APPENDIX B:

PHASE 2 STREAM GEOMORPHIC ASSESSMENT DATA

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M02-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,807	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	6/17/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach extends from the reachpoint south of Union street upstream to the dam West of Clough Ave**

Step 5 - Notes: **Large gravel deposits were found near grade controls in the areas where the channel was less armored and has more room to widen.**

Step 7 - Narrative: **This reach was highly impacted from historic straightening and encroachment as it flows through the center of Windsor. Incision was variable but always F-type. Several grade controls reduced incision leading to widening and some deposition and gravel bar formation. The large dam and impoundment upstream is a major interruption to sediment supply, however the upper reach was bedrock controlled and did not indicate increased scour.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	85	15	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	1,815		1,501	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Hilly	Hilly
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	380
Width Determination:	Measured
Confinement Type:	NW
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	0.0	0.0	Yes	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	No	

Stream: **Mill Brook** Reach: **M02-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**65.61**	2.11 Riffle/Step Spacing:	**300 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.80**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**2.33**	Bedrock:	**0.0 %**	Bar:	**140**	**mm**
2.4 Floodprone Width (ft.):	**87.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**6.80**	Cobble:	**24.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):	**0.00**	Coarse Gravel:	**51.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**28.16**	Fine Gravel:	**17.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.33**	Sand:	**8.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**2.43**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**25**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**272.4**	**299.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**6.2**	**5.3**	Sub-dominant:	**Deciduous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Multiple**	Bank Canopy		
Lower			Revetment Length:	**1,057.1**	**737.1**	Canopy %:	**51-75**	**51-75**
Material Type:	**Boulder/Cobble**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**26-50**
Sub-Dominant	**51-100**	**0-25**
W less than 25	**101**	**1,601**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Deciduous**	**Deciduous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Residential**	**Residential**	Mass Failures		
Sub-dominant	**Commercial**	**Commercial**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M02-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**1**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**3**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:			**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):			**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	75	Yes	No	Yes	Yes	None
Other	40	Yes	No	Yes	No	Scour Above,Scour Below
Bridge	75	No	No	No	Yes	None

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**2**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**2**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**3**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,390**
Side:	**5**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**C to F**	**No**	Geomorphic Rating	**0.43**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**9**	**None**	**Yes**	Geomorphic Condition	**Fair**
Total Score		**34**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M04-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	8,067	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	6/17/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach extends from the reach point along Ascutney Street West of I-91 and extends upstream to the reach break at Brooks Rd and Sunset Ln.**

Step 5 - Notes: **Most of reach along Rt 44 was historically straightened, however much of the right bank armoring was washed out during TS Irene. Only one stretch is still straightened.**

Step 7 - Narrative: **The channel is actively aggrading with sand and gravel from upstream mass failures and erosion. Extensive bank armoring and road encroachment are limiting planform adjustment, however the failure of historic armoring on the left bank throughout the lower reach is allowing for channel widening (note: armor failure was accounted for in scoring for widening and planform). Some floodplain was accessible throughout the reach, likely a result of recent channel aggradation. This reach is transitioning from stage II to III.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	6,459	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	710		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Extr.Steep	Steep
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	290
Width Determination:	Measured
Confinement Type:	NW
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls: None

Stream: **Mill Brook** Reach: **M04-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**70.20**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.90**	2.12 Substrate Composition		Bed:	**200**	**mm**
2.3 Mean Depth (tf):	**2.11**	Bedrock:	**0.0 %**	Bar:	**120**	**mm**
2.4 Floodprone Width (ft.):	**145.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.30**	Cobble:	**27.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**47.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**33.27**	Fine Gravel:	**12.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**2.07**	Sand:	**14.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.83**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**36**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**252.0**	**324.3**	Dominant:	**Herbaceous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.1**	**7.4**	Sub-dominant:	**Shrubs/Sapling**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**831.4**	**1,274.1**	Canopy %:	**76-100**	**76-100**
Material Type:	**Mix**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**1,560**	**1,986**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Mixed Trees**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Commercial**	**Forest**	Mass Failures		
Sub-dominant	**Forest**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M04-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Old Abutment	**68**	**No**	**No**	**Yes**	**Yes**	**Deposition Above,Deposition Below**
Bridge	**110**	**No**	**No**	**No**	**Yes**	**Deposition Above**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**5**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**7**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**4**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**661**
Side:	**10**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**None**	**Yes**	Geomorphic Rating	**0.38**
7.2 Channel Aggradation		**4**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**8**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**9**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**30**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M05-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	7,170	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	6/17/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the reach break South of Sunset lane and extends upstream to the segment point upstream of Hewett Rd**

Step 5 - Notes: **Several huge depositional features were observed along this segment. The river is currently working through the T.S. Irene deposits.**

Step 7 - Narrative: **This segment and M05-B were both similarly scoured and widened during T.S. Irene. Segment B has remained plane-bed and is relatively featureless. Segment A has redeveloped some riffle-pool sequences and has some planform development. We assessed this reach as stage III due to the widened state and the large volume of flood sediments that will continue to work through the reach. Major bed aggradation in portions of the lower segment has created small areas of accessible floodplain. The reach will slowly transition to stage IV if this process continues. Evaluation of some characteristics of confined river valleys in RGA form not entirely applicable to this Bc stream type setting (i.e., step-pool systems).**

Step 1. Valley and Floodplain

1.1 Segmentation: Channel Dimensions

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

	Length (ft)	One	Height	Both	Height
Berm:	0			0	
Road:	2,884	10		0	
Railroad:	0			0	
Imp. Path:	0			0	
Dev.:	1,098			0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Extr.Steep	Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Always
Texture:	Bedrock	Bedrock

1.5 Valley Features

Valley Width (ft):	200
Width Determination:	Measured
Confinement Type:	SC
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls: None

Stream: **Mill Brook** Reach: **M05-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**74.93**	2.11 Riffle/Step Spacing:	**200 ft.**	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**2.90**	2.12 Substrate Composition			Bed:	**350**	**mm**
2.3 Mean Depth (tf):	**1.81**	Bedrock:	**0.0 %**		Bar:	**140**	**mm**
2.4 Floodprone Width (ft.):	**84.00**	Boulder:	**3.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**8.40**	Cobble:	**43.0 %**	Stream Type:	**F**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**37.0 %**	Bed Material:	**Gravel**		
2.6 Width/Depth Ratio:	**41.40**	Fine Gravel:	**8.0 %**	Subclass Slope:	**None**		
2.7 Entrenchment Ratio:	**1.12**	Sand:	**9.0 %**	Bed Form:	**Riffle-Pool**		
2.8 Incision Ratio:	**2.90**	Silt and Smaller:	**0.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:			
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**19**	Reference Bed Material:			
				Reference Subclass Slope:			
				Reference Bedform:			

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**188.2**	**1,744.4**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**6.5**	**7.4**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**191.2**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**26-50**	**26-50**
W less than 25	**658**	**171**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Coniferous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		**113.4058**
Sub-dominant	**Residential**	**Residential**	Height		**20.0**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**20.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M05-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Abundant**
4.2 Adjacent Wetlands: **Minimal**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **1**

4.5 Flow Regulation Type **None**
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs
Field Ditch: **0** Road Ditch: **1**
Other: **0** Tile Drain: **0**
Overland Flow: **0** Urb Strm Wtr Pipe: **0**
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**48**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Above,Deposition Below**
Bridge	**70**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Above,Deposition Below**
Bridge	**46**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Above,Deposition Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Mid: **3**
Point: **6**
Side: **10**
Diagonal: **3**
Delta: **0**
Island: **0**
Braiding: **0**

5.2 Other Features
Flood chutes: **1**
5.3 Steep Riffles and Head Cuts
Steep Riffles: **5**
Neck Cutoff: **0**
Avulsion: **0**
Head Cuts: **0**
Trib Rejuv.: **No**

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score: **0**
Habitat Rating: **0.00**
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type **Confined**

	Score	STD	Historic
7.1 Channel Degradation	**5**	**B to F**	**No**
7.2 Channel Aggradation	**6**	**None**	**No**
7.3 Widening Channel	**5**	**None**	**No**
7.4 Change in Planforml	**10**	**None**	**No**
Total Score	**26**		

Geomorphic Rating **0.32**
Channel Evolution Model **F**
Channel Evolution Stage **III**
Geomorphic Condition **Poor**
Stream Sensitivity **Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M05-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	5,345	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	6/18/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the segment point upstream from the Hewett road crossing and end at the segment point downstream of the Brook Rd bridge East of the intersection with Rokepa Rd.**

Step 5 - Notes: **Huge side bars were observed through much of this segment. T.S. Irene deposits filled the channel from valley wall to valley wall in several areas leading to large mass failures and further sediment inputs to the channel.**

Step 7 - Narrative: **This reach scoured and widened considerably during T.S. Irene. The channel scoured out the entire valley in several stretches and huge mass failures, bank erosion, and heavy bank scour were observed throughout the reach. Brook road closely followed the right valley through most of the reach and was completely washed out in numerous locations. This reach widened during TSI and is continuing to widen to accommodate the large volume of flood sediments working through. Historic floodplain terraces were observed through much of the reach; however these are elevated and were only partially accessed during T.S. Irene. Evaluation of some characteristics of confined river valleys in RGA form not entirely applicable to this Bc stream type setting (i.e., step-pool systems).**

Step 1. Valley and Floodplain

1.1 Segmentation: Valley Width

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	284	3	0	
Road:	0	15	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	643		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	210
Width Determination:	Measured
Confinement Type:	SC
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	3.0	2.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	5.0	2.0	No	
Ledge	Mid-segment	1.0	0.0	No	

Stream: **Mill Brook** Reach: **M05-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**76.79**	2.11 Riffle/Step Spacing:	**200 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.50**	2.12 Substrate Composition		Bed:	**600**	**mm**
2.3 Mean Depth (tf):	**1.80**	Bedrock:	**0.0 %**	Bar:	**100**	**mm**
2.4 Floodprone Width (ft.):	**79.00**	Boulder:	**11.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.05**	Cobble:	**22.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**33.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**42.66**	Fine Gravel:	**21.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.03**	Sand:	**13.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.82**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**7**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**1,502.9**	**1,291.7**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Bedrock**	**Mix**	Erosion Height (ft.):	**7.7**	**9.6**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**703.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**26-50**
W less than 25	**0**	**261**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures	**81.0779**	**482.0008**
Sub-dominant	**None**	**Residential**	Height	**8.0**	**81.0**
(Legacy)	Amount	Mean Hieght	Gullies Number	**2**	
Failures	**Multiple**	**35.6**	Gullies Length	**240**	
Gullies	**Multiple**	**6.0**			

Stream: **Mill Brook** Reach: **M05-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bedrock Outcrops	**50**	**No**	**No**	**Yes**	**Yes**	**Deposition Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**1**	Delta:	**0**	Flood chutes:	**3**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**4**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**11**	Braiding:	**0**	Steep Riffles:	**2**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**B to F**	**No**	Geomorphic Rating	**0.26**
7.2 Channel Aggradation		**5**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**4**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**7**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**21**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M05-C	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,841	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	6/18/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the segment break downstream of the Brook Rd bridge East of the intersection with Rokepa Rd.**

Step 5 - Notes: **Deposition was noticeable lower through this segment, likely due to increased channel slope and the presence of ledge along the valley walls. The Brook Road bridge listed as a constriction was destroyed during TS Irene, however it remains in the channel. The left abutment was flanked and erosion has scoured to the ledge VW.**

Step 7 - Narrative: **The bottom 600ft of the segment are located in a bedrock gorge. Above the series of grade controls the channel is encroached by a heavily armored stretch of Brook Road along the left bank, but the right bank spills on to an accessible forested floodplain. The downstream bedrock and ledge along much of the banks has likely locked the bed in place through this segment. Minor incision led us to assess the segment as stage II CEM.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	1,456	15	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		122	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Very Steep	Extr.Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Always
Texture:	Bedrock	Bedrock

1.5 Valley Features	
Valley Width (ft):	150
Width Determination:	Estimated
Confinement Type:	SC
In Rock Gorge:	Yes
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	12.0	10.0	Yes	
Ledge	Mid-segment	10.0	8.0	Yes	

Stream: **Mill Brook** Reach: **M05-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**55.55**	2.11 Riffle/Step Spacing:	**200 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**4.20**	2.12 Substrate Composition		Bed:	**550**	**mm**
2.3 Mean Depth (tf):	**2.48**	Bedrock:	**0.0 %**	Bar:	**220**	**mm**
2.4 Floodprone Width (ft.):	**118.00**	Boulder:	**44.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**6.55**	Cobble:	**42.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**6.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**22.40**	Fine Gravel:	**6.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**2.12**	Sand:	**2.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.56**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**7**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**0.0**	**207.7**	Dominant:	**Shrubs/Sapling**	**Coniferous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**0.0**	**10.0**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**458.9**	**0.0**	Canopy %:	**26-50**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**0-25**	**26-50**
W less than 25	**424**	**0**
Buffer Vegitation Type		
Dominant	**Shrubs/Sapling**	**Coniferous**
Sub-Dominant	**Herbaceous**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Commercial**	**Forest**	Mass Failures		
Sub-dominant	**Residential**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M05-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**1**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**52**	**Yes**	**Yes**	**Yes**	**Yes**	**Deposition Above,Deposition Below,Scour Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**2**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**1**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**2**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**No**	Geomorphic Rating	**0.60**
7.2 Channel Aggradation		**14**	**None**	**Yes**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**11**	**None**	**Yes**	Geomorphic Condition	**Fair**
Total Score		**48**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M06-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	6,224	Observers:	JHB, MPL, EPF
Rain:	No	Completion Date:	6/30/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the reach break Southeast of Rokepa Rd. and extends upstream to the intersection of Brownsville Rd. and Brownsville Hartland Rd.**

