruptive Pressure	14
12. Riparian Veg. Zone Width (both banks combined)	14
Total Score (maximum=240)	140
Total / 240 x 100 = Habitat Score	58%

% Morphology Types	
Riffle	25
Pool	15
Run	60

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	III
Snag	II
CPOM	II
SAV	II
Sand/Fine Sediment	II

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- Low flow
- Some macros obs
- Bridge below the bottom reach
- SFS present, but there aren't any bars present
- Bedrock in lower reach

50.49 gpm

nvestigator(s) Signature:

Adam Gilchrist

Gregory M. Moore

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation Rd. 2 Stream Name: House Run

Stream ID#: 40635 Segment ID:

Station ID: HOU 1 Sample Date: 11/15/10

Sampler(s): AG, GM

[X] Pre-Mining

[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count ½ Riffle/Run	Particle Count ½ Pool/Glide	Total
Fines	Silt/Clay	<0.062	5	2	7
Sand	Very Fine	0.062 - 0.125	5	2	7
	Fine	0.125 - 0.25	3	1	4
	Medium	0.25 - 0.50	5		5
	Coarse	0.5 - 1.00	3		3
	Very Coarse	1.00 - 2.00	1	2	3
Gravel	Very Fine	2.00 - 4.00	5		5
	Fine	4.00 - 5.70	4	1	5
	Fine	5.70 - 8.00	5		5
	Medium	8.00 - 11.3	5		5
	Medium	11.3 - 16.0	7		7
	Coarse	16.0 - 22.6	4	1	5
	Coarse	22.6 - 32.0	4		4
	Very Coarse	32.0 - 45.0	4		4
	Very Coarse	45.0 - 64.0	3		3
Cobble	Small	64.0 - 90.0	3	1	4
	Small	90.0 - 128	2	1	3
	Large	128 - 180	3	1	4
	Large	180 - 256		1	1
Boulder	Small	256 - 362	2		2
	Small	362 - 512	1		1
	Medium	512 - 1,024			
	Large	1,024 - 2,048			
Bedrock	Large	>2,048	9	2	13
		Totals:	85	15	100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: House Run 40635

Stream NHD #: 05020005001418

Sample Date: 11/15/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): A. Greathouse / G. Moore

Comments: HOU 1

Starting Lat/Long: 39° 51' 17.035" N / 80° 18' 55.495" W
Ending Lat/Long: 39° 51' 17.291" N / 80° 18' 51.538" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	3
Snag	2
Coarse Particulate Organic Matter	2
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	1

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Plecoptera		Capniidae	U			SH	3	10							
Plecoptera		Capniidae		*Allocapnia*	U	SH	3		119						
Plecoptera		Perlodidae		*Isoperla*	U	PR	2		1						
Trichoptera		Limnephilidae		*Pycnopsyche*	U	SH	4		1						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		3						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		3						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		9						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		12						
Diptera		Chironomidae	M			CG	6	27							
Diptera		Ceratopogonidae	M			PR	6	1							
Diptera		Tipulidae		*Tipula*	*	SH	4		2						
Megaloptera		Corydalidae		*Nigronia*	U	PR	2		1						
				Total Number of Individuals:				38	151	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	04-16-10
Time:	1:15 PM
Investigator:	GM WR

Project Name/Area:	Foundation (Round #1)
Sample Identifier:	HOU 2

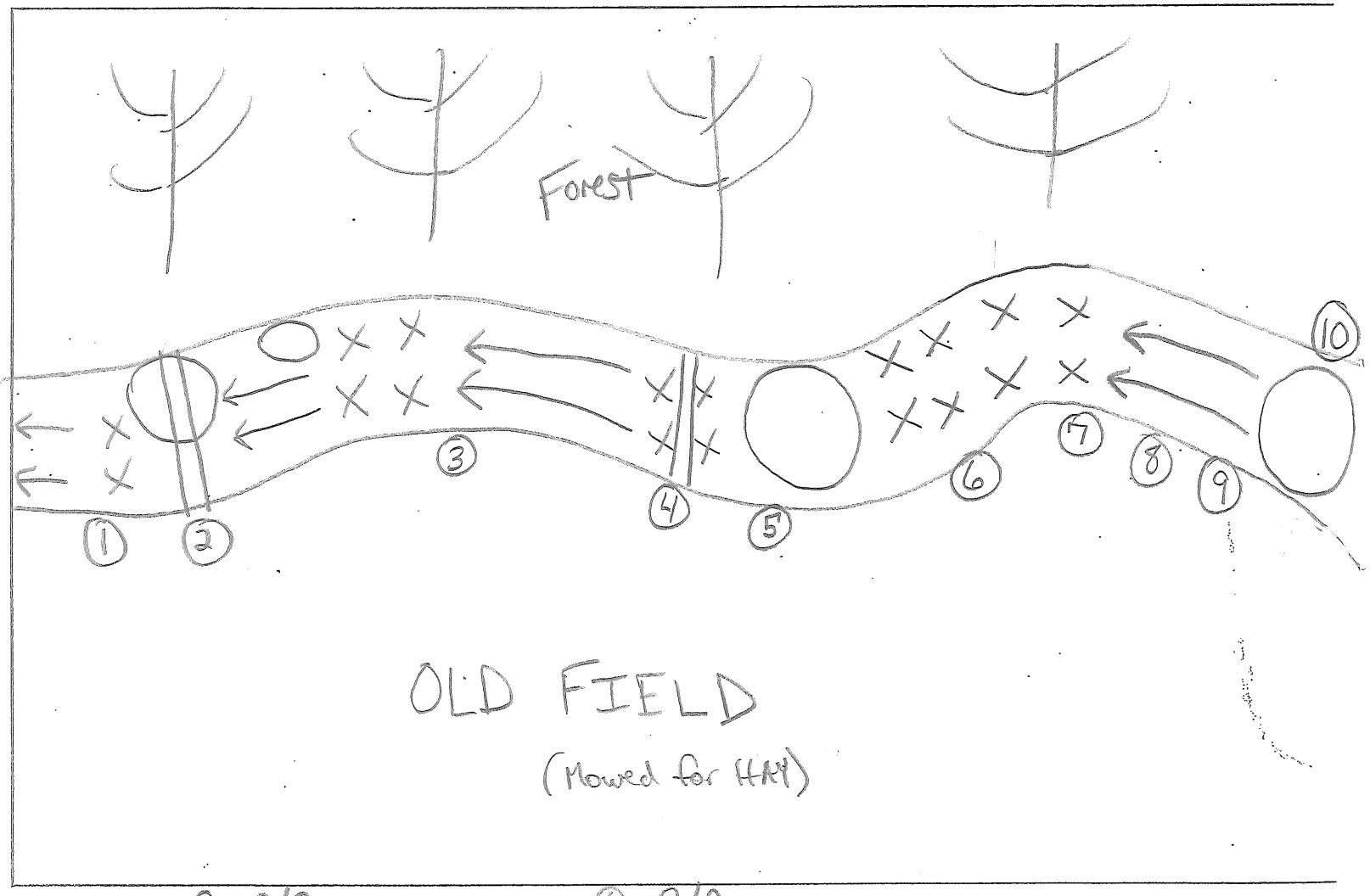
Investigator Signature: Gregory M. Moore

Investigator Signature: Wes Reichard

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1. C/G
2. Snag
3. SAV
4. Snag
5. SFS
6. C/G
7. SFS
8. SAV
9. CPOM
10. CPOM

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation (Round #1)
Sample Identifier:	HOU 2
Date:	04-16-10
Time:	1:15 PM
Investigator(s):	GM WR

Latitude:	39° 51' 11.8" N
Longitude:	80° 19' 41.9" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary: ☐

Mainstem: X

Precipitation in last 7 days? (Y) N

Land Use (%)	
Residential	0
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	50%
Forest	50%
Cropland	0
Pasture	0
Other (explain below in notes)	0
Canopy Cover (%)	50%

Substrate Type	Diameter	% Composition
Bedrock		0%
Boulder	>256mm (10")	5%
Cobble	64-256mm (2.5"-10")	25%
Gravel	2-64mm (0.1"-2.5")	25%
Sand	0.06-2mm (gritty)	25%
Silt	.004-0.06mm	20%
Clay	<0.004mm (slick)	0%

Physiochemical Data	
Stream Width (feet)	22.0
Wetted Stream Width (feet)	14.0
Stream Depth (feet)	0.30
pH	8.25
Temperature (°C)	16.3
Conductivity (µS)	154.5
D.O.(mg/L)	11.3
Velocity (ft/sec.)	0.31
%CPOM	5%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	18
2. Epifaunal Substrate (riffle quality)	18
3. Pool Substrate Characterization	13
4. Pool Variability	10
5. Channel Alteration	19
6. Sediment Deposition	11
7. Channel Sinuosity	6
8. Channel Flow Status	8
9. Condition of Banks (both banks combined)	7
10. Bank Veg. Protection (both banks combined)	15
11. Grazing/Other Disruptive Pressure	15
12. Riparian Veg. Zone Width (both banks combined)	15
Total Score (maximum=240)	155
Total / 240 x 100 = Habitat Score	65%

% Morphology Types	
Riffle	35%
Pool	30%
Run	35%

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	2
Snag	2
CPOM	2
SAV	2
Sand/Fine Sediment	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

Macros Obs. Cambaridae, Tipulidae, Perlodidae, Heptageniidae, Anisoptera, Hydropsychidae, Simuliidae

Fish Observed
Algae on some rocks
Even mix of substrate
Some new bar formation
Old field probably only mowed twice a year for hay
Alot of substrate showing in places

GPM = 586.17

Investigator(s) Signature:

Gregory M. Moore

Wes Reichard

Revised 6/09

Pebble Count

Inches		Particle	Millimeters	
	Sand	Silt/clay	0.062	~~HH~~ ~~HH~~
		Very Fine	0.062 - 0.13	
		Fine	0.13 - 0.25	II
		Medium	.25 - .50	III
		Coarse	.50 - 1.0	~~HH~~
.04 - .08		Very Coarse	1.0 - 2.0	~~HH~~ III
0.8 - .16	Gravel	Very Fine	2.0 - 4.0	~~HH~~ III
.16 - .22		Fine	4.0 - 6.0	~~HH~~ II
.22 - .31		Fine	6.0 - 8.0	IIII
.31 - .44		Medium	8.0 - 11.0	III
.44 - .63		Medium	11.0 - 16.0	~~HH~~ IIII
.63 - .89		Coarse	16 - 22	~~HH~~ II
.89-1.3		Coarse	22 - 32	II
1.3 - 1.8		Very Coarse	32 - 45	IIII
1.8 - 2.5		Very Coarse	45 - 64	~~HH~~
2.5 - 3.5	Cobble	Small	64 - 90	~~HH~~ III
3.5 - 5.0		Small	90 - 128	IIII
5.0 - 7.1		Large	128 - 180	~~HH~~ III
7.1 - 10.1		Large	180 - 256	I
10.1 - 14.3	Boulder	Small	256 - 362	II
14.3 - 20		Small	362 - 512	
20 - 40		Medium	512 - 1024	
40 - 80		Large-Vry Large	1024 - 2048	
		Bedrock		

Sample Name: HOU 2

Investigator Signature Gregory M. Moore

Investigator Signature [illegible]

5600-PM-MR0324 Rev. 9/2008

FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: House Run 40635

Stream NHD #: 05020005001418

Sample Date: 4/16/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): G. Moore, W. Reichard

Comments: HOU 2

Starting Lat/Long: 39° 51' 11.451" N / 80° 19' 39.614" W
Ending Lat/Long: 39° 51' 11.003" N / 80° 19' 43.760" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	2
Snag	2
Coarse Particulate Organic Matter	2
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-6		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Ephemerellidae		*Ephemerella*	U	CG	1		1						
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		2						
Ephemeroptera		Ephemeridae		*Ephemera*	U	CG	2		3						
Trichoptera		Phryganeidae		*Ptilostomis*	U	SH	5		2						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		26						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		10						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		12						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		1						
Diptera		Chironomidae	M			CG	6	59							
Diptera		Ceratopogonidae		*Probezzia*	M	PR	6		1						
Diptera		Ceratopogonidae		*Ceratopogon*	M	PR	6		1						
Diptera		Simuliidae		*Simulium*	*	FC	6		4						
Diptera		Tipulidae		*Tipula*	*	SH	4		5						
Diptera		Tipulidae		*Hexatoma*	*	PR	2		15						
Diptera		Tipulidae		*Pseudolimnophila*	*	PR	2		11						
Decapoda		Cambaridae		*Cambarus*	*	CG	6		2						
Annelida		Oligochaeta	*			CG	10	9							
Odonata		Cordulegastridae		*Cordulegaster*	U	PR	3		2						
				Total Number of Individuals:				68	98	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America (*Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	2-8-11
Time:	9:40 AM
Investigator:	SG MB