Step 5 - Notes:

Step 7 - Narrative: **Moderately accessible floodplain was present on at least one bank for most of this reach. The floodplain was elevated as indicated by the high incision ratio, but still accessible during larger events. Some planform adjustment was observed in the lower portion, however the banks appeared relatively stable for most of the reach and widening was minimal. This reach is likely still affected by historic straightening which has restricted widening and planform adjustment, leading to ongoing incision; we assessed this reach as stage II. Aggradation processes may be initiating after TS Irene flood and stage III adjustment processes will likely begin soon.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	669	15	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	1,317		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Hilly	Steep
Continuous w/ Bank:	Never	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	349
Width Determination:	Measured
Confinement Type:	NW
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	6.0	2.0	No	
Ledge	Mid-segment	3.0	1.0		
Dam	Mid-segment	6.0	3.0	Yes	

Stream: **Mill Brook** Reach: **M06-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**65.67**	2.11 Riffle/Step Spacing:	**235 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.80**	2.12 Substrate Composition		Bed:	**500**	**mm**
2.3 Mean Depth (tf):	**2.35**	Bedrock:	**0.0 %**	Bar:	**180**	**mm**
2.4 Floodprone Width (ft.):	**105.00**	Boulder:	**29.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**7.30**	Cobble:	**23.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**17.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**27.94**	Fine Gravel:	**11.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.60**	Sand:	**20.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.92**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**24**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**214.6**	**1,257.8**	Dominant:	**Shrubs/Sapling**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**5.1**	**5.6**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**955.7**	**169.1**	Canopy %:	**51-75**	**26-50**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**1,302**	**735**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Deciduous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Pasture**	Mass Failures	**159.8815**	**371.0857**
Sub-dominant	**Residential**	**Forest**	Height	**15.0**	**36.5**
(Legacy)	Amount	Mean Hieght	Gullies Number	**2**	
Failures	**Multiple**	**30.8**	Gullies Length	**140**	
Gullies	**Multiple**	**2.0**			

Stream: **Mill Brook** Reach: **M06-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**Small Withdrawal**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:	**Other**	Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**52**	**Yes**	**Yes**	**Yes**	**Yes**	**Deposition Above,Deposition Below**
Bridge	**76**	**Yes**	**Yes**	**Yes**	**Yes**	**Deposition Above,Deposition Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**2**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**7**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,554**
Side:	**11**	Braiding:	**0**	Steep Riffles:	**2**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**C to B**	**No**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M07-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,300	Observers:	JHB, MPL, EPF
Rain:	No	Completion Date:	6/30/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the reachbreak upstream of the intersection of Rt-44 and Brownsville-Hartland road and extends upstream to the reachbreak downstream of intersection of Harrington Rd and Rt-44**

Step 5 - Notes: **Finer sediment deposits were observed in this short segment above the concrete dam at the M06/M07 reach break.**

Step 7 - Narrative: **The left bank is encroached by development or Route 44 and armored for most of the segment. The right bank has a low and accessible wide floodplain with relatively stable banks. Sand and gravel deposition throughout the segment indicates that the downstream dam causes enough gradient change to increase fine deposition throughout the segment. This is likely controlling incision and maintaining floodplain access. We assessed the reach as stage II due to limited opportunity for widening or planform adjustment with the high degree of encroachment and armoring. The channel would likely rapidly incise if the dam failed or was removed.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	1,238	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	703		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Hilly	Steep
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	250
Width Determination:	Measured
Confinement Type:	NW
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls: **None**

Stream: **Mill Brook** Reach: **M07-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**60.53**	2.11 Riffle/Step Spacing:	**200 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.25**	2.12 Substrate Composition		Bed:	**450**	**mm**
2.3 Mean Depth (tf):	**2.34**	Bedrock:	**0.0 %**	Bar:	**150**	**mm**
2.4 Floodprone Width (ft.):	**305.00**	Boulder:	**9.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.95**	Cobble:	**54.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**23.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**25.87**	Fine Gravel:	**9.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**5.04**	Sand:	**5.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.22**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**7**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**201.2**	**136.2**	Dominant:	**Shrubs/Sapling**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**5.0**	**3.6**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**705.4**	**0.0**	Canopy %:	**76-100**	**51-75**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**0-25**	**26-50**
W less than 25	**404**	**100**
Buffer Vegitation Type		
Dominant	**Shrubs/Sapling**	**Deciduous**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Residential**	**Forest**	Mass Failures		
Sub-dominant	**Forest**	**Commercial**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M07-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions: **None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**1**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**2**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**1**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**12**	**None**	**No**	Geomorphic Rating	**0.59**
7.2 Channel Aggradation		**12**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**13**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**47**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M07-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	6,234	Observers:	JHB, MPL
Rain:	No	Completion Date:	6/30/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the reachbreak downstream of intersection of Harrington Rd and Rt-44 and extends upstream to the reachbreak upstream of the Bible Hill Rd crossing.**

Step 5 - Notes: **Large deposits of gravel and sand were observed upstream of the failing dam and grade control mid-segment. Two culverts crossing under Rt 44 had large delta bars where they entered the stream.**

Step 7 - Narrative: **This segment was deeply incised and narrow throughout. The only accessible floodplain was located in the lower portion of the segment immediately upstream of a large grade control with a breached concrete dam. Bank erosion and scour were minimal indicating no recent widening or planform adjustment. T.S. Irene caused major flood damage to adjacent properties, however no major channel adjustments are apparent. This segment was assessed as stage II.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	285	15	0	
Road:	2,333	8	874	10
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	1,612		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Steep
Continuous w/ Bank:	Never	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	340
Width Determination:	Measured
Confinement Type:	BD
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	15.0	10.0	Yes	
Ledge	Mid-segment	6.0	2.0	Yes	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	No	

Stream: **Mill Brook** Reach: **M07-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**48.64**	2.11 Riffle/Step Spacing:	**200 ft.**	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**3.60**	2.12 Substrate Composition			Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**2.96**	Bedrock:	**0.0 %**		Bar:	**N/A**	**mm**
2.4 Floodprone Width (ft.):	**62.00**	Boulder:	**7.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**8.30**	Cobble:	**48.0 %**	Stream Type:	**F**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**25.0 %**	Bed Material:	**Cobble**		
2.6 Width/Depth Ratio:	**16.43**	Fine Gravel:	**11.0 %**	Subclass Slope:	**None**		
2.7 Entrenchment Ratio:	**1.27**	Sand:	**9.0 %**	Bed Form:	**Plane Bed**		
2.8 Incision Ratio:	**2.31**	Silt and Smaller:	**0.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:			
2.10 Riffles Type:	**Eroded**	# Large Woody Debris:	**15**	Reference Bed Material:			
				Reference Subclass Slope:			
				Reference Bedform:			

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**303.8**	**204.5**	Dominant:	**Herbaceous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**5.6**	**3.0**	Sub-dominant:	**Deciduous**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Multiple**	Bank Canopy		
Lower			Revetment Length:	**925.6**	**412.1**	Canopy %:	**51-75**	**51-75**
Material Type:	**Boulder/Cobble**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**51-100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**1,702**	**773**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Deciduous**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Residential**	**Residential**	Mass Failures		**19.13965**
Sub-dominant	**Hay**	**Forest**	Height		**10.0**
(Legacy)	Amount	Mean Hieght	Gullies Number	**1**	
Failures	**One**	**10.0**	Gullies Length	**60**	
Gullies	**One**	**4.0**			

Stream: **Mill Brook** Reach: **M07-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	36	Yes	Yes	Yes	Yes	Deposition Below
Bridge	60	Yes	Yes	No	Yes	Deposition Above,Deposition Below
Old Abutment	42	No	No	Yes	Yes	None
Bridge	45	Yes	No	Yes	Yes	Deposition Above,Deposition Below

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**2**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**5**	Delta:	**2**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**2**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**158**
Side:	**5**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**C to F**	**No**	Geomorphic Rating	**0.45**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**13**	**None**	**Yes**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**11**	**None**	**Yes**	Geomorphic Condition	**Fair**
Total Score		**36**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M08-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	2,087	Observers:	JHB, MPL, EPF
Rain:	No	Completion Date:	6/30/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **Begins at the Bible Hill Rd bridge and continues upstream to the reach break Southwest of Westgate Rd.**

Step 5 - Notes: **Two large diagonal bars were soft underfoot and were likely being supplied with sand and gravel from fresh bank erosion and mass failure within the reach.**

Step 7 - Narrative: **This reach scoured down during T.S. Irene in the upper reach and widened in the lower reach where multiple grade controls limited incision. Floodplain access is very limited throughout the reach and large mass failures were observed in the areas of widening. The upper half of the reach is naturally confined and is incised. A small ~5ft wide bench is the only accessible floodplain except during the largest events. Heavy bank scour was observed through most of the reach but widening is limited by stony soils, ledge, and dense roots. We assessed the reach as stage II due to the very high primary floodplain and the low potential for widening or planform adjustment.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	1,951	13	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Very Steep	Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	140
Width Determination:	Measured
Confinement Type:	SC
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	6.0	4.0	No	
Ledge	Mid-segment	4.0	2.0	No	
Ledge	Mid-segment	4.0	2.0	No	

Stream: **Mill Brook** Reach: **M08-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**52.00**	2.11 Riffle/Step Spacing:	**240 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.00**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**2.04**	Bedrock:	**0.0 %**	Bar:	**110**	**mm**
2.4 Floodprone Width (ft.):	**69.00**	Boulder:	**16.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.00**	Cobble:	**37.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**14.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**25.49**	Fine Gravel:	**10.0 %**	Subclass Slope:	**c**	
2.7 Entrenchment Ratio:	**1.33**	Sand:	**21.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.33**	Silt and Smaller:	**2.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Eroded**	# Large Woody Debris:	**29**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**261.5**	**154.0**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.7**	**4.3**	Sub-dominant:	**Herbaceous**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**51-100**
Sub-Dominant	**51-100**	**>100**
W less than 25	**0**	**194**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Coniferous**
Sub-Dominant	**Herbaceous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		**286.733**
Sub-dominant	**Hay**	**Hay**	Height		**35.4**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**36.7**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M08-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**4**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bedrock Outcrops	50	No	No	Yes	Yes	None
Bedrock Outcrops	30	No	No	Yes	Yes	None

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**2**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**0**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**1**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**498**
Side:	**4**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**13**	**None**	**No**	Geomorphic Rating	**0.51**
7.2 Channel Aggradation		**6**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**41**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M09-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,021	Observers:	EPF
Rain:	Yes	Completion Date:	7/21/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the reach break southeast of Westgate Rd and continues upstream to the segmentation point at the Rt-44 bridge.**

Step 5 - Notes: **Historical straightening appears to be limited to the upper segment from Route 44 down to a pinch in the valley. The valley pinches naturally in the lower segment and the channel planform there was likely straight historically. Many small pieces of LWD, but overall recruitment potential very low. Channel banks are extensively armored, otherwise there would be significantly more erosion and widening (ie, channel locked into stage II). No evidence of significant overbank flow during T.S. Irene except for one bend in segment ~1,000ft downstream of Route 44.**

Step 7 - Narrative: **Extensive historic straightening and some armoring in upper segment near Route 44. Channel incised and stuck in Stage II channel evolution. Signs of bed fining from recent floods, but no evidence of a transition to aggradation process.**

Step 1. Valley and Floodplain

1.1 Segmentation:	Channel Dimensions			1.4 Adjacent Side	Left	Right	1.5 Valley Features	
1.2 Alluvial Fan:	None			Hillside Slope:	Hilly	Hilly	Valley Width (ft):	900
1.3 Corridor Encroachments:				Continuous w/ Bank:	Sometimes	Never	Width Determination:	Estimated
Length (ft)	One	Height	Both	Height	Within 1 Bankfull W:	Sometimes	Sometimes	Confinement Type:	VB
Berm:	0		0		Texture:	N.E.	N.E.	In Rock Gorge:	No
Road:	690	10	0					Human Caused Change in Valley Width?:	No
Railroad:	0		0						
Imp. Path:	0		0						
Dev.:	0		0						