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	HOU 2

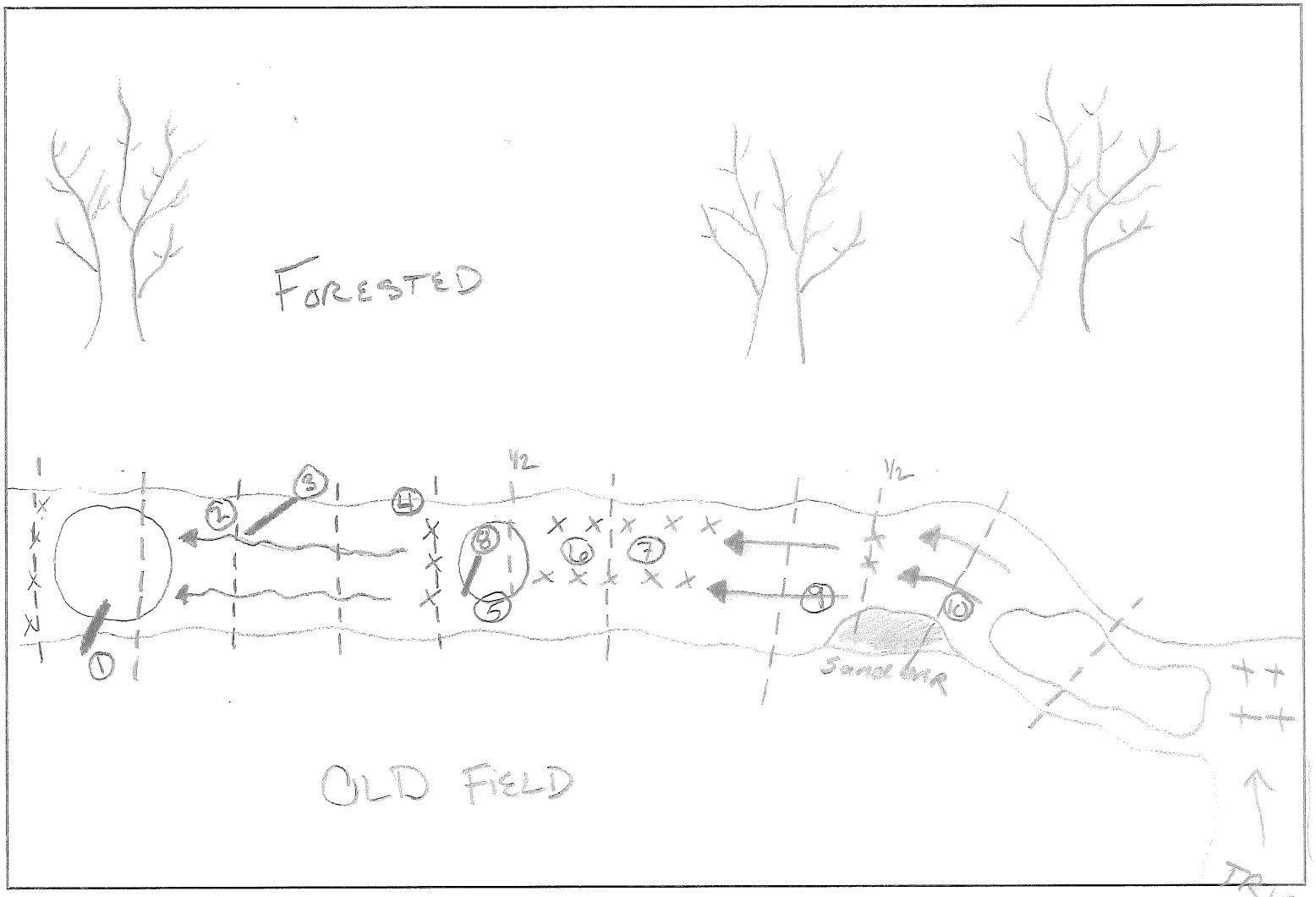
Investigator Signature _____

Investigator Signature _____

LEGEND

Riffle = X
Pool = 0
Run = ⟶
Snag = ═══

Indicate direction of flow with an arrow



1. SNAG
2. SAV
3. SNAG
4. SAV
5. SFS
6. C/G
7. C/G
8. SNAG
9. SFS
10. CPOM

WPI
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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	HOU 2
Date:	2/8/11
Time:	9:40AM
Investigator(s):	SG MB

Latitude:	39° 51' 11.54" N
Longitude:	80° 19' 42.13" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	Ø
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Old Fields/Old Pasture	50
Forest	50
Cropland	Ø
Pasture	Ø
Other (explain below in notes)	Ø
Canopy Cover (%)	20%

Substrate Type	Diameter	% Composition
Bedrock		Ø
Boulder	>256mm (10")	Ø
Cobble	64-256mm (2.5"-10")	30
Gravel	2-64mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	20
Silt	.004-0.06mm	15
Clay	<0.004mm (slick)	Ø

Physiochemical Data	
Stream Width (feet)	12.9
Wetted Stream Width (feet)	11.9
Stream Depth (feet)	0.30
pH	7.87
Temperature (°C)	1.4
Conductivity (µS)	174.4
D.O.(mg/L)	14.55
Velocity (ft/sec.)	1.83
%CPOM	5%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	16
2. Epifaunal Substrate (riffle quality)	18
3. Pool Substrate Characterization	9
4. Pool Variability	9
5. Channel Alteration	19
6. Sediment Deposition	13
7. Channel Sinuosity	5
8. Channel Flow Status	17
9. Condition of Banks (both banks combined)	6
10. Bank Veg. Protection (both banks combined)	13
11. Grazing/Other Disruptive Pressure	15
12. Riparian Veg. Zone Width (both banks combined)	11
Total Score (maximum=240)	151
Total / 240 x 100 = Habitat Score	63%

% Morphology Types	
Riffle	40
Pool	25
Run	35

Habitat Sampled[1]	Number of kicks	
Cobble/Gravel	II	2
Snag	III	3
CPOM	I	1
SAV	II	2
Sand/Fine Sediment	II	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- MACROS obs, fish, salamanders, crayfish
- banks unstable on both sides
- LB old field, not maintained or cut often
- RB Forested
- pools pitts, somewhat large but shallow
- trib flows in @ top of reach of LB

D	V
.08	.30
.45	3.13
.50	4.50
.30	2.23
.25	.89
.30	.63
.19	.85

Flow = 2932.25 gpm

Investigator(s) Signature:

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation Rd #2

Stream Name: House Run

Stream ID#: 40635

Segment ID:

Station ID: HOU 2

Sample Date: 2/8/11

Sampler(s): SG MB

[X] Pre-Mining

[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run 1/2	Pool/Glide 1/2	
Fines	Silt/Clay	<0.062	III	~~IIII~~ II	10
Sand	Very Fine	0.062 - 0.125	I	II	3
	Fine	0.125 - 0.25	~~IIII~~	III	8
	Medium	0.25 - 0.50	I	I	2
	Coarse	0.5 - 1.00		II	2
	Very Coarse	1.00 - 2.00	~~IIII~~	IIII	9
Gravel	Very Fine	2.00 - 4.00	~~IIII~~ I	III	9
	Fine	4.00 - 5.70	III	III	6
	Fine	5.70 - 8.00	II		2
	Medium	8.00 - 11.3	IIII		4
	Medium	11.3 - 16.0	~~IIII~~ I		6
	Coarse	16.0 - 22.6	IIII		4
	Coarse	22.6 - 32.0	~~IIII~~		5
	Very Coarse	32.0 - 45.0	~~IIII~~ I		6
	Very Coarse	45.0 - 64.0	~~IIII~~ II		7
Cobble	Small	64.0 - 90.0	~~IIII~~ IIII		9
	Small	90.0 - 128	II		2
	Large	128 - 180	IIII		4
	Large	180 - 256	II		2
Boulder	Small	256 - 362			
	Small	362 - 512			
	Medium	512 - 1,024			
	Large	1,024 - 2,048			
Bedrock	Large	>2,048			
		Totals:	75	25	100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: House Run 40635

Stream NHD #: 05020005001418

Sample Date: 2/8/2011

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S.Gill / M. Lee

Comments: HOU 2

Starting Lat/Long: 39° 51' 11.451" N / 80° 19' 39.614" W
Ending Lat/Long: 39° 51' 11.003" N / 80° 19' 43.760" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	2
Snag	3
Coarse Particulate Organic Matter	1
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1- 8		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		2						
Plecoptera		Capniidae	U			SH	3	4							
Plecoptera		Capniidae		*Allocapnia*	U	SH	3		47						
Plecoptera		Perlodidae		*Diploperla*	U	PR	2		1						
Plecoptera		Taeniopterygidae		*Taeniopteryx*	U	SH	2		1						
Trichoptera		Phryganeidae		*Ptilostomis*	U	SH	5		7						
Trichoptera		Limnephilidae	U			SH	4	1							
Trichoptera		Limnephilidae		*Pycnopsyche*	U	SH	4		3						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		1						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		1						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		2						
Diptera		Chironomidae	M			CG	6	71							
Diptera		Ceratopogonidae	M			PR	6	1							
Diptera		Simuliidae		*Prosimulium*	*	FC	2		1						
Diptera		Tipulidae	*			SH	4	1							
Diptera		Tipulidae		*Limnophila*	*	PR	3		1						
Diptera		Tipulidae		*Tipula*	*	SH	4		2						
Diptera		Tipulidae		*Dicranota*	*	PR	3		1						
Diptera		Tipulidae		*Hexatoma*	*	PR	2		1						
Diptera		Tipulidae		*Pseudolimnophila*	*	PR	2		1						
Diptera		Tabanidae		*Chrysops*	*	PI	7		1						
Diptera		Psychodidae		*Pericoma*	*	CG	4		1						
Megaloptera		Corydalidae		*Nigronia*	U	PR	2		2						
Megaloptera		Sialidae		*Sialis*	U	PR	6		1						
Bivalvia		Sphaeriidae	U			FC	8	5							
Gastropoda		Physidae	U			SC	8	1							
Decapoda		Cambaridae		*Orconectes*	*	CG	6		1						
Annelida		Oligochaeta	*			CG	10	5							
				Total Number of Individuals:				89	78	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date: 4/20/10	Project Name/Area: Foundation (Rd. 1)
Time: 8:50 AM	Sample Identifier: McR 1
Investigator: SG RP	

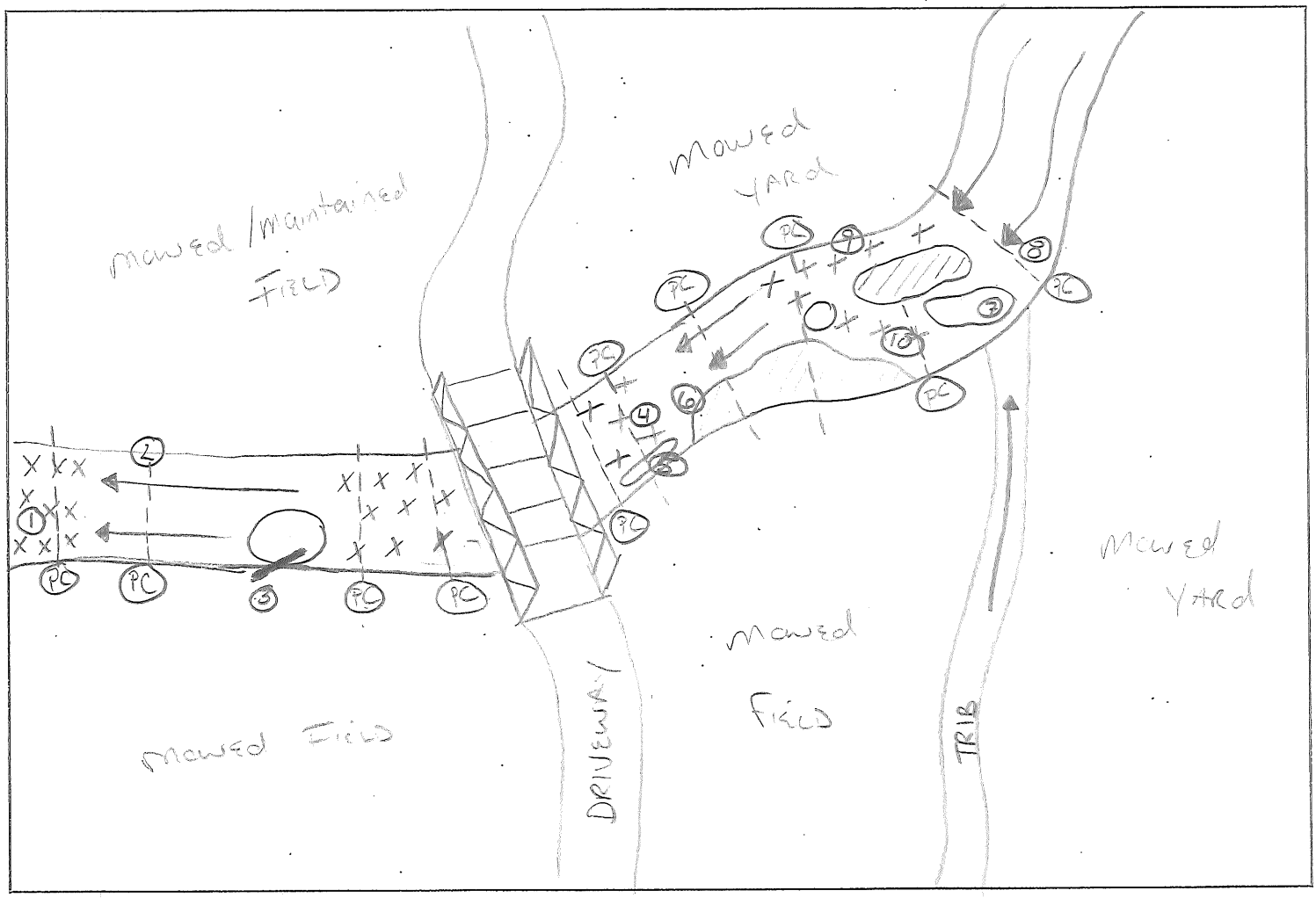
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 C/G	6 SAV
2 SAV	7 CPOM
3 SNAG	8 SFS
4 C/G	9 C/G
5 SFS	10 C/G