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	0.0	0.0	Yes	

Stream: **Mill Brook** Reach: **M09-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**29.17**	2.11 Riffle/Step Spacing:		2.13 Average Largest Particle on	
2.2 Max Depth (ft.):	**3.80**	2.12 Substrate Composition		Bed:	**N/A**
2.3 Mean Depth (tf):	**2.90**	Bedrock:	**0.0 %**	Bar:	**N/A**
2.4 Floodprone Width (ft.):	**35.00**	Boulder:	**2.0 %**	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):	**8.10**	Cobble:	**10.0 %**	Stream Type:	**F**
Human Elev FloodPln (ft.):		Coarse Gravel:	**25.0 %**	Bed Material:	**Gravel**
2.6 Width/Depth Ratio:	**10.06**	Fine Gravel:	**24.0 %**	Subclass Slope:	**None**
2.7 Entrenchment Ratio:	**1.20**	Sand:	**35.0 %**	Bed Form:	**Plane Bed**
2.8 Incision Ratio:	**2.13**	Silt and Smaller:	**4.0 %**	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	
2.9 Sinuosity:	**Moderate**	Detritus:	**3.0 %**	Reference Stream Type:	**E**
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**57**	Reference Bed Material:	**Gravel**
				Reference Subclass Slope:	**None**
				Reference Bedform:	**Riffle-Pool**

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**219.0**	**51.4**	Dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**4.0**	**4.0**	Sub-dominant:	**Deciduous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**284.8**	**532.5**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**0-25**
Sub-Dominant	**0-25**	**None**
W less than 25	**1,030**	**2,895**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Deciduous**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Hay**	Mass Failures		
Sub-dominant	**Forest**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M09-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**1**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**32**	**Yes**	**No**	**No**	**Yes**	**Deposition Above**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**1**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**3**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,877**
Side:	**3**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**3**	**E to F**	**Yes**	Geomorphic Rating	**0.41**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**33**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M09-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	8,525	Observers:	EPF
Rain:	Yes	Completion Date:	7/21/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the segmentation point at the Rt-44 bridge and continues upstream to the reach break east of Churchill Rd.**

Step 5 - Notes: **Numerous small sand and gravel bars were observed throughout this low gradient reach. Areas without historical straightening are difficult to discern as most of reach appears to have been straightened in past. Very important flood attenuation reach for downstream areas.**

Step 7 - Narrative: **Significant historical straightening throughout segment. Majority of reach was likely armored historically. Erosion is now occurring post-T.S. Irene where armor failed. Bed aggradation has likely been occurring in recent decades and lateral channel migration is beginning. Stage III channel evolution will transition into stage IV in near future in the absence of channel management.**

Step 1. Valley and Floodplain

1.1 Segmentation: Channel Dimensions

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	786	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	207		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Hilly	Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Sand	Sand

1.5 Valley Features

Valley Width (ft):	870
Width Determination:	Estimated
Confinement Type:	VB
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls: None

Stream: **Mill Brook** Reach: **M09-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**49.00**	2.11 Riffle/Step Spacing:	**180 ft.**	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**4.10**	2.12 Substrate Composition			Bed:	**4**	**inches**
2.3 Mean Depth (tf):	**2.39**	Bedrock:	**0.0 %**		Bar:	**2.5**	**inches**
2.4 Floodprone Width (ft.):	**148.00**	Boulder:	**1.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**7.80**	Cobble:	**6.0 %**	Stream Type:	**C**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**49.0 %**	Bed Material:	**Gravel**		
2.6 Width/Depth Ratio:	**20.50**	Fine Gravel:	**10.0 %**	Subclass Slope:	**None**		
2.7 Entrenchment Ratio:	**3.02**	Sand:	**30.0 %**	Bed Form:	**Riffle-Pool**		
2.8 Incision Ratio:	**1.90**	Silt and Smaller:	**4.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**Moderate**	Detritus:	**2.0 %**	Reference Stream Type:			
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**188**	Reference Bed Material:			
				Reference Subclass Slope:			
				Reference Bedform:			

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**1,313.5**	**1,477.0**	Dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**6.7**	**6.9**	Sub-dominant:	**Deciduous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Multiple**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**1,644.2**	**957.0**	Canopy %:	**51-75**	**51-75**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**26-50**	**51-100**
W less than 25	**5,450**	**4,123**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Hay**	Mass Failures		**61.648 19**
Sub-dominant	**Forest**	**Forest**	Height		**18.0**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**18.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M09-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**7**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**56**	**Yes**	**No**	**No**	**Yes**	**Deposition Above**
Bridge	**34**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Above,Deposition Below**
Old Abutment	**36**	**Yes**	**No**	**Yes**	**Yes**	**None**
Old Abutment	**36**	**Yes**	**No**	**Yes**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**4**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**4**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**22**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**5,500**
Side:	**14**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**None**	**Yes**	Geomorphic Rating	**0.40**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**7**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**32**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M10-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,908	Observers:	JHB, MPL
Rain:	No	Completion Date:	7/1/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the reach break East of Churchill Rd and continues upstream to the reach point Southwest of Rush Meadow Rd.**

Step 5 - Notes: **No true flood chutes were observed but significant over bank spillage occurred during large storm events throughout the reach.**

Step 7 - Narrative: **The lower banks of this reach were scoured during TS Irene as indicated by the slumping banks and the scoured smooth bed profile through most of the riffle sections. We did not observe active widening; however the channel was adjusting planform and had access to a narrow floodplain throughout. The very large floodplain was typically 1ft above 2x bankfull and is only accessed during large events. The upper portion is pinched between Rt 44 and a tight right valley wall, cutting off access to a large left floodplain. The lower reach is also encroached but retains access to a large floodplain in a broad to very broad valley. We assessed the reach as stage II due to the high degree of encroachment.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	1,250	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	613		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Hilly	Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Never	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	310
Width Determination:	Measured
Confinement Type:	BD
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls: None

Stream: **Mill Brook** Reach: **M10-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**46.00**	2.11 Riffle/Step Spacing:	**150 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.50**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**1.58**	Bedrock:	**0.0 %**	Bar:	**120**	**mm**
2.4 Floodprone Width (ft.):	**92.00**	Boulder:	**7.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.50**	Cobble:	**34.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**30.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**29.11**	Fine Gravel:	**18.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**2.00**	Sand:	**11.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.80**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**16**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**140.9**	**0.0**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.5**	**0.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**228.7**	**216.0**	Canopy %:	**26-50**	**51-75**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**26-50**
Sub-Dominant	**0-25**	**>100**
W less than 25	**697**	**221**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Mixed Trees**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Residential**	**Forest**	Mass Failures		**47.91832**
Sub-dominant	**Shrubs/Sapling**	**Hay**	Height		**20.0**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**20.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M10-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**32**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Above,Deposition Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**2**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**2**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**671**
Side:	**5**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**8**	**None**	**Yes**	Geomorphic Rating	**0.44**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**9**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**35**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M11-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,980	Observers:	JHB, MPL
Rain:	No	Completion Date:	7/1/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the reach break Southwest of Rush meadow Rd and continues upstream to the reach break south of Shattuck Hill Rd.**

Step 5 - Notes:

Step 7 - Narrative: **Floodplain access was extremely limited in this reach which is continuously encroached by Rt 44 and/or development between the road and the channel. An elevated historic terrace was observed along portions of the reach, but was typically 3x bankfull height and is only accessible during the largest events. Incision appears to be historic as the substrate is very large and resistant to further scour. The reach appears to have to widened during TS Irene, scouring away lower benches. This caused a lower entrenchment ratio and departure from B to F.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	3,968	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	634		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Very Steep	Extr.Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Always
Texture:	Mixed	Bedrock

1.5 Valley Features	
Valley Width (ft):	135
Width Determination:	Measured
Confinement Type:	SC
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	5.0	2.0	No	
Ledge	Mid-segment	3.0	1.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	6.0	4.0	Yes	
Ledge	Mid-segment	3.0	1.0	No	
Ledge	Mid-segment	5.0	3.0	No	
Ledge	Mid-segment	5.0	3.0	No	
Ledge	Mid-segment	9.0	4.0	Yes	

Stream: **Mill Brook** Reach: **M11-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**52.72**	2.11 Riffle/Step Spacing:	**190 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.20**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**1.82**	Bedrock:	**0.0 %**	Bar:	**160**	**mm**
2.4 Floodprone Width (ft.):	**59.00**	Boulder:	**19.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**6.90**	Cobble:	**30.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**22.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**28.97**	Fine Gravel:	**21.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.12**	Sand:	**8.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**3.14**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**22**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**49.8**	**0.0**	Dominant:	**Shrubs/Sapling**	**Coniferous**
Material Type:	**Mix**	**Bedrock**	Erosion Height (ft.):	**2.0**	**0.0**	Sub-dominant:	**Herbaceous**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**1,458.8**	**0.0**	Canopy %:	**51-75**	**76-100**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**0-25**	**None**
W less than 25	**2,152**	**0**
Buffer Vegitation Type		
Dominant	**Shrubs/Sapling**	**Coniferous**
Sub-Dominant	**Herbaceous**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Commercial**	**Forest**	Mass Failures		**43.576 17**
Sub-dominant	**Residential**	**Shrubs/Sapling**	Height		**10.0**
(Legacy)	Amount	Mean Hieght	Gullies Number	**1**	
Failures	**One**	**10.0**	Gullies Length	**30**	
Gullies	**One**	**3.0**			

Stream: **Mill Brook** Reach: **M11-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**2**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Other	**36**	**Yes**	**No**	**Yes**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**6**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**3**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**5**	Braiding:	**1**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**B to F**	**Yes**	Geomorphic Rating	**0.39**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**8**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**31**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M12-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	778	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	7/21/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional
		Why Not Assessed:	bedrock gorge

Step 0 - Location: **This reach begins at the reach break south of Shattuck Hill Rd and continues to the segmentation point just upstream of the private bridge used by the talc mine.**

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation:	Grade Controls			1.4 Adjacent Side	Left	Right	1.5 Valley Features
1.2 Alluvial Fan:	None			Hillside Slope:	Extr.Steep	Extr.Steep	Valley Width (ft): 80
1.3 Corridor Encroachments:				Continuous w/ Bank:	Always	Always	Width Determination: Estimated
Length (ft)	One	Height	Both	Height	Within 1 Bankfull W:	Always	Always	Confinement Type: NC
Berm:	0		0		Texture:	Bedrock	Bedrock	In Rock Gorge: Yes
Road:	0		0					Human Caused Change in Valley Width?: No
Railroad:	0		0					
Imp. Path:	287	10	0					
Dev.:	193		0					

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	2.0	0.0	No	
Ledge	Mid-segment	10.0	8.0	Yes	

Stream: **Mill Brook** Reach: **M12-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	
2.2 Max Depth (ft.):	
2.3 Mean Depth (tf):	
2.4 Floodprone Width (ft.):	
2.5 Aband. Floodpn (ft.):	
Human Elev FloodPln (ft.):	
2.6 Width/Depth Ratio:	**0.00**
2.7 Entrenchment Ratio:	**0.00**
2.8 Incision Ratio:	**0.00**
Human Elevated Inc. Rat.:	**0.00**
2.9 Sinuosity:	
2.10 Riffles Type:	

2.11 Riffle/Step Spacing:	
2.12 Substrate Composition	
Bedrock:	**%**
Boulder:	**%**
Cobble:	**%**
Coarse Gravel:	**%**
Fine Gravel:	**%**
Sand:	**%**
Silt and Smaller:	**%**
Silt/Clay Present:	
Detritus:	**0.0 %**
# Large Woody Debris:	

2.13 Average Largest Particle on	
Bed:	
Bar:	
2.14 Stream Type	
Stream Type:	**A**
Bed Material:	**Boulder**
Subclass Slope:	**b**
Bed Form:	**Step-Pool**
Field Measured Slope:	
2.15 Sub-reach Stream Type	
Reference Stream Type:	**A**
Reference Bed Material:	**Boulder**
Reference Subclass Slope:	**b**
Reference Bedform:	**Step-Pool**

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture		
Upper	Left	Right
Material Type:	**Bedrock**	**Bedrock**
Consistency:	**Cohesive**	**Cohesive**
Lower		
Material Type:	**Boulder/Cobble**	**Bedrock**
Consistency:	**Cohesive**	**Cohesive**

Bank Erosion	Left	Right
Erosion Length (ft.):	**0.0**	**0.0**
Erosion Height (ft.):	**0.0**	**0.0**
Revetment Type:	**Rip-Rap**	**None**
Revetment Length:	**210.9**	**0.0**

Near Bank Vegetation Type	Left	Right
Dominant:	**Coniferous**	**Coniferous**
Sub-dominant:	**Shrubs/Sapling**	**Deciduous**
Bank Canopy		
Canopy %:	**76-100**	**76-100**
Mid-Channel Canopy:	**Closed**	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant		
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Coniferous**
Sub-Dominant	**Shrubs/Sapling**	**Mixed Trees**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Forest**	**Forest**
Sub-dominant	**None**	**None**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Mill Brook** Reach: **M12-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps: **Abundant**
4.2 Adjacent Wetlands: **None**
4.3 Flow Status: **Low**
4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type **None**
Flow Reg. Use:
Impoundments:
Impoundment Loc.:
4.6 Up/Down Strm flow reg.: **None**
(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs
Field Ditch: **0** Road Ditch: **1**
Other: **0** Tile Drain: **0**
Overland Flow: **0** Urb Strm Wtr Pipe: **0**
4.9 # of Beaver Dams: **0**
Affected Length (ft): **0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bedrock Outcrops	**18**	**Yes**	**Yes**	**Yes**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types
Mid: **1**
Point: **0**
Side: **0**
Diagonal: **0**
Delta: **0**
Island: **0**
Braiding: **0**

5.2 Other Features
Flood chutes: **0**
5.3 Steep Riffles and Head Cuts
Steep Riffles: **0**
Neck Cutoff: **0**
Avulsion: **0**
Head Cuts: **0**
Trib Rejuv.: **No**

5.4 Stream Ford or Animal Crossing: **No**
5.5 Straightening: **None**
Straightening Length (ft.): **0**
5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:
6.2 Pool Substrate:
6.3 Pool Variability:
Total Score:
Habitat Rating:
Habitat Stream Condition:

6.4 Sediment Deposition:
6.5 Channel Flow Status:
6.6 Channel Alteration:
6.7 Channel Sinuosity:

Stream Gradiant Type Left Right
6.8 Bank Stability:
6.9 Bank Vegetation Protection
6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic
7.1 Channel Degradation			
7.2 Channel Aggradation			
7.3 Widening Channel			
7.4 Change in Planforml			
Total Score			

Geomorphic Rating
Channel Evolution Model
Channel Evolution Stage
Geomorphic Condition **Good**
Stream Sensitivity

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M12-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,288	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	7/21/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the segmentation point upstream of the talc mine's private bridge southeast of their plant and continues upstream to the reach break southwest of Hurricane Hill Rd.**

Step 5 - Notes: **Numerous mid channel and diagonal bars were observed in this segment with substrate size fining downstream near the large grade control/gorge. It is likely that the downstream bridge was blocked with debris during TS Irene backing up water through much of the lower portion of the segment.**

Step 7 - Narrative: **This segment is very incised and entrenched throughout. The segment likely incised further during TS Irene and is now aggrading with large volumes of sand and gravel, especially in the lower portion. Very tall banks along the talc mine property restrict access to the floodplain even during the largest events. This section is historically straightened and was likely dredged. Banks are lower in the upper portion of the segment; however floodplain access remains minimal causing a departure from C to F. Entrenchment ratios vary from approx. 1.2 in the lower reach to 1.5 in upper reach where cross section was taken. Reach likely transitioning from stage II to III channel evolution.**

Step 1. Valley and Floodplain

1.1 Segmentation: Grade Controls

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	504	7	0	
Road:	878	10	0	
Railroad:	0		0	
Imp. Path:	713	10	0	
Dev.:	1,045		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Steep	Steep
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	300
Width Determination:	Estimated
Confinement Type:	BD
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls: None

Stream: **Mill Brook** Reach: **M12-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**39.60**	2.11 Riffle/Step Spacing:	**170 ft.**	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**2.40**	2.12 Substrate Composition			Bed:	**280**	**mm**
2.3 Mean Depth (tf):	**1.77**	Bedrock:	**0.0 %**		Bar:	**110**	**mm**
2.4 Floodprone Width (ft.):	**61.00**	Boulder:	**2.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**5.00**	Cobble:	**44.0 %**	Stream Type:	**F**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**26.0 %**	Bed Material:	**Gravel**		
2.6 Width/Depth Ratio:	**22.37**	Fine Gravel:	**17.0 %**	Subclass Slope:	**None**		
2.7 Entrenchment Ratio:	**1.54**	Sand:	**11.0 %**	Bed Form:	**Plane Bed**		
2.8 Incision Ratio:	**2.08**	Silt and Smaller:	**0.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:			
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**28**	Reference Bed Material:			
				Reference Subclass Slope:			
				Reference Bedform:			

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**144.0**	**268.7**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.5**	**4.9**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**1,125.6**	**847.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**0-25**	**51-100**
W less than 25	**960**	**427**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Mixed Trees**
Sub-Dominant	**Mixed Trees**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Commercial**	**Forest**	Mass Failures		
Sub-dominant	**Forest**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M12-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**Small Withdrawal**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:	**Other**	Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**4**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**1**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**60**	**Yes**	**No**	**No**	**Yes**	**Deposition Above,Deposition Below**
Bridge	**58**	**Yes**	**No**	**No**	**Yes**	**Deposition Above,Deposition Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**4**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**4**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**7**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,083**
Side:	**8**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**C to F**	**Yes**	Geomorphic Rating	**0.40**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**32**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M13-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	7,217	Observers:	JHB, MPL
Rain:	No	Completion Date:	7/21/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the reach break Southwest of Hurricane Hill Rd and continues upstream to the reach point South of Agony Hill Rd.**

Step 5 - Notes: **Bars were typically small except for a few large side bars upstream of grade controls.**

Step 7 - Narrative: **Most of this reach is highly encroached by Rt 106. This encroachment and heavy bank armoring has locked the channel in place leading to historic incision. We observed moderate scour along the right banks from TS Irene through most of the reach, but widening was limited by stony soils and dense roots along the bank. Side bars have formed along most of these scoured banks, indicating that aggradation is an ongoing process. Minimal floodplain access led to a stream type departure from Bc to F. We assessed the reach as stage II transitioning slowly to stage III.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	6,007	10	686	10
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	1,210		401	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Very Steep	Very Steep
Continuous w/ Bank:	Never	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	145
Width Determination:	Estimated
Confinement Type:	SC
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	6.0	4.0	Yes	
Ledge	Mid-segment	8.0	6.0	Yes	
Ledge	Mid-segment	5.0	3.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	Yes	
Ledge	Mid-segment	4.0	3.0	No	
Ledge	Mid-segment	3.0	1.0	No	
Ledge	Mid-segment	7.0	4.0	Yes	
Ledge	Mid-segment	6.0	3.0	Yes	
Ledge	Mid-segment	4.0	3.0	Yes	
Ledge	Mid-segment	4.0	2.0	No	
Ledge	Mid-segment	4.0	2.0	No	
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	6.0	4.0	No	
Ledge	Mid-segment	3.0	2.0	No	
Ledge	Mid-segment	4.0	3.0	Yes	
Ledge	Mid-segment	4.0	3.0	No	
Ledge	Mid-segment	1.0	1.0	No	
Ledge	Mid-segment	0.0	0.0	No	

Stream: **Mill Brook** Reach: **M13-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**35.60**	2.11 Riffle/Step Spacing:	**180 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.50**	2.12 Substrate Composition		Bed:	**550**	**mm**
2.3 Mean Depth (tf):	**1.75**	Bedrock:	**17.0 %**	Bar:	**220**	**mm**
2.4 Floodprone Width (ft.):	**44.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.70**	Cobble:	**28.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**24.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**20.34**	Fine Gravel:	**13.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.24**	Sand:	**13.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.28**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**25**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**108.0**	**343.5**	Dominant:	**Herbaceous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.4**	**4.4**	Sub-dominant:	**Deciduous**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**3,024.6**	**436.6**	Canopy %:	**26-50**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**>100**
Sub-Dominant	**51-100**	**0-25**
W less than 25	**2,996**	**346**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Coniferous**
Sub-Dominant	**Deciduous**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Commercial**	**Forest**	Mass Failures		
Sub-dominant	**Residential**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**1**	
Failures	**None**		Gullies Length	**3**	
Gullies	**One**	**30.0**			

Stream: **Mill Brook** Reach: **M13-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**8**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bedrock Outcrops	35	Yes	No	Yes	Yes	None
Bedrock Outcrops	30	Yes	No	No	Yes	None
Bedrock Outcrops	25	Yes	No	No	Yes	None
Bridge	58	No	No	No	Yes	Deposition Above,Deposition Below
Bedrock Outcrops	25	Yes	No	Yes	Yes	None

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**2**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:		**No**	
Mid:	**5**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:		**Straightening**	
Point:	**9**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):		**600**	
Side:	**18**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:		**Dredging**	

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**B to F**	**Yes**	Geomorphic Rating	**0.45**
7.2 Channel Aggradation		**11**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**36**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M14-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,999	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	7/22/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the reach break south of Agony Hill Rd and continues upstream to the segmentation point downstream of the Bailey's Mills Rd crossing.**

Step 5 - Notes: **Major deposition features were observed throughout this segment. Several huge and very tall side and point bars were located in the upper half of the segment. Numerous diagonal and mid channel bars indicate that a large volume of T.S. Irene gravel and sand are still working through the reach. A short stretch of the reach was straightened and armored following TS Irene along a stretch of major floodplain access over the left bank.**

Step 7 - Narrative: **This segment was highly active during TS Irene with major access to both floodplains, planform adjustments, and huge volumes of gravel/sand deposition. A large volume of floodwater spilled on the left the floodplain upstream of the undersized Agony Hill Rd arch damaging adjacent properties and structures. The channel widened considerably and is currently aggrading and adjusting planform to accommodate the large volume of gravel and sand working through the reach. We assessed this segment as somewhere between stage III and IV due to ongoing aggradation and planform adjustments.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	238	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	282		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Flat	Hilly
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	495
Width Determination:	Measured
Confinement Type:	BD
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls: **None**

Stream: **Mill Brook** Reach: **M14-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**64.50**	2.11 Riffle/Step Spacing:	**230 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.30**	2.12 Substrate Composition		Bed:	**180**	**mm**
2.3 Mean Depth (tf):	**1.07**	Bedrock:	**0.0 %**	Bar:	**150**	**mm**
2.4 Floodprone Width (ft.):	**363.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**2.80**	Cobble:	**21.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**56.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**60.28**	Fine Gravel:	**12.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**5.63**	Sand:	**11.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.22**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**17**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**717.3**	**362.7**	Dominant:	**Herbaceous**	**Deciduous**
Material Type:	**Mix**	**Sand**	Erosion Height (ft.):	**4.1**	**5.1**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**246.0**	**0.0**	Canopy %:	**26-50**	**76-100**
Material Type:	**Mix**	**Gravel**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**>100**
Sub-Dominant	**51-100**	**51-100**
W less than 25	**1,105**	**0**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Residential**	**Forest**	Mass Failures		**129.9314**
Sub-dominant	**Shrubs/Sapling**	**Shrubs/Sapling**	Height		**30.0**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**30.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M14-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**25**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Above,Deposition Below,Scour Above**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**6**	Delta:	**0**	Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:	**With Windrowing**
Point:	**4**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**348**
Side:	**6**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**13**	**None**	**No**	Geomorphic Rating	**0.39**
7.2 Channel Aggradation		**5**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**5**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**31**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M14-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,868	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	7/22/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach is bound by the segmentation points up and downstream of the Bailey's Mills Rd crossing.**

Step 5 - Notes: **Several large side bars were also present in this segment, however they appear to be more stable than downstream and are slowly vegetating.**

Step 7 - Narrative: **This segment has departed from C to F due to incision. The entrenchment ratio is close to B, however the bankfull width is well under curve width and the W/D is very low, further indicating a high degree of incision. Historic armoring and straightening have locked the channel in place and reduced floodplain access compared with segment A.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	182	4	0	
Road:	1,040	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	206		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Hilly	Hilly
Continuous w/ Bank:	Sometimes	Never
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	400
Width Determination:	Estimated
Confinement Type:	VB
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	3.0	2.0	No	

Stream: **Mill Brook** Reach: **M14-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**27.50**	2.11 Riffle/Step Spacing:	**190 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.10**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**1.61**	Bedrock:	**0.0 %**	Bar:	**250**	**mm**
2.4 Floodprone Width (ft.):	**40.00**	Boulder:	**4.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.60**	Cobble:	**47.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**23.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**17.08**	Fine Gravel:	**21.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.45**	Sand:	**5.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.19**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**3**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**125.5**	**50.4**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**7.3**	**3.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**438.6**	**573.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**26-50**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**620**	**373**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Shrubs/Sapling**
Sub-Dominant	**Mixed Trees**	**Mixed Trees**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Forest**	Mass Failures		**104.024**
Sub-dominant	**Shrubs/Sapling**	**Pasture**	Height		**15.0**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**15.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M14-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**49**	**Yes**	**No**	**No**	**Yes**	**Deposition Above,Deposition Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**2**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**2**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**361**
Side:	**7**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**C to F**	**No**	Geomorphic Rating	**0.41**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**33**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M14-C	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,631	Observers:	JHB, MPL, EPF
Rain:	Yes	Completion Date:	7/22/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the segmentation point upstream of the Bailey's Mills Rd crossing and continues to the reach break just upstream of the confluence of Bailey's Brook with the main stem.**

Step 5 - Notes: **Major gravel and cobble deposits were observed throughout the segment. The reach appears to have widened during T.S. Irene followed by major gravel deposition. The stream is still aggrading and is beginning to develop new meanders through the recent flood deposits.**

Step 7 - Narrative: **This segment had moderate to high incision throughout and had access to floodplain of variable width for most of the reach for the largest events (ie., TS Irene). Some areas had access to a 60-80ft wide forested floodplain, other areas were a 5-10 ft herbaceous bench. Our cross-selection represents an average floodplain width and height and results in a departure from C to B. The reach scoured and widened during TS Irene and currently appears to be aggrading and widening. Huge volumes of sediment are stored in the channel through T4, and will likely continue to work through this segment for a long time. We assessed the reach as stage III possibly transitioning to stage IV in the near future.**