Appendix B- Low Gradient Stream Sampling Field Delineation Form

WPI
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Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	MCR 1
Date:	4/20/10
Time:	8:50 AM
Investigator(s):	SG RP

Latitude:	39° 53' 47.36" N
Longitude:	80° 11' 12.96" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary: [ ]

Mainstem: [X]

Precipitation in last 7 days? (Y) N

Land Use (%)	
Residential	100
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Old Fields/Old Pasture	Ø
Forest	Ø
Cropland	Ø
Pasture	Ø
Other (explain below in notes)	Ø
Canopy Cover (%)	0%

Substrate Type	Diameter	% Composition
Bedrock		Ø
Boulder	>256mm (10")	10
Cobble	64-256mm (2.5"-10")	20
Gravel	2-64mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	10
Silt	.004-0.06mm	20
Clay	<0.004mm (slick)	5

Physiochemical Data	
Stream Width (feet)	24.0
Wetted Stream Width (feet)	24.0
Stream Depth (feet)	0.53
pH	7.89
Temperature (°C)	8.2
Conductivity (µS)	215
D.O.(mg/L)	5.8
Velocity (ft/sec.)	0.58
%CPOM	<5%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	16
2. Epifaunal Substrate (riffle quality)	17
3. Pool Substrate Characterization	12
4. Pool Variability	11
5. Channel Alteration	16
6. Sediment Deposition	17
7. Channel Sinuosity	6
8. Channel Flow Status	19
9. Condition of Banks (both banks combined)	8
10. Bank Veg. Protection (both banks combined)	11
11. Grazing/Other Disruptive Pressure	5
12. Riparian Veg. Zone Width (both banks combined)	1
Total Score (maximum=240)	139
Total / 240 x 100 = Habitat Score	58%

% Morphology Types	
Riffle	40
Pool	10
Run	50

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	|||| 4
Snag	| 1
CPOM	| 1
SAV	|| 2
Sand/Fine Sediment	|| 2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

Macros obs: Zygoptera, Perlodidae

Stream flows under bridge to driveway

-trib flows in from LB in upper reach

Old sand bars w/ veg. growing on pres in upper reach

Majority of reach riffle/run habitat

Fish obs.

-stream width & wetted

• lots of algae on rocks

D	V
.20	.12
.86	.90
.90	1.16
.60	.67
.40	.44
.21	.20

• Flow = 3310.36 gpm

Investigator(s) Signature:

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R: 𝍸 IIII
P: I

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation

Stream Name: McCourtney Run

Stream ID#: 40628

Segment ID:

Station ID: MCR 1

Sample Date: 4/20/10

Sampler(s): SG RP

☒ Pre-Mining ☐ Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run	Pool/Glide	
Fines	Silt/Clay	<0.062	𝍸 𝍸 𝍸 𝍸 I		21
Sand	Very Fine	0.062-0.125			
	Fine	0.125 – 0.25		III	3
	Medium	0.25 – 0.50		II	2
	Coarse	0.05 – 1.00	III	II	5
	Very Coarse	1.00 – 2.00	II	I	3
Gravel	Very Fine	2.00 – 4.00	𝍸 III		8
	Fine	4.00 - 5.70	𝍸 I		6
	Fine	5.70 - 8.00	I		1
	Medium	8.00 - 11.3	II		2
	Medium	11.3 - 16.0	IIII	I	5
	Coarse	16.0 - 22.6	IIII		4
	Coarse	22.6 - 32.0	𝍸 I	I	7
	Very Coarse	32.0 – 45.0	𝍸 𝍸		10
	Very Coarse	45.0 – 64.0	𝍸 III		8
Cobble	Small	64.0 - 90.0	II		2
	Small	90.0 - 128	III		3
	Large	128 - 180	𝍸		5
	Large	180 - 256	II		2
Boulder	Small	256 - 362	II		2
	Small	362 - 512	I		1
	Medium	512 - 1,024			
	Large	1,024 - 2,048			
Bedrock	Large	>2,048			
		Totals:	90	10	

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: McCourtney Run 40628

Stream NHD #: 05020005000192

Sample Date: 4/20/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S. Gill, R. Paulenich

Comments: MCR 1

Starting Lat/Long: 39° 51' 51.421" N / 80° 18' 0.236" W
Ending Lat/Long: 39° 51' 48.754" N / 80° 18' 2.075" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	4
Snag	1
Coarse Particulate Organic Matter	1
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Ameletidae		*Ameletus*	U	CG	0		1						
Ephemeroptera		Ephemerellidae		*Eurylophella*	U	SC	4		4						
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		5						
Plecoptera		Perlodidae		*Isoperla*	U	PR	2		4						
Plecoptera		Perlodidae		*Diploperla*	U	PR	2		1						
Trichoptera		Limnephilidae		*Anabolia*	U	SH	5		2						
Trichoptera		Hydropsychidae		*Hydropsyche*	U	FC	5		1						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		4						
Trichoptera		Rhyacophilidae		*Rhyacophila*	U	PR	1		2						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		44						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		7						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		6						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		10						
Diptera		Chironomidae	M			CG	6	124							
Diptera		Ceratopogonidae		*Probezzia*	M	PR	6		5						
Diptera		Simuliidae		*Simulium*	*	FC	6		5						
Diptera		Simuliidae		*Prosimulium*	*	FC	2		2						
Diptera		Tipulidae		*Tipula*	*	SH	4		1						
Diptera		Tipulidae		*Hexatoma*	*	PR	2		3						
Diptera		Tipulidae		*Limonia*	*	SH	6		1						
Diptera		Dolichopodidae	*			PR	4	1							
Gastropoda		Physidae	U			SC	8	1							
Odonata		Calopterygidae		*Calopteryx*	U	PR	6		2						
				Total Number of Individuals:				126	110	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America* (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	2/7/11
Time:	9:00 AM
Investigator:	JLS MB

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	MCR 1

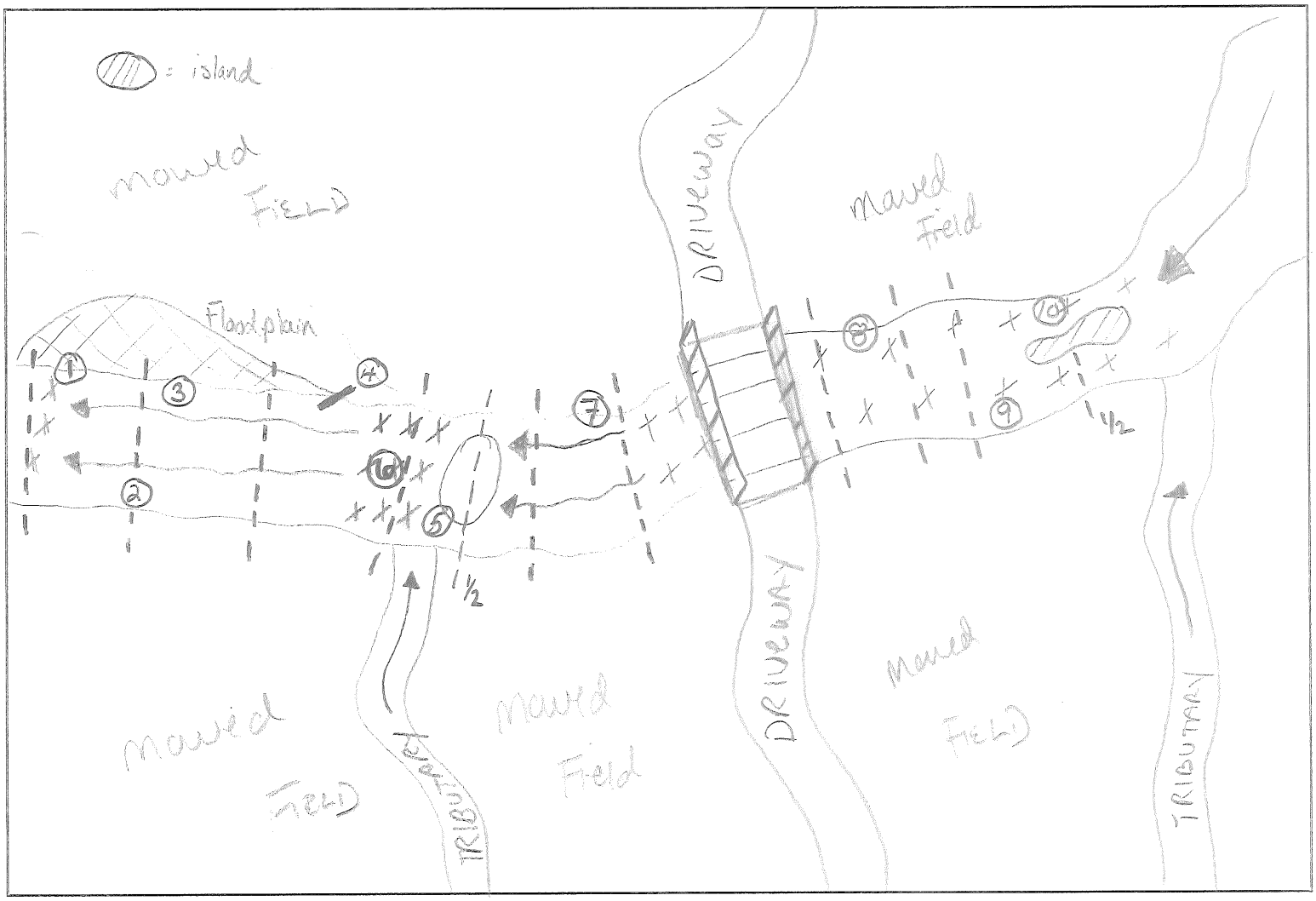
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 SAV	6 CIG
2 SFS	7 SAV
3 SFS	8 CIG
4 SNAG	9 SAV
5 CPOM	10 CIG

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	MCR 2
Date:	2/7/11
Time:	9:00 AM
Investigator(s):	SLT MB

Latitude:	39° 51' 50.33" N
Longitude:	80° 18' 1.55" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	50
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Mowed Old Fields/Old Pasture	50
Forest	Ø
Cropland	Ø
Pasture	Ø
Other (explain below in notes)	Ø
Canopy Cover (%)	Ø %

Substrate Type	Diameter	% Composition
Bedrock		Ø
Boulder	>256mm (10")	5
Cobble	64-256mm (2.5"-10")	30
Gravel	2-64mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	15
Silt	.004-0.06mm	15
Clay	<0.004mm (slick)	Ø

Physiochemical Data	
Stream Width (feet)	24.7
Wetted Stream Width (feet)	12.7
Stream Depth (feet)	0.68
pH	7.92
Temperature (°C)	2.2
Conductivity (µS)	1606
D.O.(mg/L)	13.71
Velocity (ft/sec.)	1.87
%CPOM	5%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	17
2. Epifaunal Substrate (riffle quality)	18
3. Pool Substrate Characterization	11
4. Pool Variability	2
5. Channel Alteration	15
6. Sediment Deposition	15
7. Channel Sinuosity	6
8. Channel Flow Status	19
9. Condition of Banks (both banks combined)	6
10. Bank Veg. Protection (both banks combined)	7
11. Grazing/Other Disruptive Pressure	1
12. Riparian Veg. Zone Width (both banks combined)	1
Total Score (maximum=240)	118
Total / 240 x 100 = Habitat Score	49%