Step 1. Valley and Floodplain

1.1 Segmentation: Grade Controls

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	2,510	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Very Steep	Hilly
Continuous w/ Bank:	Sometimes	Never
Within 1 Bankfull W:	Sometimes	Never
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	400
Width Determination:	Estimated
Confinement Type:	VB
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	2.0	1.0	Yes	
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	0.0	0.0	Yes	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	5.0	3.0	Yes	
Ledge	Mid-segment	3.0	1.0	Yes	

Stream: **Mill Brook** Reach: **M14-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**38.25**	2.11 Riffle/Step Spacing:	**200 ft.**	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**2.30**	2.12 Substrate Composition			Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**1.67**	Bedrock:	**0.0 %**		Bar:	**180**	**mm**
2.4 Floodprone Width (ft.):	**70.00**	Boulder:	**16.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**4.45**	Cobble:	**36.0 %**	Stream Type:	**B**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**20.0 %**	Bed Material:	**Cobble**		
2.6 Width/Depth Ratio:	**22.90**	Fine Gravel:	**16.0 %**	Subclass Slope:	**c**		
2.7 Entrenchment Ratio:	**1.83**	Sand:	**12.0 %**	Bed Form:	**Riffle-Pool**		
2.8 Incision Ratio:	**1.93**	Silt and Smaller:	**0.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:			
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**46**	Reference Bed Material:			
				Reference Subclass Slope:			
				Reference Bedform:			

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**492.2**	**656.1**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**3.6**	**7.0**	Sub-dominant:	**Shrubs/Sapling**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**172.6**	Canopy %:	**76-100**	**51-75**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**51-100**
Sub-Dominant	**0-25**	**26-50**
W less than 25	**141**	**219**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Deciduous**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M14-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**4**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Old Abutment	**36**	**Yes**	**No**	**No**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**3**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**3**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**2**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,436**
Side:	**11**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**8**	**C to B**	**Yes**	Geomorphic Rating	**0.36**
7.2 Channel Aggradation		**6**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**6**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**9**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**29**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M15-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	986	Observers:	JHB, MPL, EPF
Rain:	Yes	Completion Date:	7/22/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the reach break just upstream of the confluence of Bailey's Brook with the main stem and continues upstream to the segmentation point downstream of the Whitmore Rd. crossing.**

Step 5 - Notes:

Step 7 - Narrative: **This short segment flows through a nice forested floodplain with low/moderate incision. The large right floodplain is elevated and only accessible during the largest events - difficult to tell whether this is an old abandoned floodplain or a glacial-era feature. The channel has carved out several meanders with nice riffle pool sequences. We assessed this as stage V based on the assumption that the channel was likely manipulated historically given the agricultural setting in the valley.**

Step 1. Valley and Floodplain

1.1 Segmentation:	Channel Dimensions	1.4 Adjacent Side	Left	Right	1.5 Valley Features	
1.2 Alluvial Fan:	None	Hillside Slope:	Very Steep	Hilly	Valley Width (ft):	230
1.3 Corridor Encroachments:		Continuous w/ Bank:	Never	Never	Width Determination:	Measured
		Within 1 Bankfull W:	Sometimes	Never	Confinement Type:	BD
		Texture:	Mixed	Mixed	In Rock Gorge:	No
					Human Caused Change in Valley Width?:	No

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	0		0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	275		0	

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	2.0	0.0	Yes	
Ledge	Mid-segment	0.0	0.0	Yes	

Stream: **Mill Brook** Reach: **M15-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**18.50**	2.11 Riffle/Step Spacing:	**180 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.25**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**1.60**	Bedrock:	**0.0 %**	Bar:	**170**	**mm**
2.4 Floodprone Width (ft.):	**135.00**	Boulder:	**7.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.25**	Cobble:	**52.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**21.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**11.56**	Fine Gravel:	**14.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**7.30**	Sand:	**6.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.44**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**14**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**132.1**	**133.6**	Dominant:	**Coniferous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.1**	**2.6**	Sub-dominant:	**Herbaceous**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**118.6**	Canopy %:	**76-100**	**76-100**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**26-50**
Sub-Dominant	**0-25**	**51-100**
W less than 25	**32**	**127**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Hay**	Mass Failures	**59.046 16**	
Sub-dominant	**None**	**Residential**	Height	**20.0**	
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**20.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M15-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions: **None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**1**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**4**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**2**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**14**	**None**	**Yes**	Geomorphic Rating	**0.73**
7.2 Channel Aggradation		**14**	**None**	**Yes**	Channel Evolution Model	**F**
7.3 Widening Channel		**15**	**None**	**Yes**	Channel Evolution Stage	**V**
7.4 Change in Planforml		**15**	**None**	**No**	Geomorphic Condition	**Good**
Total Score		**58**			Stream Sensitivity	**Moderate**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M15-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	4,325	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	8/7/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **Begins at the segmentation point south of the Whitmore Rd crossing and continues upstream to the reach break east of the intersection of Stone Chimney Road and Mount View Drive**

Step 5 - Notes: **This segment had numerous recent small deposition features throughout. The deposits were typically very soft under foot and were likely moved and deposited during a large storm shortly before the assessment was conducted.**

Step 7 - Narrative: **This segment is historically incised due to channel straightening and armoring. The channel is currently aggrading material as seen through numerous bars, and has regained access to the previously disconnected floodplain in several locations, however access to the large floodplain remains limited. Because of the moderate incision and reduced access to the large floodplain we assessed this reach as having recently transitioned to stage III.**

Step 1. Valley and Floodplain

1.1 Segmentation:	Channel Dimensions			1.4 Adjacent Side	Left	Right	1.5 Valley Features
1.2 Alluvial Fan:	None			Hillside Slope:	Hilly	Steep	Valley Width (ft): 350
1.3 Corridor Encroachments:				Continuous w/ Bank:	Never	Sometimes	Width Determination: Measured
Length (ft)	One	Height	Both	Height	Within 1 Bankfull W:	Never	Sometimes	Confinement Type: VB
Berm:	0		0		Texture:	Mixed	Mixed	In Rock Gorge: No
Road:	0		0					Human Caused Change in Valley Width?: No
Railroad:	0		0					
Imp. Path:	0		0					
Dev.:	0		0					

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	0.0	0.0	No	

Stream: **Mill Brook** Reach: **M15-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**27.00**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**1.80**	2.12 Substrate Composition			Bed:	**300**	**mm**
2.3 Mean Depth (tf):	**1.20**	Bedrock:	**0.0 %**		Bar:	**180**	**mm**
2.4 Floodprone Width (ft.):	**42.00**	Boulder:	**7.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**2.50**	Cobble:	**43.0 %**	Stream Type:	**B**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**29.0 %**	Bed Material:	**Gravel**		
2.6 Width/Depth Ratio:	**22.50**	Fine Gravel:	**10.0 %**	Subclass Slope:	**c**		
2.7 Entrenchment Ratio:	**1.56**	Sand:	**11.0 %**	Bed Form:	**Plane Bed**		
2.8 Incision Ratio:	**1.39**	Silt and Smaller:	**0.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:			
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**26**	Reference Bed Material:			
				Reference Subclass Slope:			
				Reference Bedform:			

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**831.3**	**35.0**	Dominant:	**Herbaceous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.6**	**2.3**	Sub-dominant:	**Deciduous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Multiple**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**127.4**	**33.8**	Canopy %:	**26-50**	**76-100**
Material Type:	**Mix**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**0-25**	**51-100**
W less than 25	**1,376**	**725**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Forest**	Mass Failures		**103.9067**
Sub-dominant	**Shrubs/Sapling**	**Hay**	Height		**11.2**
(Legacy)	Amount	Mean Hieght	Gullies Number	**2**	
Failures	**Multiple**	**10.7**	Gullies Length	**82**	
Gullies	**Multiple**	**202.0**			

Stream: **Mill Brook** Reach: **M15-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**Small Withdrawal**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:	**Other**	Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**9**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Other	13	Yes	No	Yes	Yes	None
Instream Culvert	13.5	Yes	No	Yes	Yes	Deposition Above,Deposition Below
Instream Culvert	9	Yes	No	Yes	Yes	Deposition Above,Deposition Below
Bridge	30	Yes	No	No	Yes	Deposition Above,Deposition Below
Bridge	12.5	Yes	No	Yes	Yes	Deposition Above,Deposition Below

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**3**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**10**	Delta:	**0**	Flood chutes:	**3**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**4**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**2,495**
Side:	**12**	Braiding:	**0**	Steep Riffles:	**3**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**C to B**	**Yes**	Geomorphic Rating	**0.36**
7.2 Channel Aggradation		**4**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**29**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M16-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	2,413	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	8/7/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **Begins at the reach break east of the intersection of Stone Chimney Rd and Mount View Dr and continues upstream to the segmentation point northeast of the intersection of Stone Chimney Rd and Newton Rd**

Step 5 - Notes: **Post T.S. Irene cobble deposits lined most of both banks throughout the segment. A few larger side and point bars were observed above grade controls.**

Step 7 - Narrative: **This segment widened during TS Irene and is currently aggrading as flood sediments work through the channel. Moderate to high bank scour was observed along all banks that were not ledge. Numerous grade controls restrict incision and several created large areas of widening with mass failure and debris jams upstream. A small to moderate floodplain bench was accessible during moderate to large events for most of the reach. A larger glacial terrace was present for most of the reach, however it is well above even the largest flood elevations.**

Step 1. Valley and Floodplain

1.1 Segmentation:	Channel Dimensions			1.4 Adjacent Side	Left	Right	1.5 Valley Features
1.2 Alluvial Fan:	None			Hillside Slope:	Very Steep	Very Steep	Valley Width (ft): 85
1.3 Corridor Encroachments:				Continuous w/ Bank:	Never	Sometimes	Width Determination: Estimated
Length (ft)	One	Height	Both	Height	Within 1 Bankfull W:	Sometimes	Sometimes	Confinement Type: SC
Berm:	0		0		Texture:	Mixed	Mixed	In Rock Gorge: No
Road:	0		0					Human Caused Change in Valley Width?: No
Railroad:	0		0					
Imp. Path:	0		0					
Dev.:	0		0					

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	8.0	5.0	No	
Ledge	Mid-segment	3.0	1.0	No	
Ledge	Mid-segment	4.0	3.0	No	

Stream: **Mill Brook** Reach: **M16-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**26.00**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.00**	2.12 Substrate Composition		Bed:	**370**	**mm**
2.3 Mean Depth (tf):	**1.24**	Bedrock:	**0.0 %**	Bar:	**200**	**mm**
2.4 Floodprone Width (ft.):	**44.00**	Boulder:	**7.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.50**	Cobble:	**65.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**14.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**20.97**	Fine Gravel:	**9.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.69**	Sand:	**5.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.75**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**51**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**245.6**	**317.3**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.4**	**5.7**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**148.4**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Mix**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**26**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Deciduous**	**Coniferous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		
Sub-dominant	**None**	**None**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M16-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**6**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions: **None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**4**	Delta:	**0**	Flood chutes:	**4**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**2**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**6**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**13**	**None**	**Yes**	Geomorphic Rating	**0.59**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**13**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**47**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Mill Brook	SGAT Version:	4.56
Reach:	M16-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	2,616	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	8/7/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **Begins at the segmentation point northeast of the intersection of Stone Chimney Rd and Newton Rd and continues upstream to the next reach break.**

Step 5 - Notes: **Similar to segment A, we observed recent cobble deposits along the base of both banks for much of the reach. A few larger cobble bars were observed in locations where the channel widened, but most depositional features were smaller and stable. A small but active headcut was observed in the upper portion where incision was very high.**

Step 7 - Narrative: **The channel bed of this segment was scoured during TS Irene, removing lower benches. Subsequent coarse deposition has lined much of the lower banks and has filled in the widened channel. The stream is currently cutting down and further incising. The upper portion of the segment is generating large volumes of sediment where coarse deposition is pushing the channel into the opposite bank causing erosion and mass failure.**

Step 1. Valley and Floodplain

1.1 Segmentation: Channel Dimensions

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	0		0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	370
Width Determination:	Estimated
Confinement Type:	VB
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls: None

Stream: **Mill Brook** Reach: **M16-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**18.67**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.60**	2.12 Substrate Composition		Bed:	**300**	**mm**
2.3 Mean Depth (tf):	**1.32**	Bedrock:	**0.0 %**	Bar:	**150**	**mm**
2.4 Floodprone Width (ft.):	**22.00**	Boulder:	**7.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.55**	Cobble:	**55.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**14.14**	Fine Gravel:	**10.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.18**	Sand:	**1.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**2.84**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**21**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:	**None**	
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**476.1**	**650.9**	Dominant:	**Herbaceous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.5**	**4.9**	Sub-dominant:	**Deciduous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**51-75**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**874**	**410**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Deciduous**
Sub-Dominant	**Deciduous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures	**170.5255**	
Sub-dominant	**Hay**	**Residential**	Height	**30.8**	
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**31.5**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Mill Brook** Reach: **M16-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Old Abutment	**14**	**Yes**	**No**	**Yes**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**4**	Delta:	**0**	Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**6**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**1**	Straightening Length (ft.):	**787**
Side:	**5**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**C to F**	**No**	Geomorphic Rating	**0.43**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**34**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Beaver Brook	SGAT Version:	4.56
Reach:	T1.01-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	6,569	Observers:	EPF, JHB, MPL
Rain:	No	Completion Date:	7/1/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins South of the Rt-44 crossing just West of Strawberry Hill Rd and continues upstream to the reach break South of the Coon Club Rd crossing.**

Step 5 - Notes: **Reach is very long therefore numerous mid and side bars observed; however density of depositional features is very low.**

Step 7 - Narrative: **Channel appears to have incised moderately in the past but currently is in equilibrium. Bed does not appear to be vertically unstable at present and we observed minimal widening or planform adjustment. We assessed the reach as Stage II due to incision, however it is stable and could transition to Stage V over time. Areas of riparian impact and lateral instability are concentrated in the lower reach near the school, West Windsor Town Hall, and Route 44 crossing.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	150	3	0	
Road:	0		0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	597		191	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Very Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	170
Width Determination:	Measured
Confinement Type:	NW
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	1.8	0.5	No	

Stream: **Beaver Brook** Reach: **T1.01-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**28.50**	2.11 Riffle/Step Spacing:	**250 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.80**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**1.85**	Bedrock:	**0.0 %**	Bar:	**120**	**mm**
2.4 Floodprone Width (ft.):	**133.00**	Boulder:	**7.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.15**	Cobble:	**51.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**28.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**15.41**	Fine Gravel:	**10.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**4.67**	Sand:	**4.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.48**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**76**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**675.2**	**347.7**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**6.2**	**5.0**	Sub-dominant:	**Herbaceous**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Multiple**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**151.2**	**114.4**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**51-100**	**51-100**
W less than 25	**407**	**356**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures	**261.4781**	**178.4732**
Sub-dominant	**None**	**Residential**	Height	**18.4**	**15.1**
(Legacy)	Amount	Mean Hieght	Gullies Number	**1**	
Failures	**Multiple**	**17.8**	Gullies Length	**70**	
Gullies	**One**	**3.0**			

Stream: **Beaver Brook** Reach: **T1.01-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**8**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**1**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**56**	**Yes**	**No**	**No**	**Yes**	**Deposition Above,Scour Above,Scour Below**
Bridge	**22**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Below**
Bridge	**28**	**Yes**	**No**	**No**	**Yes**	**Scour Above,Scour Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**4**	Delta:	**0**	Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**8**	Island:	**1**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**4**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**Yes**	Geomorphic Rating	**0.61**
7.2 Channel Aggradation		**13**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**13**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**49**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Beaver Brook	SGAT Version:	4.56
Reach:	T1.02-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	5,171	Observers:	EPF
Rain:	No	Completion Date:	8/27/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the reach break just north of the intersection of Brownsville-Hartland and Sheddsville Rd and continues upstream to the segment break north of the intersection of Brownsville-Hartland and Hammond Hill Rd.**

Step 5 - Notes: **Some buffer impacts from adjacent development and horse farm in lower segment are impacting segment, but majority of the reach is fairly stable.**

Step 7 - Narrative: **Minor incision and some bank/valley erosion noted throughout reach. Incision may be historic, but some current day encroachments in lower and upper segment may be contributing to ongoing instability. Given grade controls and natural vegetation in corridor and LWD in channel, segment does not appear susceptible to significant instability in the near future. Entrenchment varied throughout segment with some areas of Bc geometry.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	916	8	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	1,059		168	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	130
Width Determination:	Estimated
Confinement Type:	NW
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	1.0	0.4	No	
Ledge	Mid-segment	2.0	2.1	No	

Stream: **Beaver Brook** Reach: **T1.02-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**24.11**	2.11 Riffle/Step Spacing:	**215 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.80**	2.12 Substrate Composition		Bed:	**250**	**mm**
2.3 Mean Depth (tf):	**1.26**	Bedrock:	**0.0 %**	Bar:	**90**	**mm**
2.4 Floodprone Width (ft.):	**61.00**	Boulder:	**6.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**2.40**	Cobble:	**27.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**37.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**19.13**	Fine Gravel:	**8.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**2.53**	Sand:	**21.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.33**	Silt and Smaller:	**1.0 %**	Field Measured Slope:	**1.2**	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**95**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**528.1**	**272.6**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**6.0**	**10.4**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**209.5**	Canopy %:	**76-100**	**76-100**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**51-100**
Sub-Dominant	**0-25**	**26-50**
W less than 25	**1,534**	**210**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures	**30.71964**	**41.57285**
Sub-dominant	**Residential**	**Residential**	Height	**25.0**	**12.0**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**18.5**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Beaver Brook** Reach: **T1.02-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**Small Withdrawal**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:	**Recreation**	Field Ditch:	Road Ditch:
4.3 Flow Status:	**Moderate**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**7**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Instream Culvert	**13**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Above,Scour Below**
Bridge	**15**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Above,Scour Above**
Instream Culvert	**12.6**	**Yes**	**No**	**Yes**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**0**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**18**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**8**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**13**	**None**	**No**	Geomorphic Rating	**0.63**
7.2 Channel Aggradation		**12**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**13**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**50**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Beaver Brook	SGAT Version:	4.56
Reach:	T1.02-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,114	Observers:	EPF
Rain:	No	Completion Date:	8/27/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This segment begins at the segment break north of the intersection of Brownsville-Hartland and Hammond Hill Rd and continues another 1100ft upstream to the next segment point.**

Step 5 - Notes: **Dense alder thickets throughout reach. Channel had much higher sinuosity than shown on the VHD. Ponding from beaver dams affected segment, but it was still accessible. Upstream segment severely ponded by large beaver dam.**

Step 7 - Narrative: **No evidence of channel instability; however beaver ponding made channel observations challenging in segment. Historic straightening likely given hay fields in corridor and obvious straightening in upstream segment.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	0		0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	138		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Hilly	Flat
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Never
Texture:	N.E.	N.E.

1.5 Valley Features	
Valley Width (ft):	500
Width Determination:	Estimated
Confinement Type:	VB
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls: **None**

Stream: **Beaver Brook** Reach: **T1.02-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**8.00**	2.11 Riffle/Step Spacing:		2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**3.00**	2.12 Substrate Composition			Bed:	**35**	**mm**
2.3 Mean Depth (tf):	**2.50**	Bedrock:	**0.0 %**		Bar:	**55**	**mm**
2.4 Floodprone Width (ft.):	**655.00**	Boulder:	**0.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**3.20**	Cobble:	**0.0 %**	Stream Type:	**E**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**5.0 %**	Bed Material:	**Sand**		
2.6 Width/Depth Ratio:	**3.20**	Fine Gravel:	**38.0 %**	Subclass Slope:	**None**		
2.7 Entrenchment Ratio:	**81.88**	Sand:	**51.0 %**	Bed Form:	**Riffle-Pool**		
2.8 Incision Ratio:	**1.07**	Silt and Smaller:	**6.0 %**	Field Measured Slope:			
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**High**	Detritus:	**6.0 %**	Reference Stream Type:	**E**		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**36**	Reference Bed Material:	**Sand**		
				Reference Subclass Slope:	**None**		
				Reference Bedform:	**Riffle-Pool**		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**0-25**
Sub-Dominant	**0-25**	**26-50**
W less than 25	**380**	**589**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Hay**	Mass Failures		
Sub-dominant	**Shrubs/Sapling**	**Shrubs/Sapling**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Beaver Brook** Reach: **T1.02-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Moderate**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**1**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**250**

4.8 Channel Constrictions: **None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**0**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**7**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**251**
Side:	**1**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**14**	**None**	**No**	Geomorphic Rating	**0.73**
7.2 Channel Aggradation		**15**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**16**	**None**	**No**	Channel Evolution Stage	**I**
7.4 Change in Planforml		**13**	**None**	**No**	Geomorphic Condition	**Good**
Total Score		**58**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Beaver Brook	SGAT Version:	4.56
Reach:	T1.02-C	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,437	Observers:	EPF
Rain:	Yes	Completion Date:	8/27/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional
		Why Not Assessed:	beaver dam

Step 0 - Location: **This reach is bound by the segment point to the south of the intersection of Brownsville-Hartland and Knob Hill Rd and continues upstream to the reach break before Beaver Brook crosses back under the Brownsville-Hartland Rd**

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation: **Other Reason**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	0		0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Hilly	Flat
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Never
Texture:	N.E.	N.E.

1.5 Valley Features

Valley Width (ft):	450
Width Determination:	Estimated
Confinement Type:	VB
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Stream: **Beaver Brook** Reach: **T1.02-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):		2.11 Riffle/Step Spacing:		2.13 Average Largest Particle on	
2.2 Max Depth (ft.):		2.12 Substrate Composition		Bed:	
2.3 Mean Depth (tf):		Bedrock:	%	Bar:	
2.4 Floodprone Width (ft.):		Boulder:	%	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):		Cobble:	%	Stream Type:	**E**
Human Elev FloodPln (ft.):		Coarse Gravel:	%	Bed Material:	**Sand**
2.6 Width/Depth Ratio:	**0.00**	Fine Gravel:	%	Subclass Slope:	**None**
2.7 Entrenchment Ratio:	**0.00**	Sand:	%	Bed Form:	**Riffle-Pool**
2.8 Incision Ratio:	**0.00**	Silt and Smaller:	%	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type	
2.9 Sinuosity:	**Moderate**	Detritus:	**0.0 %**	Reference Stream Type:	
2.10 Riffles Type:	**Not Evaluated**	# Large Woody Debris:		Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**0.0**	**0.0**	Dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**26-50**	**26-50**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**26-50**	**26-50**
W less than 25	**1,130**	**1,437**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Hay**	Mass Failures		
Sub-dominant	**Shrubs/Sapling**	**Shrubs/Sapling**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Beaver Brook** Reach: **T1.02-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:

4.2 Adjacent Wetlands:

4.3 Flow Status:

4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type **None**

Flow Reg. Use:

Impoundments:

Impoundment Loc.:

4.6 Up/Down Strm flow reg.: **None**

(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**

Field Ditch: Road Ditch:

Other: Tile Drain:

Overland Flow: Urb Strm Wtr Pipe:

4.9 # of Beaver Dams: **2**

Affected Length (ft): **1150**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types Diagonal:

Mid: Delta:

Point: Island:

Side: Braiding: **0**

5.2 Other Features Neck Cutoff: **0**

Flood chutes: **0** Avulsion: **0**

5.3 Steep Riffles and Head Cuts Head Cuts: **0**

Steep Riffles: **0** Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**

5.5 Straightening: **Straightening**

Straightening Length (ft.): **719**

5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:

6.2 Pool Substrate:

6.3 Pool Variability:

Total Score:

Habitat Rating:

Habitat Stream Condition:

6.4 Sediment Deposition:

6.5 Channel Flow Status:

6.6 Channel Alteration:

6.7 Channel Sinuosity:

Stream Gradiant Type Left Right

6.8 Bank Stability:

6.9 Bank Vegetation Protection

6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic
7.1 Channel Degradation			
7.2 Channel Aggradation			
7.3 Widening Channel			
7.4 Change in Planforml			
Total Score			

Geomorphic Rating

Channel Evolution Model

Channel Evolution Stage

Geomorphic Condition **Fair**

Stream Sensitivity

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Willow Brook	SGAT Version:	4.56
Reach:	T2.01-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	2,527	Observers:	JHB, MPL, EPF
Rain:	No	Completion Date:	8/20/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **Begins at the reach break southeast of the intersection of Churchill Rd and Rt-44 and continues upstream to the segmentation point to the east of Rush Meadow Rd before the stream crosses under the road.**

Step 5 - Notes:

Step 7 - Narrative: **This segment is straightened through most of the horse pasture and as a result is narrow and deeply incised. The reach is either a very incised and narrow C-type or a highly straightened E-type by reference. Based on channel slope and the lack of obvious historic channel indicators in the meadow, we selected a C to F departure. The entrenchment ratio is slightly above the range for F-type, however this segment is approximately 30% under curve width. This segment is stuck in stage II with minimal access to the large floodplain except during larger events.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	364	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	280		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Flat	Hilly
Continuous w/ Bank:	Sometimes	Never
Within 1 Bankfull W:	Sometimes	Never
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	600
Width Determination:	Measured
Confinement Type:	VB
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	0.0	0.0	No	

Stream: **Willow Brook** Reach: **T2.01-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**19.50**	2.11 Riffle/Step Spacing:	**110 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.35**	2.12 Substrate Composition		Bed:	**280**	**mm**
2.3 Mean Depth (tf):	**1.75**	Bedrock:	**0.0 %**	Bar:	**40**	**mm**
2.4 Floodprone Width (ft.):	**29.00**	Boulder:	**4.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**5.35**	Cobble:	**43.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**37.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**11.14**	Fine Gravel:	**9.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.49**	Sand:	**7.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**2.28**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**7.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**14**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**68.3**	**53.4**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.6**	**3.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Multiple**	Bank Canopy		
Lower			Revetment Length:	**174.1**	**946.4**	Canopy %:	**26-50**	**26-50**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**0-25**
Sub-Dominant	**>100**	**26-50**
W less than 25	**1,322**	**2,061**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Pasture**	Mass Failures		
Sub-dominant	**Shrubs/Sapling**	**Shrubs/Sapling**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Willow Brook** Reach: **T2.01-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Old Abutment	12	Yes	No	Yes	Yes	None
Other	18	No	No	Yes	Yes	None
Bridge	15	Yes	No	Yes	Yes	Deposition Above,Scour Above