% Morphology Types	
Riffle	55
Pool	5
Run	40

Habitat Sampled[1]	Number of kicks	
Cobble/Gravel	III	3
Snag	I	1
CPOM	I	1
SAV	III	3
Sand/Fine Sediment	II	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

Macros obs: tipulidae, Megaloptera, Plecoptera

Fish obs: creek chub, darter

- Both banks have high disruption due to mowed fields and driveway crossing over stream
- banks are very unstable
- sediment deep good, but could be a result of recent rain & snow melt washing out most of the fine particles
- No deep pools pres, just located above riffle
- two trips enter stream @ top & bottom of reach on LB

D	V
.18	.10
.23	2.05
.82	2.63
.91	1.49
1.10	3.33
1.05	3.86
.48	1.28
.17	.21

Investigator(s) Signature:

Revised 6/09

Sheet 1/2 Flow = 7,248.30

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation Rd #2 Stream Name: McCourtney Run

Stream ID#: 40628 Segment ID:

Station ID: MCR 1 Sample Date: 2/7/11

Sampler(s): SG MB

[X] Pre-Mining

[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count: Riffle/Run (1/2 ||||)	Particle Count: 1/2 Pool/Glide	Total
Fines	Silt/Clay	<0.062	卌 ||	|||	10
Sand	Very Fine	0.062 - 0.125	||||		4
	Fine	0.125 - 0.25	||	||	4
	Medium	0.25 - 0.50	|||		3
	Coarse	0.5 - 1.00			Ø
	Very Coarse	1.00 - 2.00	||||		4
Gravel	Very Fine	2.00 - 4.00	卌 卌 |||		13
	Fine	4.00 - 5.70	||		2
	Fine	5.70 - 8.00	|		1
	Medium	8.00 - 11.3	||		2
	Medium	11.3 - 16.0	卌 |		6
	Coarse	16.0 - 22.6	卌		5
	Coarse	22.6 - 32.0	卌 |		6
	Very Coarse	32.0 - 45.0	卌 卌		10
	Very Coarse	45.0 - 64.0	卌 ||		7
Cobble	Small	64.0 - 90.0	卌 |||		8
	Small	90.0 - 128	|||		3
	Large	128 - 180	||||		4
	Large	180 - 256	||		2
Boulder	Small	256 - 362	|||		3
	Small	362 - 512	|||		3
	Medium	512 - 1,024			Ø
	Large	1,024 - 2,048			Ø
Bedrock	Large	>2,048			Ø
		Totals:	95	5	100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: McCourtney Run 40628

Stream NHD #: 05020005000192

Sample Date: 2/7/2011

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S. Gill / M. Benson

Comments: MCR 1

Starting Lat/Long: 39° 51' 51.421" N / 80° 18' 0.236" W
Ending Lat/Long: 39° 51' 48.754" N / 80° 18' 2.075" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	3
Snag	1
Coarse Particulate Organic Matter	1
Submerged Aquatic Vegetation	3
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1- 4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		1						
Ephemeroptera		Ephemeridae		*Ephemera*	U	CG	2		1						
Plecoptera		Capniidae		*Allocapnia*	U	SH	3		4						
Plecoptera		Taeniopterygidae		*Taeniopteryx*	U	SH	2		1						
Trichoptera		Rhyacophilidae		*Rhyacophila*	U	PR	1		1						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		1						
Diptera		Chironomidae	M			CG	6	176							
Diptera		Ceratopogonidae	M			PR	6	2							
Diptera		Tipulidae		*Tipula*	*	SH	4		3						
				Total Number of Individuals:				178	12	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date: 4/20/10	
Time: 11:35 AM	
Investigator: SG RP	

Project Name/Area: Foundation (Rd. 1)	
Sample Identifier: MCR 2	

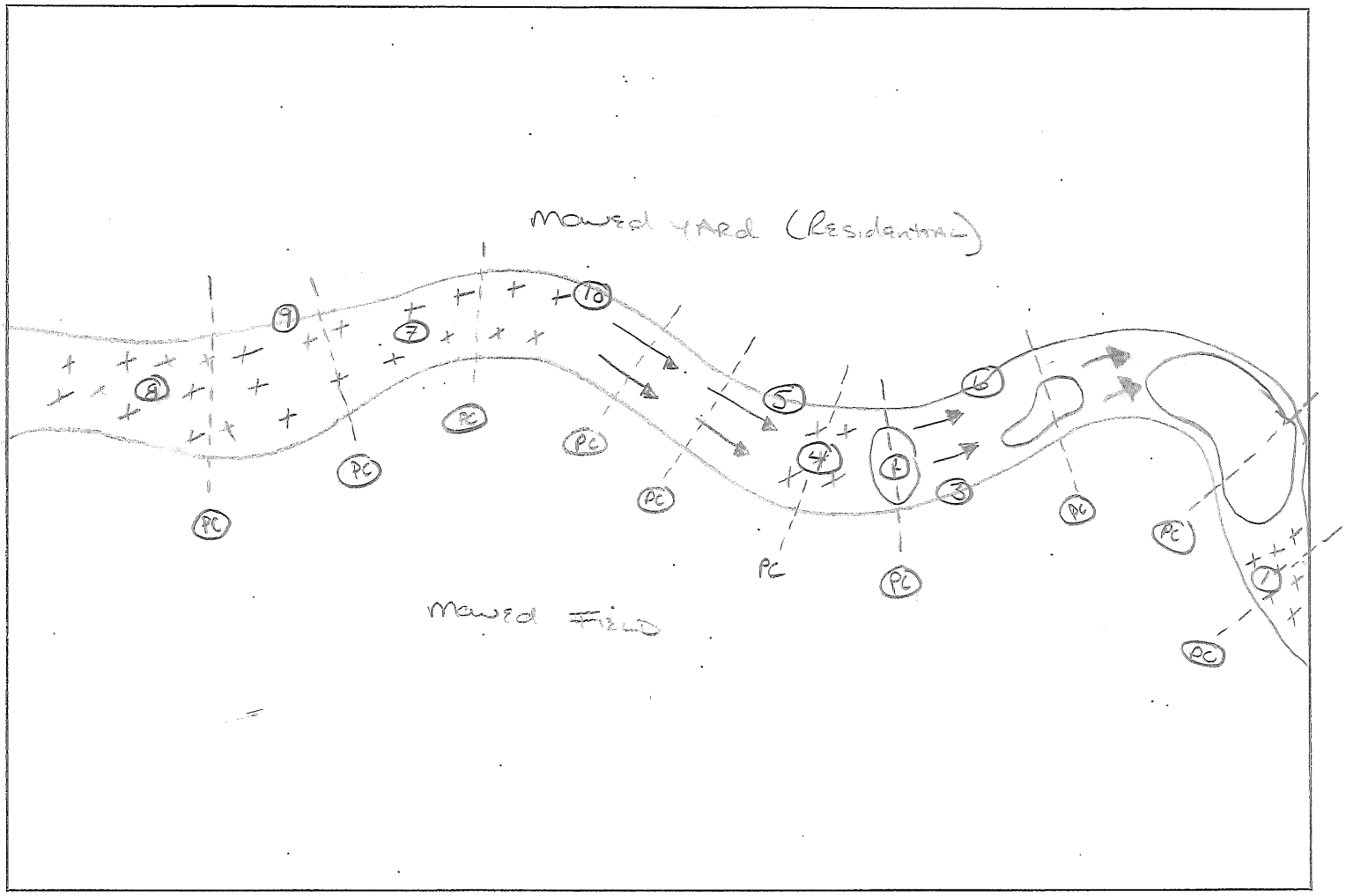
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1. C/G
2. CPOM
3. SAV
4. C/G
5. SAV
6. SFS
7. C/G
8. C/G
9. SAV
10. SFS

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation (Rd. 1)
Sample Identifier:	MCR 2
Date:	4/20/10
Time:	11:35 AM
Investigator(s):	SG RP

Latitude:	39° 51' 37.00" N
Longitude:	80° 18' 32.54" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary: ☐

Mainstem: X

Precipitation in last 7 days? Y N

Land Use (%)	
Residential	50
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Old Fields/Old Pasture	Ø
Forest	Ø
Cropland	50
Pasture	Ø
Other (explain below in notes)	Ø
Canopy Cover (%)	Ø %

Substrate Type	Diameter	% Composition
Bedrock		Ø
Boulder	>256mm (10")	10
Cobble	64-256mm (2.5"-10")	20
Gravel	2-64mm (0.1"-2.5")	30
Sand	0.06-2mm (gritty)	20
Silt	.004-0.06mm	15
Clay	<0.004mm (slick)	5

Physiochemical Data	
Stream Width (feet)	9.9
Wetted Stream Width (feet)	9.9
Stream Depth (feet)	0.44
pH	8.13
Temperature (°C)	11.3
Conductivity (µS)	217
D.O.(mg/L)	7.0
Velocity (ft/sec.)	1.09
%CPOM	10%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	19
2. Epifaunal Substrate (riffle quality)	17
3. Pool Substrate Characterization	14
4. Pool Variability	15
5. Channel Alteration	19
6. Sediment Deposition	9
7. Channel Sinuosity	6
8. Channel Flow Status	19
9. Condition of Banks (both banks combined)	6
10. Bank Veg. Protection (both banks combined)	8
11. Grazing/Other Disruptive Pressure	3
12. Riparian Veg. Zone Width (both banks combined)	1
Total Score (maximum=240)	136
Total / 240 x 100 = Habitat Score	57%

% Morphology Types	
Riffle	55
Pool	25
Run	20

Habitat Sampled[1]	Number of kicks	
Cobble/Gravel	IIII	4
Snag	Ø	Ø
CPOM	I	1
SAV	III	3
Sand/Fine Sediment	II	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

Macros obs: heptageniidae, hydropsychidae

Fish obs: Greenside darter, creek chub

Land use: RB mowed field, w/ unstable banks
LB: mowed yard w/ unstable banks

lg. deep pools w/ good fish cover.

D	V
.80	1.75
.50	1.06
.45	1.92
.25	.32
.20	.58

Flow = 2123.24 gpm

Investigator(s) Signature:

Revised 6/09

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FORM 8.10A
WOLMAN PEBBLE COUNT

7 Riffle: ~~||||~~ ||
3 Pool: |||

Mine Name: Foundation

Stream Name: McCourtney Run

Stream ID#: 40628

Segment ID:

Station ID: MCR 2

Sample Date: 4/20/10

Sampler(s): SG RP

☒ Pre-Mining ☐ Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run	Pool/Glide	
Fines	Silt/Clay	<0.062	~~||||~~ ~~||||~~	~~||||~~ ~~||||~~ ||	22
Sand	Very Fine	0.062-0.125	|||		3
	Fine	0.125 – 0.25	||	||	4
	Medium	0.25 – 0.50	||		3
	Coarse	0.05 – 1.00	||		2
	Very Coarse	1.00 – 2.00		||	3
Gravel	Very Fine	2.00 – 4.00	~~||||~~		6
	Fine	4.00 - 5.70	||		2
	Fine	5.70 - 8.00			1
	Medium	8.00 - 11.3	|||		3
	Medium	11.3 - 16.0	||||		4
	Coarse	16.0 - 22.6	||		3
	Coarse	22.6 - 32.0	||	||	4
	Very Coarse	32.0 – 45.0	|||		4
	Very Coarse	45.0 – 64.0	~~||||~~		5
Cobble	Small	64.0 - 90.0	||||		4
	Small	90.0 - 128	||||		4
	Large	128 - 180	|||		3
	Large	180 - 256	~~||||~~		6
Boulder	Small	256 - 362	|||	||	5
	Small	362 - 512	|||	||	5
	Medium	512 - 1,024		||	2
	Large	1,024 - 2,048		||	2
Bedrock	Large	>2,048			
		Totals:	70	30	

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: McCourtney Run 40628

Stream NHD #: 05020005000192

Sample Date: 4/20/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S. Gill, R. Paulenich

Comments: MCR 2

Starting Lat/Long: 39° 51' 37.716" N / 80° 18' 31.928" W
Ending Lat/Long: 39° 51' 35.519" N / 80° 18' 35.016" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	4
Snag	0
Coarse Particulate Organic Matter	1
Submerged Aquatic Vegetation	3
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Baetidae		*Baetis*	U	CG	6		2						
Ephemeroptera		Heptageniidae	U			SC	3	1							
Ephemeroptera		Ephemerellidae		*Eurylophella*	U	SC	4		1						
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		4						
Plecoptera		Nemouridae		*Amphinemura*	U	SH	3		1						
Plecoptera		Leuctridae		*Leuctra*	U	SH	0		2						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		2						
Trichoptera		Uenoidae		*Neophylax*	U	SC	3		1						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		10						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		4						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		3						
Diptera		Chironomidae	M			CG	6	128							
Diptera		Ceratopogonidae		*Probezzia*	M	PR	6		2						
Diptera		Simuliidae		*Prosimulium*	*	FC	2		14						
Diptera		Tipulidae		*Tipula*	*	SH	4		1						
Diptera		Tipulidae		*Hexatoma*	*	PR	2		2						
Bivalvia		Sphaeriidae	U			FC	8	1							
				Total Number of Individuals:				130	49	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America (*Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	2/7/11
Time:	10:30 AM
Investigator:	SG MB

Project Name/Area:	Foundation Rd. #2
Sample Identifier:	MCR 2

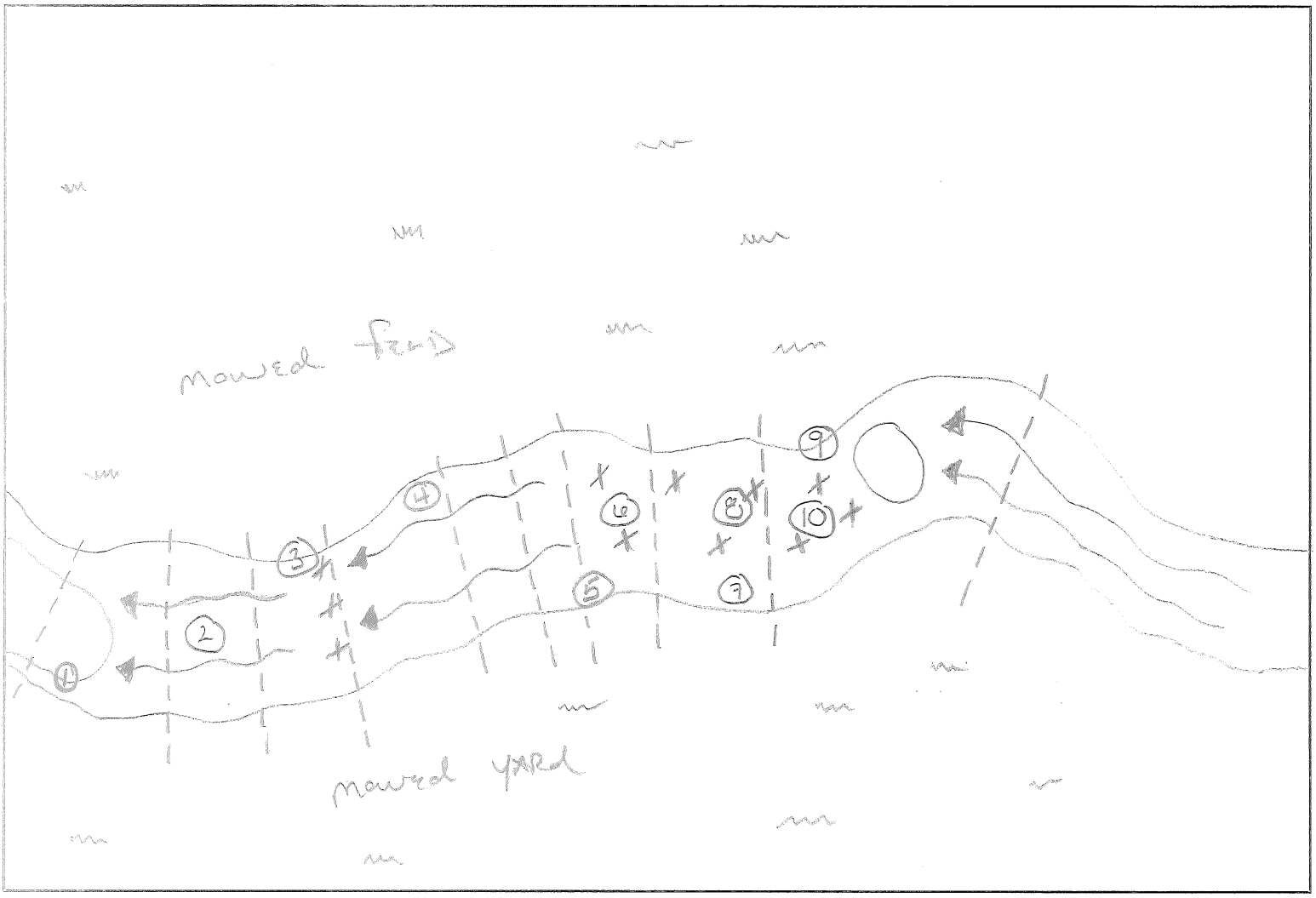
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 CPOM
2 CPOM
3 SAV
4 SFS
5 SAV
6 CIG
7 SFS
8 CIG
9 SAV
10 CIG

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd #2
Sample Identifier:	MCR 2
Date:	2/7/11
Time:	10:30 AM
Investigator(s):	SLS MB

Latitude:	39° 51' 36.80" N
Longitude:	80° 18' 33.89" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	50
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Mowed Old Fields/Old Pasture	50
Forest	Ø
Cropland	Ø
Pasture	Ø
Other (explain below in notes)	Ø
Canopy Cover (%)	0%

Substrate Type	Diameter	% Composition
Bedrock		Ø
Boulder	>256mm (10")	15
Cobble	64-256mm (2.5"-10")	30
Gravel	2-64mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	15
Silt	.004-0.06mm	5
Clay	<0.004mm (slick)	Ø

Physiochemical Data	
Stream Width (feet)	16.4
Wetted Stream Width (feet)	10.5
Stream Depth (feet)	1.03
pH	8.01
Temperature (°C)	2.5
Conductivity (µS)	169
D.O.(mg/L)	13.37
Velocity (ft/sec.)	1.39
%CPOM	15%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	16
2. Epifaunal Substrate (riffle quality)	18
3. Pool Substrate Characterization	10
4. Pool Variability	11
5. Channel Alteration	17
6. Sediment Deposition	16
7. Channel Sinuosity	6
8. Channel Flow Status	18
9. Condition of Banks (both banks combined)	5
10. Bank Veg. Protection (both banks combined)	4
11. Grazing/Other Disruptive Pressure	1
12. Riparian Veg. Zone Width (both banks combined)	1
Total Score (maximum=240)	123
Total / 240 x 100 = Habitat Score	51%

% Morphology Types	
Riffle	40
Pool	10
Run	50

Habitat Sampled[1]	Number of kicks	
Cobble/Gravel	III	3
Snag	Ø	Ø
CPOM	II	2
SAV	III	3
Sand/Fine Sediment	II	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

Macros obs: Phryganeidae, Chironomidae, Heptageniidae, Ephemeridae, Plecoptera (small)

Fish obs

- banks very unstable especially RB.
- LB mowed yard up to stream
- RB mowed old field up to stream
- one large pool @ bottom of reach
- high amounts of SAV present
- Hoges Run flows in just upstream of reach

Flow = 6747.19 gpm

D	V
.60	.41
1.13	1.70
1.20	1.95
1.28	2.58
1.25	1.62
1.25	1.11
.48	.33

Investigator(s) Signature:

Revised 6/09

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation Rd. #2
Stream Name: McCourtney Run
Stream ID#: 40028
Segment ID:
Station ID: MCR 2
Sample Date: 2/7/11
Sampler(s): SG MB

[X] Pre-Mining
[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count: Riffle/Run	Particle Count: Pool/Glide	Total
Fines	Silt/Clay	<0.062	11	~~IIII~~	7
Sand	Very Fine	0.062 - 0.125		11	2
	Fine	0.125 - 0.25	111	11	5
	Medium	0.25 - 0.50	111		3
	Coarse	0.5 - 1.00	1111		4
	Very Coarse	1.00 - 2.00	~~IIII~~ 11		7
Gravel	Very Fine	2.00 - 4.00	~~IIII~~		5
	Fine	4.00 - 5.70	111		3
	Fine	5.70 - 8.00	111		3
	Medium	8.00 - 11.3	~~IIII~~		5
	Medium	11.3 - 16.0	~~IIII~~ 111		8
	Coarse	16.0 - 22.6	~~IIII~~ 11		7
	Coarse	22.6 - 32.0	~~IIII~~ 111		8
	Very Coarse	32.0 - 45.0	~~IIII~~ 111		8
	Very Coarse	45.0 - 64.0	~~IIII~~	1	6
Cobble	Small	64.0 - 90.0	11		2
	Small	90.0 - 128	~~IIII~~		5
	Large	128 - 180	~~IIII~~ 111		8
	Large	180 - 256			0
Boulder	Small	256 - 362	1111		4
	Small	362 - 512			0
	Medium	512 - 1,024			0
	Large	1,024 - 2,048			0
Bedrock	Large	>2,048			0
		Totals:	90	10	100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: McCourtney Run 40628

Stream NHD #: 05020005000192

Sample Date: 2/7/2011

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S. Gill / M. Benson

Comments: MCR 2

Starting Lat/Long: 39° 51' 37.716" N / 80° 18' 31.928" W
Ending Lat/Long: 39° 51' 35.519" N / 80° 18' 35.016" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	3
Snag	0
Coarse Particulate Organic Matter	2
Submerged Aquatic Vegetation	3
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1- 9		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		5						
Ephemeroptera		Ephemeridae		*Ephemera*	U	CG	2		1						
Plecoptera		Capniidae	U			SH	3	3							
Plecoptera		Capniidae		*Allocapnia*	U	SH	3		24						
Plecoptera		Taeniopterygidae		*Taeniopteryx*	U	SH	2		6						
Plecoptera		Nemouridae	U			SH	2	1							
Plecoptera		Leuctridae		*Leuctra*	U	SH	0		1						
Trichoptera		Phryganeidae		*Ptilostomis*	U	SH	5		4						
Trichoptera		Limnephilidae		*Pycnopsyche*	U	SH	4		3						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		2						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		1						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		1						
Diptera		Chironomidae	M			CG	6	114							
Diptera		Ceratopogonidae	M			PR	6	5							
Diptera		Simuliidae		*Simulium*	*	FC	6		1						
Diptera		Tipulidae		*Tipula*	*	SH	4		1						
Diptera		Tipulidae		*Hexatoma*	*	PR	2		1						
Diptera		Tipulidae		*Pseudolimnophila*	*	PR	2		1						
Diptera		Tipulidae		*Erioptera*	*	CG	7		4						
Megaloptera		Sialidae		*Sialis*	U	PR	6		1						
Odonata		Gomphidae		*Gomphus*	U	PR	5		1						
				Total Number of Individuals:				123	58	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date: 4/20/10	
Time: 2:15 pm	
Investigator: SLS RP	