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**0**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**2**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,308**
Side:	**8**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**C to F**	**No**	Geomorphic Rating	**0.45**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**36**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Willow Brook	SGAT Version:	4.56
Reach:	T2.01-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,500	Observers:	JHB, MPL
Rain:	No	Completion Date:	8/20/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This segment begins at the segmentation point downstream or the Rush Meadow Rd crossing and continues upstream to the reach break south of the intersection of West Rowe Hill Rd and Rush Meadow Rd**

Step 5 - Notes:

Step 7 - Narrative: **This segment had moderate floodplain access throughout and appeared to be fairly stable. We assessed the reach as stage IV as there was no evidence of ongoing incision or widening, and aggrading materials were causing some planform adjustments in the middle and lower portion of the segment.**

Step 1. Valley and Floodplain

1.1 Segmentation:	Channel Dimensions				1.4 Adjacent Side	Left	Right	1.5 Valley Features
1.2 Alluvial Fan:	None				Hillside Slope:	Very Steep	Hilly	Valley Width (ft): 160
1.3 Corridor Encroachments:					Continuous w/ Bank:	Sometimes	Never	Width Determination: Estimated
Length (ft)	One	Height	Both	Height	Within 1 Bankfull W:	Always	Never	Confinement Type: NW
Berm:	0		0		Texture:	Bedrock	Mixed	In Rock Gorge: No
Road:	677	10	0					Human Caused Change in Valley Width?: Yes
Railroad:	0		0					
Imp. Path:	0		0					
Dev.:	200		0					

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	4.0	2.0	Yes	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	4.0	2.0	No	

Stream: **Willow Brook** Reach: **T2.01-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**28.23**	2.11 Riffle/Step Spacing:	**110 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.90**	2.12 Substrate Composition		Bed:	**280**	**mm**
2.3 Mean Depth (tf):	**1.35**	Bedrock:	**0.0 %**	Bar:	**150**	**mm**
2.4 Floodprone Width (ft.):	**80.00**	Boulder:	**9.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**2.75**	Cobble:	**38.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**23.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**20.91**	Fine Gravel:	**20.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**2.83**	Sand:	**10.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.45**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**18**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**163.0**	**77.5**	Dominant:	**Deciduous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**8.6**	**1.6**	Sub-dominant:	**Herbaceous**	**Deciduous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**152.8**	**240.1**	Canopy %:	**76-100**	**51-75**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**26-50**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**709**	**682**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Deciduous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Pasture**	Mass Failures		
Sub-dominant	**Hay**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Willow Brook** Reach: **T2.01-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**1**	Road Ditch:	**0**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**20**	**Yes**	**No**	**Yes**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**2**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**1**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**4**	Braiding:	**0**	Steep Riffles:	**2**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**No**	Geomorphic Rating	**0.57**
7.2 Channel Aggradation		**11**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**	**None**	**No**	Channel Evolution Stage	**IV**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**46**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Willow Brook	SGAT Version:	4.56
Reach:	T2.02-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,213	Observers:	JHB, MPL
Rain:	No	Completion Date:	8/20/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach follows Rush Meadow Rd. and is bound by the two reach breaks south of West Rowe Hill Rd.**

Step 5 - Notes: **Most bars were small and comprised of gravel. A few large cobble MCBs were observed in short areas of widening channel.**

Step 7 - Narrative: **This reach widened during TS Irene scouring away low banks and then aggraded with larger cobbles and boulders. Currently the channel is continuing to aggrade with finer material and is beginning to adjust planform through the recent deposits. We observed evidence of continued widening and assessed the reach as stage III, likely to transition to stage IV in the future. Numerous grade controls limit incision and floodplain access was moderate throughout the reach.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	3,159	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Very Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Always
Texture:	Cobble	Gravel

1.5 Valley Features	
Valley Width (ft):	100
Width Determination:	Estimated
Confinement Type:	SC
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	5.0	2.0	Yes	
Ledge	Mid-segment	3.0	1.0	No	
Ledge	Mid-segment	6.0	4.0	Yes	
Ledge	Mid-segment	4.0	2.0	Yes	
Ledge	Mid-segment	11.0	8.0	Yes	
Ledge	Mid-segment	4.0	3.0	Yes	

Stream: **Willow Brook** Reach: **T2.02-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**29.61**	2.11 Riffle/Step Spacing:	**170 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.60**	2.12 Substrate Composition		Bed:	**450**	**mm**
2.3 Mean Depth (tf):	**1.07**	Bedrock:	**2.0 %**	Bar:	**N/A**	**mm**
2.4 Floodprone Width (ft.):	**47.00**	Boulder:	**11.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**2.90**	Cobble:	**31.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**35.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**27.67**	Fine Gravel:	**10.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.59**	Sand:	**11.0 %**	Bed Form:	**Step-Pool**	
2.8 Incision Ratio:	**1.81**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**28**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**97.0**	**386.2**	Dominant:	**Deciduous**	**Coniferous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**5.4**	**2.2**	Sub-dominant:	**Shrubs/Sapling**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**843.6**	**262.6**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Bedrock**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**>100**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**588**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures		**404.1534**
Sub-dominant	**Commercial**	**Residential**	Height		**27.7**
(Legacy)	Amount	Mean Hieght	Gullies Number	**1**	
Failures	**Multiple**	**23.3**	Gullies Length	**80**	
Gullies	**One**	**5.0**			

Stream: **Willow Brook** Reach: **T2.02-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**2**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**5**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Instream Culvert	**11**	**Yes**	**No**	**Yes**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**3**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**13**	Delta:	**0**	Flood chutes:	**3**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**4**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**8**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**None**	**No**	Geomorphic Rating	**0.41**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**7**	**None**	**No**	Channel Evolution Stage	**III**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**33**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Willow Brook	SGAT Version:	4.56
Reach:	T2.03-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	2,412	Observers:	JHB, MPL
Rain:	No	Completion Date:	8/20/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This segment begins at the reach break south of the intersection of West Rowe Hill and Rush Meadow Rd and continues upstream to the segmentation point south of the intersection of Banister and Rush Meadow Road**

Step 5 - Notes:

Step 7 - Narrative: **The first 1000ft of segment A were very similar to T2.02 (widening and aggrading B-type) and should be considered a part of that reach. The portion of segment A represented by our cross-section begins immediately downstream of the Rush Meadow Ln bridge and continues upstream to the segment break. This E-type segment had an active beaver dam impounding the upper half. Moderate/high incision was observed below the beaver dam. Slumping banks and point bar development indicate that planform is slowly adjusting. We assessed the reach as stage II but transitioning towards aggradation and planform adjustment. The stream bottom was primarily cobble and was stable.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	1,698	8	282	8
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	123		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Hilly	Flat
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Sometimes	Never
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	200
Width Determination:	Estimated
Confinement Type:	BD
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	0.0	0.0	Yes	
Ledge	Mid-segment	5.0	3.0	Yes	
Ledge	Mid-segment	7.0	5.0	Yes	
Ledge	Mid-segment	3.0	2.0	Yes	

Stream: **Willow Brook** Reach: **T2.03-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**17.50**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.25**	2.12 Substrate Composition		Bed:	**220**	**mm**
2.3 Mean Depth (tf):	**1.55**	Bedrock:	**0.0 %**	Bar:	**80**	**mm**
2.4 Floodprone Width (ft.):	**160.00**	Boulder:	**7.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.75**	Cobble:	**46.0 %**	Stream Type:	**E**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**22.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**11.29**	Fine Gravel:	**17.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**9.14**	Sand:	**8.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.67**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Moderate**	Detritus:	**5.0 %**	Reference Stream Type:	**E**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**13**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:	**None**	
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**233.3**	**286.6**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.6**	**3.4**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**167.9**	**23.3**	Canopy %:	**51-75**	**26-50**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**0-25**	**>100**
W less than 25	**517**	**1,126**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Shrubs/Sapling**	**Pasture**
Sub-dominant	**Forest**	**Shrubs/Sapling**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Willow Brook** Reach: **T2.03-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**1**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**370**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**14**	**Yes**	**No**	**Yes**	**Yes**	**None**
Bridge	**13.5**	**Yes**	**No**	**No**	**No**	**Deposition Below**
Bedrock Outcrops	**18**	**Yes**	**No**	**Yes**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**5**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**2**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**531**
Side:	**6**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**10**	**None**	**Yes**	Geomorphic Rating	**0.57**
7.2 Channel Aggradation		**12**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**13**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**11**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**46**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Willow Brook	SGAT Version:	4.56
Reach:	T2.03-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	4,406	Observers:	JHB, MPL
Rain:	No	Completion Date:	8/20/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the segmentation point south of the intersection of Rush Meadow and Banister Road and continues to the reach break just upstream of where the stream crosses from the east to west side of Rush Meadow Road**

Step 5 - Notes:

Step 7 - Narrative: **Width and slope were variable through this segment, incision and entrenchment were consistently high. The lower segment was impacted by armoring on one or both banks, the upper segment typically had ledge along the left bank and tall bank armoring to Rush Meadow Road on the right bank. A large avulsion was observed mid segment in an area with less entrenchment. Overall this reach is stuck in stage II and due to natural or man-made hard banks it will likely remain there.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	4,406	8	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	523		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Sometimes
Texture:	Gravel	Gravel

1.5 Valley Features	
Valley Width (ft):	100
Width Determination:	Estimated
Confinement Type:	SC
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	4.0	0.0	No	
Ledge	Mid-segment	15.5	13.5	Yes	
Ledge	Mid-segment	0.0	0.0	No	

Stream: **Willow Brook** Reach: **T2.03-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**22.18**	2.11 Riffle/Step Spacing:	**140 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.90**	2.12 Substrate Composition		Bed:	**500**	**mm**
2.3 Mean Depth (tf):	**1.41**	Bedrock:	**0.0 %**	Bar:	**190**	**mm**
2.4 Floodprone Width (ft.):	**25.00**	Boulder:	**6.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.05**	Cobble:	**44.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**15.73**	Fine Gravel:	**21.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.13**	Sand:	**8.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**2.13**	Silt and Smaller:	**3.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**29**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**263.3**	**217.9**	Dominant:	**Coniferous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**8.1**	**2.7**	Sub-dominant:	**Herbaceous**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**703.5**	**1,059.7**	Canopy %:	**51-75**	**51-75**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**51-100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**1,285**	**2,130**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Mixed Trees**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Residential**	Mass Failures	**101.8959**	**114.7468**
Sub-dominant	**None**	**Pasture**	Height	**18.4**	**22.3**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**17.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Willow Brook** Reach: **T2.03-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**Small Withdrawal**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:	**Other**	Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Old Abutment	16	Yes	No	No	Yes	None
Bridge	11.5	Yes	No	Yes	Yes	Scour Below,Alignment
Bridge	18	Yes	Yes	No	Yes	Deposition Above
Instream Culvert	8.5	Yes	No	Yes	Yes	Scour Below
Bedrock Outcrops	18	No	No	Yes	Yes	None

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**4**	Delta:	**0**	Flood chutes:	**2**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**0**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**394**
Side:	**6**	Braiding:	**0**	Steep Riffles:	**2**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**B to F**	**Yes**	Geomorphic Rating	**0.38**
7.2 Channel Aggradation		**8**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**30**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Willow Brook	SGAT Version:	4.56
Reach:	T2.04-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,051	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	8/21/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach parallels Rush Meadow Rd to the east, and is bound by the two reach breaks south of Delano Rd.**

Step 5 - Notes:

Step 7 - Narrative: **This reach was heavily scoured and widened during TS Irene. A low and accessible forested floodplain was present along one bank for most of the reach and was heavily accessed during TSI and other recent high flows. Numerous areas of floodplain access and deposition and a recent channel avulsion were also observed. The channel is currently aggrading and adjusting planform.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	872	8	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	416		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Very Steep	Extr.Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Always
Texture:	Gravel	Gravel

1.5 Valley Features	
Valley Width (ft):	150
Width Determination:	Estimated
Confinement Type:	BD
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	1.0	0.0	No	

Stream: **Willow Brook** Reach: **T2.04-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**23.16**	2.11 Riffle/Step Spacing:	**180 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.30**	2.12 Substrate Composition		Bed:	**500**	**mm**
2.3 Mean Depth (tf):	**1.27**	Bedrock:	**0.0 %**	Bar:	**230**	**mm**
2.4 Floodprone Width (ft.):	**65.00**	Boulder:	**17.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.55**	Cobble:	**36.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**27.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**18.24**	Fine Gravel:	**5.0 %**	Subclass Slope:	**b**	
2.7 Entrenchment Ratio:	**2.81**	Sand:	**10.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.54**	Silt and Smaller:	**5.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**59**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**447.5**	**456.3**	Dominant:	**Coniferous**	**Coniferous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.3**	**3.7**	Sub-dominant:	**Shrubs/Sapling**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**24.1**	**216.4**	Canopy %:	**76-100**	**76-100**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**51-100**
W less than 25	**220**	**230**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Coniferous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures	**18.08607**	**258.8208**
Sub-dominant	**Residential**	**Residential**	Height	**10.0**	**17.6**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**15.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Willow Brook** Reach: **T2.04-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**6**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions: **None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**5**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**1**	5.5 Straightening:	**None**
Point:	**0**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**8**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**12**	**None**	**Yes**	Geomorphic Rating	**0.49**
7.2 Channel Aggradation		**9**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**IV**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**39**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Willow Brook	SGAT Version:	4.56
Reach:	T2.05-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,049	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	8/21/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **Begins at the reach break southeast of the intersection of Rush Meadow and Delano Rd and continues upstream to the segmentation point at the Rush Meadow Rd crossing**