Project Name/Area: Foundation (Rd. 1)	
Sample Identifier: MCR 3	

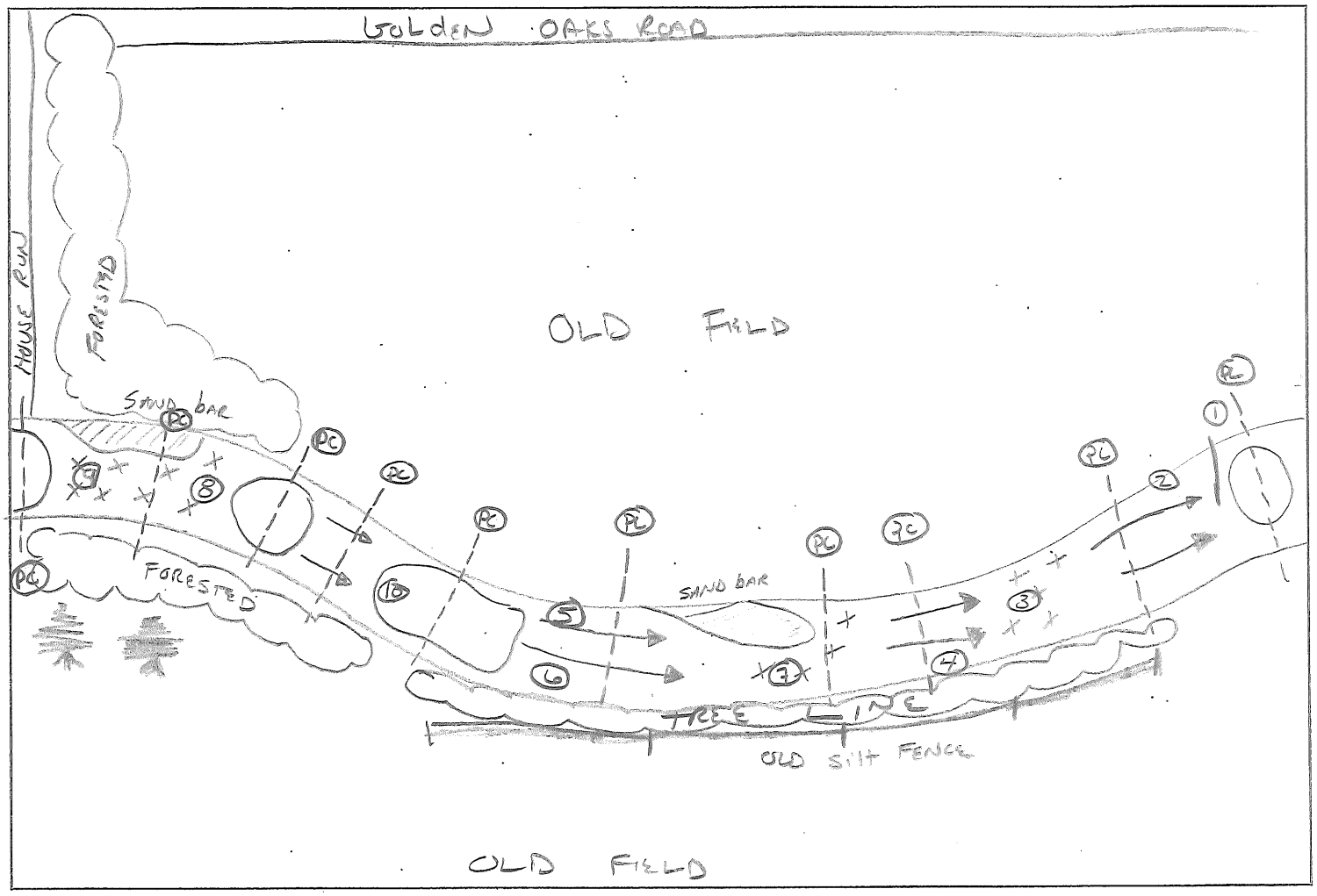
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 SNAG
2 SAV
3 CIG
4 SAV
5 CPOM
6 SFS
7 CIG
8 CIG
9 CIG
10 SFS

WPI
WALLACE & PANCHER, INC.

Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation (Rd 1)
Sample Identifier:	MCR 3
Date:	4/20/10
Time:	2:15 pm
Investigator(s):	SG RP

Latitude:	39° 51' 18.18" N
Longitude:	80° 18' 49.82"

Use Classification	
First Use	
Variable	
Diverse	X

Tributary: ☐

Mainstem: X

Precipitation in last 7 days? (Y) N

Land Use (%)	
Residential	Ø
Abandoned Mining	Ø
Active Mining/Surface Activities	Ø
Commercial/Industrial	Ø
Old Fields/Old Pasture	80
Forest	20
Cropland	Ø
Pasture	Ø
Other (explain below in notes)	Ø
Canopy Cover (%)	20%

Substrate Type	Diameter	% Composition
Bedrock		Ø
Boulder	>256mm (10")	5
Cobble	64-256mm (2.5"-10")	25
Gravel	2-64mm (0.1"-2.5")	35
Sand	0.06-2mm (gritty)	20
Silt	.004-0.06mm	10
Clay	<0.004mm (slick)	5

Physiochemical Data	
Stream Width (feet)	13.0
Wetted Stream Width (feet)	12.5
Stream Depth (feet)	0.58
pH	8.72
Temperature (°C)	13.3
Conductivity (µS)	208
D.O.(mg/L)	12.8
Velocity (ft/sec.)	0.79
%CPOM	5%
%FPOM	0%

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	18
2. Epifaunal Substrate (riffle quality)	16
3. Pool Substrate Characterization	14
4. Pool Variability	11
5. Channel Alteration	19
6. Sediment Deposition	12
7. Channel Sinuosity	4
8. Channel Flow Status	19
9. Condition of Banks (both banks combined)	11
10. Bank Veg. Protection (both banks combined)	15
11. Grazing/Other Disruptive Pressure	16
12. Riparian Veg. Zone Width (both banks combined)	12
Total Score (maximum=240)	167
Total / 240 x 100 = Habitat Score	70%

% Morphology Types	
Riffle	25
Pool	40
Run	35

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	4
Snag	1
CPOM	1
SAV	2
Sand/Fine Sediment	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

macros obs: cambaridae, Zygoptera, psphenidae, sphaeriidae

located in mostly old field habitat w/ a small tree line along RB & TREES in upper reach

lg. pools pres. w/ boulders & logs for excellent fish hab.

few sand bars pres., ones that are pres made up of large gravel & small cobble w/ some sand

Fish obs: Fantail darter

D	V
.82	.29
.70	1.0
.5	1.18
.28	.70

Flow = 2556.58 gpm

Investigator(s) Signature:

Revised 6/09

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6 Ri/Ru: ~~IIII~~ I
4 Po: III

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation

Stream Name: McCourtney Run

Stream ID#: 40628

Segment ID:

Station ID: MCR 3

Sample Date: 4/20/10

Sampler(s): SG RP

☒ Pre-Mining ☐ Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run	Pool/Glide	
Fines	Silt/Clay	<0.062	IIII	IIII	8
Sand	Very Fine	0.062-0.125	III	~~IIII~~	8
	Fine	0.125 – 0.25	II	IIII	6
	Medium	0.25 – 0.50	III	II	5
	Coarse	0.05 – 1.00	IIII	IIII	8
	Very Coarse	1.00 – 2.00	IIII	I	5
Gravel	Very Fine	2.00 – 4.00	IIII		4
	Fine	4.00 - 5.70	IIII		4
	Fine	5.70 - 8.00	I		1
	Medium	8.00 - 11.3	III	II	5
	Medium	11.3 - 16.0	IIII		4
	Coarse	16.0 - 22.6	II	I	3
	Coarse	22.6 - 32.0	~~IIII~~		5
	Very Coarse	32.0 – 45.0	~~IIII~~		5
	Very Coarse	45.0 – 64.0	I	II	3
Cobble	Small	64.0 - 90.0	III		3
	Small	90.0 - 128	IIII	II	6
	Large	128 - 180	III	III	6
	Large	180 - 256	I	II	3
Boulder	Small	256 - 362		III	3
	Small	362 - 512		II	2
	Medium	512 - 1,024		III	3
	Large	1,024 - 2,048			
Bedrock	Large	>2,048			
		Totals:	60	40	100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: McCourtney Run 40628

Stream NHD #: 05020005000193

Sample Date: 4/20/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): S. Gill, R. Paulenich

Comments: MCR 3

Starting Lat/Long: 39° 51' 19.218" N / 80° 18' 49.579" W
Ending Lat/Long: 39° 51' 16.132" N / 80° 18' 49.371" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	4
Snag	1
Coarse Particulate Organic Matter	1
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Heptageniidae		*Maccaffertium*	U	SC	3		2						
Ephemeroptera		Ephemerellidae		*Eurylophella*	U	SC	4		8						
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		2						
Plecoptera		Chloroperlidae	U			PR	0	1							
Trichoptera		Limnephilidae		*Ironoquia*	U	SH	3		2						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		3						
Trichoptera		Helicopsychidae		*Helicopsyche*	U	SC	3		3						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		20						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		2						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		3						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		1						
Diptera		Chironomidae	M			CG	6	139							
Diptera		Ceratopogonidae		*Probezzia*	M	PR	6		4						
Diptera		Simuliidae		*Simulium*	*	FC	6		13						
Diptera		Tipulidae		*Tipula*	*	SH	4		1						
Diptera		Empididae	*			PR	6	3							
Gastropoda		Physidae	U			SC	8	4							
Decapoda		Cambaridae		*Cambarus*	*	CG	6		1						
Odonata		Calopterygidae		*Calopteryx*	U	PR	6		1						
				Total Number of Individuals:				147	66	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America (*Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	11/15/10
Time:	11:30
Investigator:	AG, GM

Project Name/Area:	Foundation Rd 2
Sample Identifier:	MCR 3

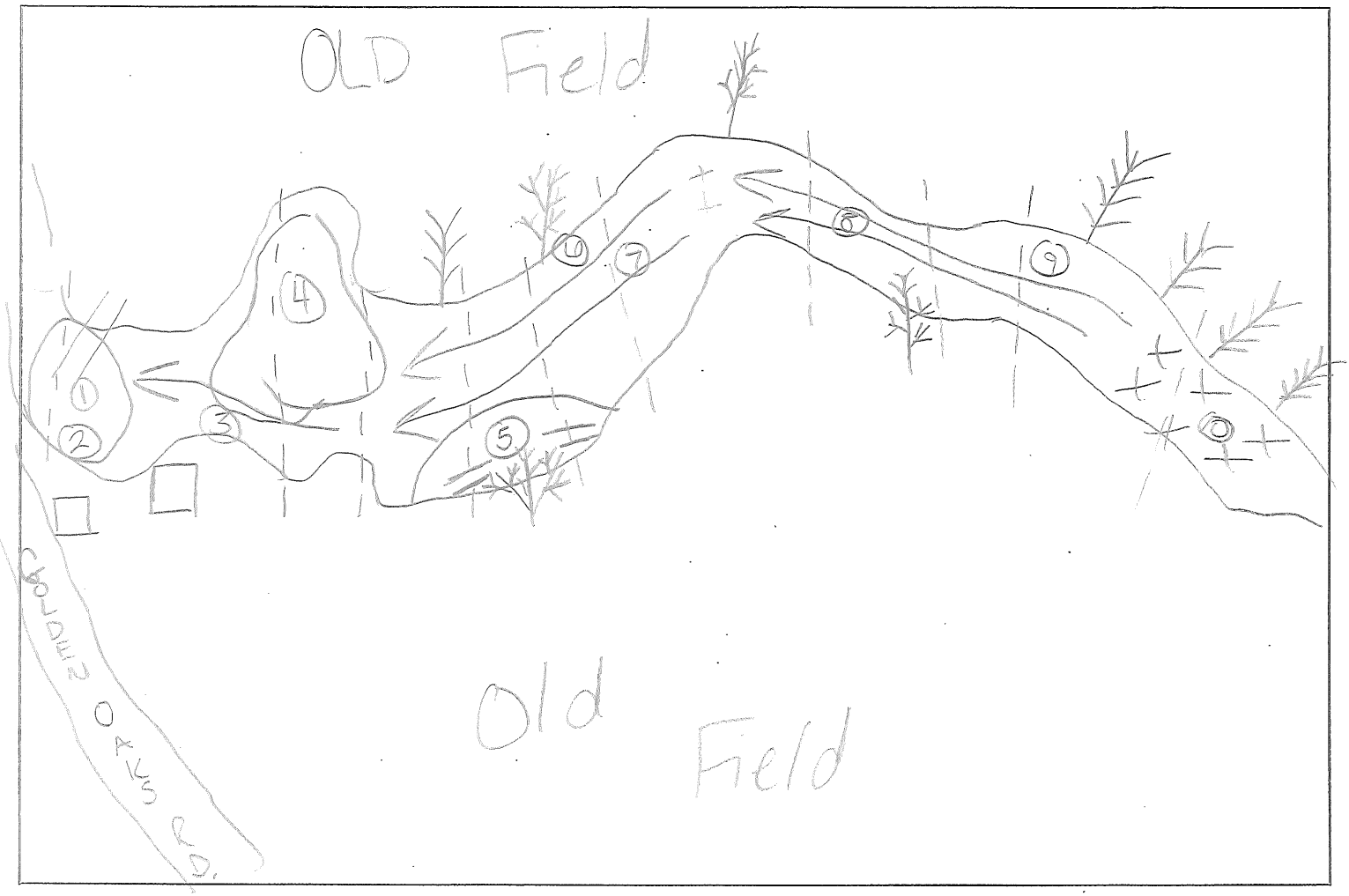
Investigator Signature: Adam Blinton

Investigator Signature: Gregory M. Moore

LEGEND

Riffle = X
Pool = 0
Run = ⟶
Snag = ═══

Indicate direction of flow with an arrow



1 Snag
2 CPOM
3 SAV
4 SFS
5 Snag
6 SAV
7 c/g
8 CPOM
9 SFS
10 c/g

: Pebble Count

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd. 2
Sample Identifier:	MCR 3
Date:	11/15/10
Time:	11:30
Investigator(s):	AG, GM

Latitude:	39° 51' 18.03"N
Longitude:	80° 18' 49.11"W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	
Mainstem:	X

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	5
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	80
Forest	15
Cropland	0
Pasture	0
Other (explain below in notes)	0
Canopy Cover (%)	5%

Substrate Type	Diameter	% Composition
Bedrock		0
Boulder	>256mm (10")	5
Cobble	64-256mm (2.5"-10")	15
Gravel	2-64mm (0.1"-2.5")	40
Sand	0.06-2mm (gritty)	25
Silt	.004-0.06mm	10
Clay	<0.004mm (slick)	5

Physiochemical Data	
Stream Width (feet)	12.5
Wetted Stream Width (feet)	9.4
Stream Depth (feet)	0.34
pH	7.34
Temperature (°C)	5.2
Conductivity (µS)	404
D.O.(mg/L)	11.8
Velocity (ft/sec.)	0.06
%CPOM	60
%FPOM	0

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	14
2. Epifaunal Substrate (riffle quality)	9
3. Pool Substrate Characterization	13
4. Pool Variability	9
5. Channel Alteration	19
6. Sediment Deposition	14
7. Channel Sinuosity	8
8. Channel Flow Status	14
9. Condition of Banks (both banks combined)	14
10. Bank Veg. Protection (both banks combined)	15
11. Grazing/Other Disruptive Pressure	14
12. Riparian Veg. Zone Width (both banks combined)	12
Total Score (maximum=240)	155
Total / 240 x 100 = Habitat Score	65%

% Morphology Types	
Riffle	10
Pool	30
Run	60

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	2
Snag	2
CPOM	2
SAV	2
Sand/Fine Sediment	2

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- Macros & Fish obs
- Riffles lacking, Majority Run

87.14 gpm

Investigator(s) Signature:

Adam Gaetano

Gregory M. Moore

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation Rd. 2

Stream Name: McCartney Run

Stream ID#: 40628

Segment ID:

Station ID: MCR 3

Sample Date: 11/15/10

Sampler(s): AG, GM

[X] Pre-Mining

[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count: Riffle/Run	Particle Count: Pool/Glide	Total
Fines	Silt/Clay	<0.062	4	3	7
Sand	Very Fine	0.062 - 0.125	4	2	6
	Fine	0.125 - 0.25	3	1	4
	Medium	0.25 - 0.50	2	1	3
	Coarse	0.5 - 1.00	4	2	6
	Very Coarse	1.00 - 2.00	5	2	7
Gravel	Very Fine	2.00 - 4.00	2	1	3
	Fine	4.00 - 5.70	1	1	2
	Fine	5.70 - 8.00	2	3	5
	Medium	8.00 - 11.3	2	3	5
	Medium	11.3 - 16.0	5	4	9
	Coarse	16.0 - 22.6	3	2	5
	Coarse	22.6 - 32.0	6	3	9
	Very Coarse	32.0 - 45.0	5	2	7
	Very Coarse	45.0 - 64.0	4		4
Cobble	Small	64.0 - 90.0	6		6
	Small	90.0 - 128	3		3
	Large	128 - 180	2		2
	Large	180 - 256	2		2
Boulder	Small	256 - 362	2		2
	Small	362 - 512	2		2
	Medium	512 - 1,024	1		1
	Large	1,024 - 2,048			
Bedrock	Large	>2,048			
		Totals:	70	30	100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: McCourtney Run 40628

Stream NHD #: 05020005000193

Sample Date: 11/15/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): A. Greathouse / G. Moore

Comments: MCR 3

Starting Lat/Long: 39° 51' 19.218" N / 80° 18' 49.579" W
Ending Lat/Long: 39° 51' 16.132" N / 80° 18' 49.371" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	2
Snag	2
Coarse Particulate Organic Matter	2
Submerged Aquatic Vegetation	2
Sand/Fine Sediment	2

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-4		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Heptageniidae	U			SC	3	1							
Ephemeroptera		Caenidae		*Caenis*	U	CG	7		13						
Plecoptera		Capniidae	U			SH	3	7							
Plecoptera		Capniidae		*Allocapnia*	U	SH	3		18						
Plecoptera		Taeniopterygidae		*Taeniopteryx*	U	SH	2		1						
Trichoptera		Phryganeidae		*Ptilostomis*	U	SH	5		1						
Trichoptera		Limnephilidae		*Pycnopsyche*	U	SH	4		3						
Trichoptera		Hydropsychidae		*Cheumatopsyche*	U	FC	6		2						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		2						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		13						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		7						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		2						
Diptera		Chironomidae	M			CG	6	114							
Diptera		Ceratopogonidae	M			PR	6	4							
Diptera		Tipulidae		*Tipula*	*	SH	4		2						
Diptera		Tipulidae		*Dicranota*	*	PR	3		5						
Diptera		Tabanidae		*Chrysops*	*	PI	7		1						
Gastropoda		Physidae	U			SC	8	3							
Gastropoda		Lymnaeidae	U			SC	7	1							
Gastropoda		Ancylidae	U			SC	7	2							
Odonata		Coenagrionidae		*Enallagma*	U	PR	8		1						
				Total Number of Individuals:				132	71	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	4-20-10
Time:	9:40 AM
Investigator:	RP SG

Project Name/Area:	Foundation Rd 1
Sample Identifier:	MCR 4

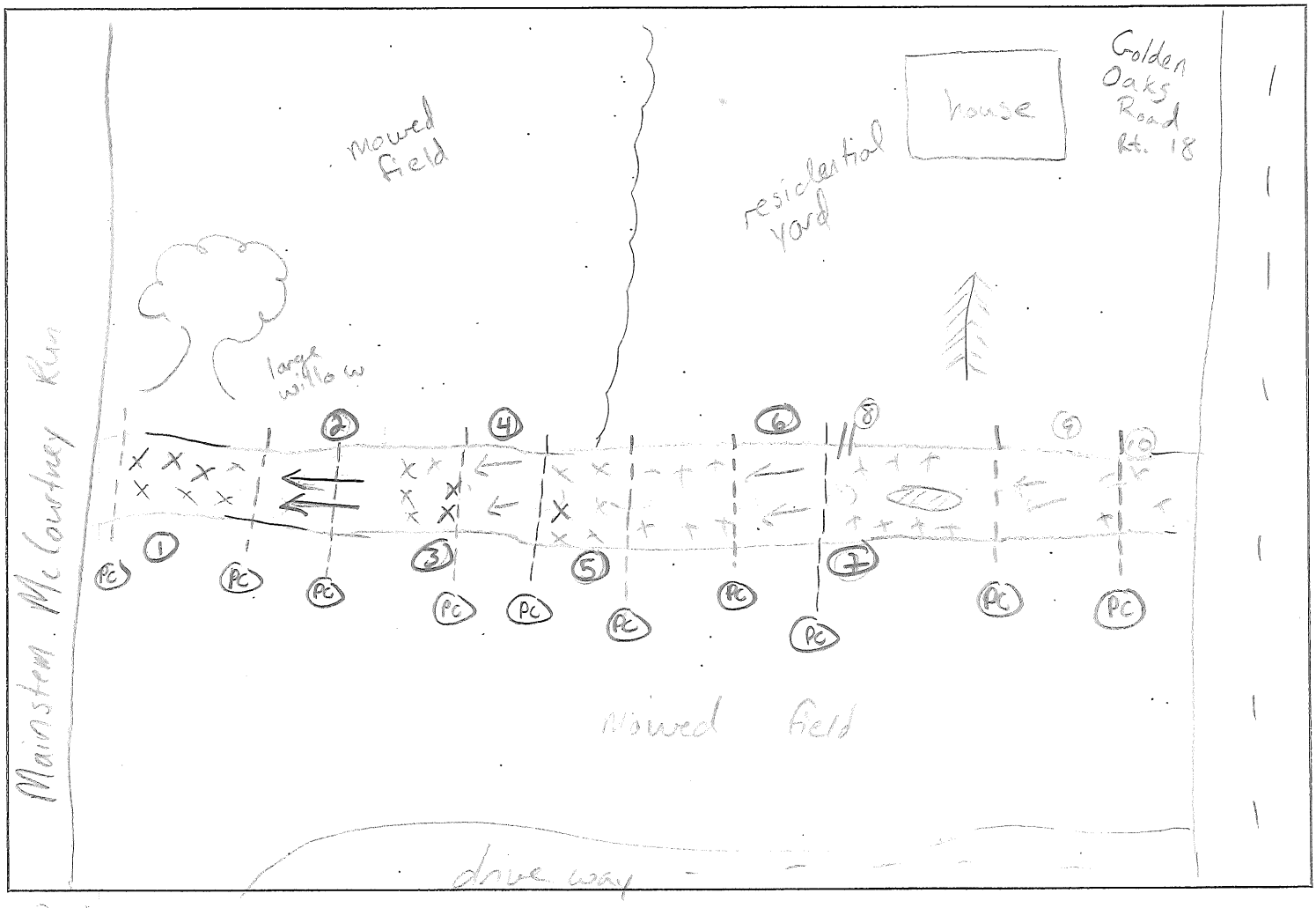
Investigator Signature

Investigator Signature

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



1 C/G
2 SAV
3 C/G
4 SAV
5 C/G
6 SAV
7 C/G
8 snag
9 SAV
10 C/G

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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd 1
Sample Identifier:	MCR 4
Date:	4-20-10
Time:	9:40 AM
Investigator(s):	RP SG

Latitude:	39° 53' 47" N
Longitude:	80° 11' 12" W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary: X

Mainstem:

Precipitation in last 7 days? (Y) N

Land Use (%)	
Residential	25
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	0
Forest	0
Cropland	0
Pasture	0
Other (explain below in notes)	75
Canopy Cover (%)	< 5 %

Substrate Type	Diameter	% Composition
Bedrock		0
Boulder	>256mm (10")	0
Cobble	64-256mm (2.5"-10")	20
Gravel	2-64mm (0.1"-2.5")	45
Sand	0.06-2mm (gritty)	10
Silt	.004-0.06mm	20
Clay	<0.004mm (slick)	5

Physiochemical Data	
Stream Width (feet)	7.1
Wetted Stream Width (feet)	2.9
Stream Depth (feet)	0.17
pH	8.27
Temperature (°C)	8.1
Conductivity (µS)	241
D.O.(mg/L)	12.7
Velocity (ft/sec.)	0.49
%CPOM	0
%FPOM	0

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	13
2. Epifaunal Substrate (riffle quality)	13
3. Pool Substrate Characterization	6
4. Pool Variability	1
5. Channel Alteration	18
6. Sediment Deposition	12
7. Channel Sinuosity	6
8. Channel Flow Status	13
9. Condition of Banks (both banks combined)	13
10. Bank Veg. Protection (both banks combined)	14
11. Grazing/Other Disruptive Pressure	16
12. Riparian Veg. Zone Width (both banks combined)	6
Total Score (maximum=240)	131
Total / 240 x 100 = Habitat Score	55 %

% Morphology Types	
Riffle	65
Pool	0
Run	35

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	~~IIII~~
Snag	I
CPOM	0
SAV	IIII
Sand/Fine Sediment	0

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

- tipulidae, hydrocidae
- Pools lacking, substrate covered in brown algae
- 75% landuse is a mowed field
- lots of terrestrial grasses submerged, sampled as SAV
- no good SFS, no CPOM

d	v
.2	.29
.21	.87
.1	.31

GPM = 108.42

Investigator(s) Signature:

Revised 6/09

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation

Stream Name: Trib to McCourtney Run

Stream ID#: 40630

Segment ID:

Station ID: MCR 4

Sample Date: 4-20-10

Sampler(s): RP SG

☒ Pre-Mining ☐ Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run	Pool/Glide	
Fines	Silt/Clay	<0.062	~~IIII~~ ~~IIII~~ ~~IIII~~		15
Sand	Very Fine	0.062-0.125	~~IIII~~ I		6
	Fine	0.125 – 0.25	~~IIII~~		5
	Medium	0.25 – 0.50	~~IIII~~		5
	Coarse	0.05 – 1.00	~~IIII~~		5
	Very Coarse	1.00 – 2.00	~~IIII~~		5
Gravel	Very Fine	2.00 – 4.00	III		3
	Fine	4.00 - 5.70	III		3
	Fine	5.70 - 8.00	~~IIII~~		5
	Medium	8.00 - 11.3	~~IIII~~ II		7
	Medium	11.3 - 16.0	~~IIII~~ III		8
	Coarse	16.0 - 22.6	~~IIII~~ ~~IIII~~ III		13
	Coarse	22.6 - 32.0	II		2
	Very Coarse	32.0 – 45.0	~~IIII~~		5
	Very Coarse	45.0 – 64.0	~~IIII~~		5
Cobble	Small	64.0 - 90.0	~~IIII~~		5
	Small	90.0 - 128	I		1
	Large	128 - 180	I		1
	Large	180 - 256	I		1
Boulder	Small	256 - 362			
	Small	362 - 512			
	Medium	512 - 1,024			
	Large	1,024 - 2,048			
Bedrock	Large	>2,048			
		Totals:			100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Trib 40630 To McCourtney Run

Stream NHD #: 05020005003454

Sample Date: 4/20/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): R. Paulenich, S. Gill

Comments: MCR 4

Starting Lat/Long: 39° 51' 51.229" N / 80° 18' 5.585" W
Ending Lat/Long: 39° 51' 49.354" N / 80° 18' 2.164" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	5
Snag	1
Coarse Particulate Organic Matter	0
Submerged Aquatic Vegetation	4
Sand/Fine Sediment	0

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (s) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-5		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Heptageniidae		*Maccaffertium*	U	SC	3		1						
Coleoptera		Elmidae		*Stenelmis*	U	SC	5		4						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		1						
Coleoptera		Psephenidae		*Psephenus*	U	SC	4		5						
Diptera		Chironomidae	M			CG	6	114							
Diptera		Ceratopogonidae		*Probezzia*	M	PR	6		4						
Diptera		Simuliidae		*Simulium*	*	FC	6		3						
Diptera		Simuliidae		*Prosimulium*	*	FC	2		4						
Diptera		Tipulidae	*			SH	4	1							
Diptera		Tipulidae		*Tipula*	*	SH	4		4						
Diptera		Tipulidae		*Hexatoma*	*	PR	2		1						
Diptera		Tabanidae	*			PI	6	1							
Diptera		Empididae	*			PR	6	1							
Gastropoda		Physidae	U			SC	8	15							
Gastropoda		Lymnaeidae	U			SC	7	74							
Decapoda		Cambaridae		*Cambarus*	*	CG	6		1						
				Total Number of Individuals:				206	28	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on the following reference: *An Introduction to the Aquatic insects of North America (*Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.

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Appendix B- Stream Habitat Field Sketch Form

Date:	12-6-10
Time:	1:00 pm
Investigator:	TMB

Project Name/Area:	Foundation RDa
Sample Identifier:	MCR4

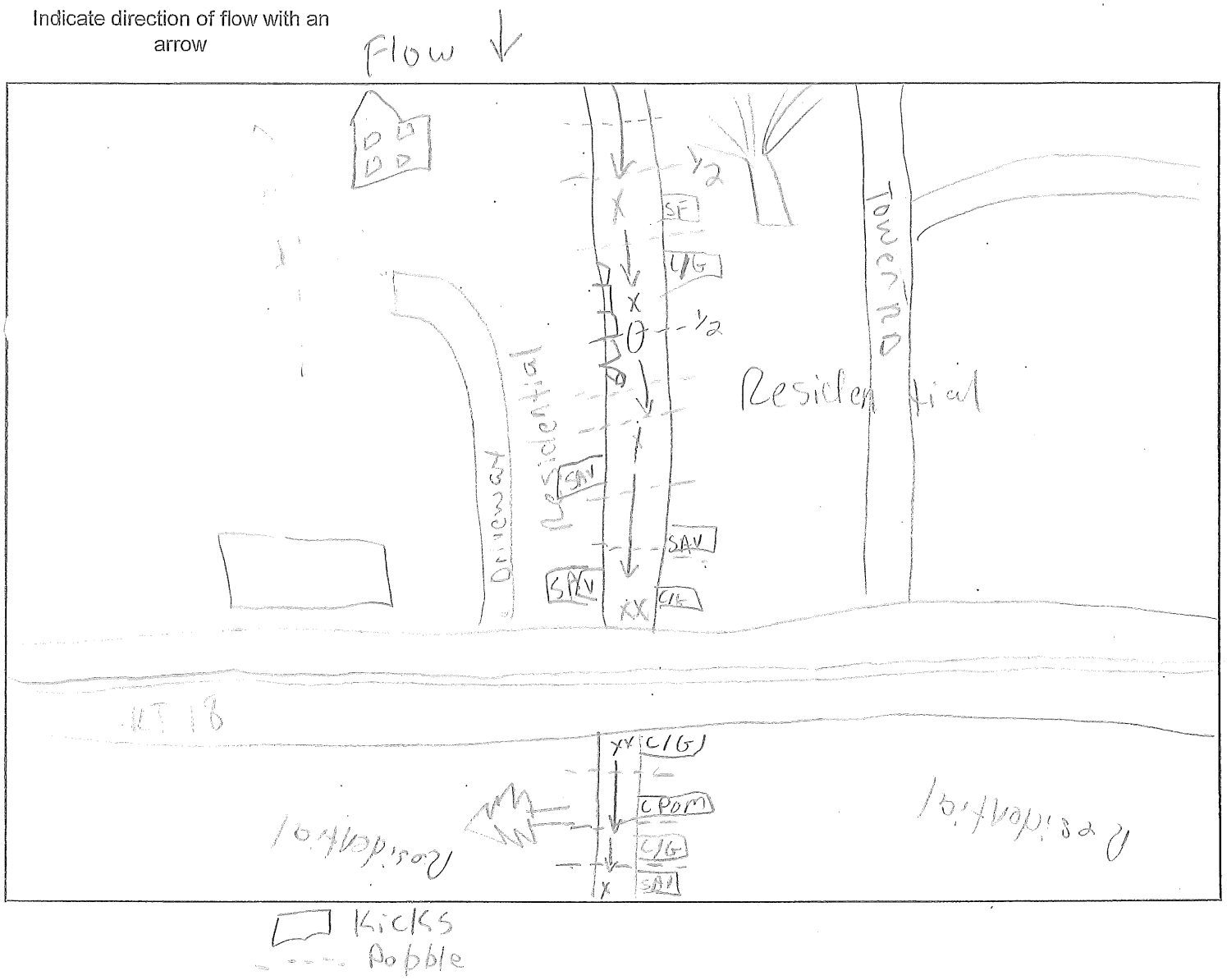
Investigator Signature: Timothy M Beller

Investigator Signature: [illegible]

LEGEND

Riffle = X
Pool = 0
Run = →
Snag = ═══

Indicate direction of flow with an arrow



WPI
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Appendix B- Low Gradient Stream Sampling Field Delineation Form

Project Name/Area:	Foundation Rd 2
Sample Identifier:	MCR4
Date:	12-6-10
Time:	1:00 pm
Investigator(s):	TM BL

Latitude:	39 51 49 791 N
Longitude:	80 18 05 147 W

Use Classification	
First Use	
Variable	
Diverse	X

Tributary:	X
Mainstem:	

Stream Augmented?	Y	(N)
Augmentation On?	Y	(N)
Precipitation in last 7 days?	(Y)	N

Land Use (%)	
Residential	100
Abandoned Mining	0
Active Mining/Surface Activities	0
Commercial/Industrial	0
Old Fields/Old Pasture	0
Forest	0
Cropland	0
Pasture	0
Other (explain below in notes)	0
Canopy Cover (%)	5

Substrate Type	Diameter	% Composition
Bedrock		—
Boulder	>256mm (10")	5
Cobble	64-256mm (2.5"-10")	20
Gravel	2-64mm (0.1"-2.5")	60
Sand	0.06-2mm (gritty)	5
Silt	.004-0.06mm	5
Clay	<0.004mm (slick)	5

Physiochemical Data	
Stream Width (feet)	2.3
Wetted Stream Width (feet)	2.3
Stream Depth (feet)	.3
pH	7.71
Temperature (°C)	3.5
Conductivity (µS)	235
D.O.(mg/L)	13.0
Velocity (ft/sec.)	.32
%CPOM	5
%FPOM	5

Habitat Assessment Parameters	Score
1. Instream Cover (fish)	8
2. Epifaunal Substrate (riffle quality)	10
3. Pool Substrate Characterization	5
4. Pool Variability	4
5. Channel Alteration	7
6. Sediment Deposition	14
7. Channel Sinuosity	3
8. Channel Flow Status	16
9. Condition of Banks (both banks combined)	10
10. Bank Veg. Protection (both banks combined)	8
11. Grazing/Other Disruptive Pressure	2
12. Riparian Veg. Zone Width (both banks combined)	2
Total Score (maximum=240)	89
Total / 240 x 100 = Habitat Score	37%

% Morphology Types	
Riffle	25
Pool	5
Run	70

Habitat Sampled[1]	Number of kicks
Cobble/Gravel	IIII
Snag	—
CPOM	I
SAV	IIII
Sand/Fine Sediment	I

[1]The 10 kicks are to be divided evenly between the different habitat types. If one or more habitats are missing, divide remaining kicks evenly between existing habitat types.

Notes:

Run along 2 Roads
All residential use
Fish obs
Few macros obs
Tiowlidae Snail
Lots of veg in channel
Sometimes Narrow in upper Reach
Salamander obs

GPM 98.07

Investigator(s) Signature:

Timothy M Neely

Revised 6/09

FORM 8.10A
WOLMAN PEBBLE COUNT

Mine Name: Foundation

Stream Name: McCourtney

Stream ID#: 40630

Segment ID:

Station ID: McR 4

Sample Date: 12-6-10

Sampler(s): TMBL

[X] Pre-Mining

[ ] Post-Mining

Particle	Description	Size (mm)	Particle Count		Total
			Riffle/Run	Pool/Glide	
Fines	Silt/Clay	<0.062	卌 ||||	||	10
Sand	Very Fine	0.062 - 0.125	||		2
	Fine	0.125 - 0.25	|||		3
	Medium	0.25 - 0.50			0
	Coarse	0.5 - 1.00			0
	Very Coarse	1.00 - 2.00			0
Gravel	Very Fine	2.00 - 4.00	卌 |		6
	Fine	4.00 - 5.70	卌 |	|||	9
	Fine	5.70 - 8.00	卌		5
	Medium	8.00 - 11.3	||||		4
	Medium	11.3 - 16.0	卌 卌		15
	Coarse	16.0 - 22.6	卌 |		6
	Coarse	22.6 - 32.0	卌		5
	Very Coarse	32.0 - 45.0	卌 |		6
	Very Coarse	45.0 - 64.0	||||		4
Cobble	Small	64.0 - 90.0	卌 ||||		9
	Small	90.0 - 128	卌 卌 |		11
	Large	128 - 180			0
	Large	180 - 256			0
Boulder	Small	256 - 362	||		2
	Small	362 - 512	|||		3
	Medium	512 - 1,024			
	Large	1,024 - 2,048			
Bedrock	Large	>2,048			
		Totals:	95	5	100

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FORM 8.8C: QUANTITATIVE MULTI-HABITAT BIOASSESSMENT OF DIVERSE COMMUNITY

Mine Name: Foundation

Stream Name: Trib 40630 To McCourtney Run

Stream NHD #: 05020005003454

Sample Date: 12/6/2010

Pre-Mining Sampling Survey: 1 or 2 (circle one)

Post-Mining Sampling Survey: 1 or 2 (circle one)

Length of Sampled Reach: 100 meters

Samplers(s): T. Meeks / B. Likar

Comments: MCR 4

Starting Lat/Long: 39° 51' 51.229" N / 80° 18' 5.585" W

Ending Lat/Long: 39° 51' 49.354" N / 80° 18' 2.164" W

Composite of 10 jabs from 10 sampling locations that effectively represents the observed habitats

	Number of Jabs
Cobble/Gravel Substrate	4
Snag	0
Coarse Particulate Organic Matter	1
Submerged Aquatic Vegetation	4
Sand/Fine Sediment	1

Class or Order: Voltine Status (M) multi, (U) uni, (S) semi		Family: Voltine Status (M) Multi, (U) uni, (S) semi		Genus		Functional Feeding Group	Pollution Tolerance Value	Enter the number of individuals for each Genus identified in the lab. (F=Family / G=Genus							
								Sub. 1-8		Sub. ___		Sub. ___		Sub. ___	
								F	G	F	G	F	G	F	G
Ephemeroptera		Ephemerellidae		*Eurylophella*	U	SC	4		1						
Plecoptera		Capniidae		*Allocapnia*	U	SH	3		35						
Plecoptera		Perlodidae	U			PR	2	3							
Plecoptera		Leuctridae		*Leuctra*	U	SH	0		1						
Trichoptera		Phryganeidae		*Ptilostomis*	U	SH	5		1						
Trichoptera		Limnephilidae		*Ironoquia*	U	SH	3		1						
Coleoptera		Elmidae		*Optioservus*	U	SC	4		2						
Coleoptera		Elmidae		*Dubiraphia*	U	SC	6		1						
Diptera		Chironomidae	M			CG	6	137							
Diptera		Simuliidae		*Prosimulium*	*	FC	2		1						
Gastropoda		Physidae	U			SC	8	2							
Gastropoda		Lymnaeidae	U			SC	7	1							
				Total Number of Individuals:				143	43	0	0	0	0	0	0

Lab sub-sample 1-4 (200 +/- 20%) (Continue to sub-sample if numbers are <160 or >240.)

* Unable to determine the voltine status based on PADEP TGD 563-2000-655, Table A.1. or An Introduction to the Aquatic Insects of North America (Merrit and Cummins, 2008) or as a result of a different voltine status for different species within the genus.