Step 5 - Notes: **Pebble count indicates bedrock as the dominant substrate type, but cobble is likely the dominant substrate size throughout the reach. The best riffle for a cross-section happened to be in an area with more bedrock along the banks. Sensitivity will be assessed as a C3.**

Step 7 - Narrative: **This short segment had numerous bedrock grade controls and the majority of the bed was underlain with ledge. The segment widened in several locations during TS Irene leading to some erosion and a large mass failure at the bottom of the segment. The channel has since filled back in with developing side bars and appears to be slowly adjusting planform in areas with less bedrock. We assessed this reach as stage IIb due to some widening and planform adjustments and limited incision due to numerous grade controls.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	557	8	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	88		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Extr.Steep
Continuous w/ Bank:	Never	Sometimes
Within 1 Bankfull W:	Sometimes	Always
Texture:	Mixed	Gravel

1.5 Valley Features	
Valley Width (ft):	120
Width Determination:	Estimated
Confinement Type:	BD
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	9.0	6.0	Yes	
Ledge	Mid-segment	5.0	3.0	No	
Ledge	Mid-segment	4.0	2.0	Yes	
Ledge	Mid-segment	3.0	2.0	Yes	
Ledge	Mid-segment	5.0	3.0	Yes	

Stream: **Willow Brook** Reach: **T2.05-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**15.60**	2.11 Riffle/Step Spacing:	**100 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.65**	2.12 Substrate Composition		Bed:	**430**	**mm**
2.3 Mean Depth (tf):	**1.17**	Bedrock:	**50.0 %**	Bar:	**180**	**mm**
2.4 Floodprone Width (ft.):	**40.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**2.15**	Cobble:	**11.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Bedrock**	
2.6 Width/Depth Ratio:	**13.33**	Fine Gravel:	**5.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**2.56**	Sand:	**11.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.30**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**29**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**34.6**	**76.7**	Dominant:	**Herbaceous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**4.4**	**3.4**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**31.0**	**103.1**	Canopy %:	**51-75**	**76-100**
Material Type:	**Gravel**	**Bedrock**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**51-100**
Sub-Dominant	**0-25**	**>100**
W less than 25	**849**	**0**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Shrubs/Sapling**	**Forest**	Mass Failures		**73.30665**
Sub-dominant	**Hay**	**Commercial**	Height		**27.1**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**25.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Willow Brook** Reach: **T2.05-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**5**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Old Abutment	**13**	**Yes**	**No**	**Yes**	**Yes**	**None**
Bridge	**10**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Above,Deposition Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**3**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**0**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**5**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**14**	**None**	**No**	Geomorphic Rating	**0.65**
7.2 Channel Aggradation		**13**	**None**	**No**	Channel Evolution Model	**D**
7.3 Widening Channel		**13**	**None**	**No**	Channel Evolution Stage	**IIb**
7.4 Change in Planforml		**12**	**None**	**No**	Geomorphic Condition	**Good**
Total Score		**52**			Stream Sensitivity	**Moderate**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Willow Brook	SGAT Version:	4.56
Reach:	T2.05-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	939	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	8/21/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This segment begins at the segmentation point at the rush meadow road crossing and continues upstream to reach break about 250 upstream of the second Rush Meadow Rd crossing.**

Step 5 - Notes:

Step 7 - Narrative: **This short segment is E-type by reference and had moderate incision. We did not observe any evidence of widening or planform adjustment, therefore we assessed this segment as Stage II. The short stretch upstream of the Rush Meadow bridge is highly encroached by the road and is departed to F-type.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	939	8	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	183		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Hilly	Hilly
Continuous w/ Bank:	Never	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	180
Width Determination:	Estimated
Confinement Type:	VB
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	9.0	6.0	No	
Ledge	Mid-segment	2.0	1.0	No	

Stream: **Willow Brook** Reach: **T2.05-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**10.80**	2.11 Riffle/Step Spacing:	**130 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.60**	2.12 Substrate Composition		Bed:	**280**	**mm**
2.3 Mean Depth (tf):	**1.97**	Bedrock:	**0.0 %**	Bar:	**N/A**	**mm**
2.4 Floodprone Width (ft.):	**95.00**	Boulder:	**5.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.90**	Cobble:	**28.0 %**	Stream Type:	**E**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**42.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**5.48**	Fine Gravel:	**9.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**8.80**	Sand:	**16.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.50**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:	**E**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**14**	Reference Bed Material:	**Gravel**	
				Reference Subclass Slope:	**None**	
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**129.2**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**0.0**	**3.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**199.0**	Canopy %:	**51-75**	**26-50**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**0-25**
Sub-Dominant	**26-50**	**26-50**
W less than 25	**0**	**536**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Shrubs/Sapling**	**Pasture**
Sub-dominant	**Commercial**	**Shrubs/Sapling**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Willow Brook** Reach: **T2.05-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**10**	**Yes**	**No**	**Yes**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**0**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**0**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**378**
Side:	**1**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**9**	**None**	**No**	Geomorphic Rating	**0.55**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**12**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**13**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**44**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Reading Hill Brook	SGAT Version:	4.56
Reach:	T3.01-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,017	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	8/7/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **Begins at the reach break South of the intersection of Vt-106 and Agony Hill Rd and continues upstream to the next reach break just south of the talc mine storage ponds**

Step 5 - Notes:

Step 7 - Narrative: **This segment had a unique bedform and channel characteristics. It is E-type currently and likely also by reference. We observed numerous grade controls that represented most of the vertical drop within the reach. Riffles below the grade controls were very clean cobble substrate, the remainder of the reach consisted of deep runs and pools. Encroachment from Rt 106 decreased the floodplain throughout, especially in the upper reach where the road was immediately adjacent to the channel. Most of the reach was likely historically straightened, however the grade controls limited incision decreasing the impact. We assessed the reach as stage IIc with some observed aggradation and planform changes.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	123	11	0	
Road:	1,771	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	180		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Steep	Hilly
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Sometimes	Never
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	200
Width Determination:	Measured
Confinement Type:	BD
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	5.0	3.0	No	
Ledge	Mid-segment	2.0	0.0	No	
Ledge	Mid-segment	1.0	0.0	No	
Ledge	Mid-segment	3.0	2.0	No	
Ledge	Mid-segment	1.0	0.0	No	
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	3.0	2.0	No	
Ledge	Mid-segment	4.0	2.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	4.0	2.0	No	

Stream: **Reading Hill Brook** Reach: **T3.01-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**14.00**	2.11 Riffle/Step Spacing:	**120 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.65**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**1.96**	Bedrock:	**0.0 %**	Bar:	**N/A**	**mm**
2.4 Floodprone Width (ft.):	**560.00**	Boulder:	**1.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.65**	Cobble:	**40.0 %**	Stream Type:	**E**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**46.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**7.14**	Fine Gravel:	**8.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**40.00**	Sand:	**5.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.38**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**25**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**59.3**	**220.9**	Dominant:	**Shrubs/Sapling**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.3**	**3.4**	Sub-dominant:	**Herbaceous**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**234.6**	**463.7**	Canopy %:	**26-50**	**51-75**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**0-25**	**51-100**
W less than 25	**390**	**1,533**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Shrubs/Sapling**	**Commercial**	Mass Failures		
Sub-dominant	**Residential**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Reading Hill Brook** Reach: **T3.01-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**Small Withdrawal**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:	**Other**	Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**1**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Old Abutment	11.5	No	No	Yes	Yes	None
Bridge	17	Yes	No	No	Yes	Deposition Above,Deposition Below
Bridge	14.5	Yes	No	No	Yes	Deposition Below
Bridge	32	Yes	No	No	Yes	Deposition Above,Deposition Below,Scour Above,Scour Below
Bridge	12	Yes	No	Yes	Yes	Deposition Above,Deposition Below

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**4**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**0**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**994**
Side:	**4**	Braiding:	**0**	Steep Riffles:	**3**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**13**	**None**	**Yes**	Geomorphic Rating	**0.57**
7.2 Channel Aggradation		**11**	**None**	**No**	Channel Evolution Model	**D**
7.3 Widening Channel		**13**	**None**	**No**	Channel Evolution Stage	**IIc**
7.4 Change in Planforml		**9**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**46**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Reading Hill Brook	SGAT Version:	4.56
Reach:	T3.02-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,161	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	8/7/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional
		Why Not Assessed:	bedrock gorge

Step 0 - Location: **This segment spans the length of the talc mine storage ponds and is bound by the reach break downstream and the segmentation point upstream. The segment was walked (quickly) but not fully assessed due to property access concerns. Effectively a gorge.**

Step 5 - Notes: **Entire segment was a blasted channel around the talc mine ponds.**

Step 7 - Narrative: **The constructed channel was blasted bedrock in the lower and upper portions of the segment, and poured concrete in the middle section. Some bed scour was visible but the channel appeared stable. A small area of bank instability was observed immediately downstream of the poured concrete, this area could result in a catastrophic failure of the berm holding the large pond on the left floodplain. Recent survey marking indicate that this instability is being addressed. No floodplain areas were observed and this reach has no opportunities for widening or planform adjustment. It will be stuck in Stage II as an F-type channel for a long time.**

Step 1. Valley and Floodplain

1.1 Segmentation: Subreach

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	1,103	20	0	
Road:	1,161	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Sometimes	Always
Within 1 Bankfull W:	Always	Always
Texture:	Other	Bedrock

1.5 Valley Features	
Valley Width (ft):	45
Width Determination:	Measured
Confinement Type:	NC
In Rock Gorge:	Yes
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	4.0	2.0	No	
Ledge	Mid-segment	3.0	0.0	No	

Stream: **Reading Hill Brook** Reach: **T3.02-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):		2.11 Riffle/Step Spacing:		2.13 Average Largest Particle on	
2.2 Max Depth (ft.):		2.12 Substrate Composition		Bed:	
2.3 Mean Depth (tf):		Bedrock:	%	Bar:	
2.4 Floodprone Width (ft.):		Boulder:	%	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):		Cobble:	%	Stream Type:	**F**
Human Elev FloodPln (ft.):		Coarse Gravel:	%	Bed Material:	**Bedrock**
2.6 Width/Depth Ratio:	**0.00**	Fine Gravel:	%	Subclass Slope:	
2.7 Entrenchment Ratio:	**0.00**	Sand:	%	Bed Form:	**Plane Bed**
2.8 Incision Ratio:	**0.00**	Silt and Smaller:	%	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:		2.15 Sub-reach Stream Type	
2.9 Sinuosity:		Detritus:	**0.0 %**	Reference Stream Type:	**B**
2.10 Riffles Type:		# Large Woody Debris:		Reference Bed Material:	**Boulder**
				Reference Subclass Slope:	
				Reference Bedform:	**Step-Pool**

Step 3. Riparian Features

3.1 Stream Banks

Bank Texture			Bank Erosion	Left	Right	Typical Bank Slope:		
Upper	Left	Right	Erosion Length (ft.):	**0.0**	**0.0**	Near Bank Vegetation Type	Left	Right
Material Type:	**Bedrock**	**Bedrock**	Erosion Height (ft.):	**0.0**	**0.0**	Dominant:	**Herbaceous**	**Coniferous**
Consistency:	**Cohesive**	**Cohesive**	Revetment Type:	**Multiple**	**Rip-Rap**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Lower			Revetment Length:	**1,005.0**	**461.6**	Bank Canopy		
Material Type:	**Bedrock**	**Bedrock**				Canopy %:	**1-25**	**76-100**
Consistency:	**Cohesive**	**Cohesive**				Mid-Channel Canopy:	**Closed**	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**26-50**
Sub-Dominant	**0-25**	**51-100**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Industrial**	**Forest**	Mass Failures	**38.079 25**	
Sub-dominant	**Shrubs/Sapling**	**Commercial**	Height	**15.0**	
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**15.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Reading Hill Brook** Reach: **T3.02-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**1**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**0**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Other	10	Yes	No	Yes	Yes	None
Other	12	Yes	No	Yes	Yes	None
Instream Culvert	15	Yes	No	Yes	Yes	Deposition Above

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**0**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**0**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**1,161**
Side:	**0**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:	6.4 Sediment Deposition:	Stream Gradiant Type	Left	Right
6.2 Pool Substrate:	6.5 Channel Flow Status:	6.8 Bank Stability:		
6.3 Pool Variability:	6.6 Channel Alteration:	6.9 Bank Vegetation Protection		
Total Score:	6.7 Channel Sinuosity:	6.10 Riparian Veg. Zone Width:		
Habitat Rating:				
Habitat Stream Condition:				

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation					Geomorphic Rating	
7.2 Channel Aggradation					Channel Evolution Model	**F**
7.3 Widening Channel					Channel Evolution Stage	**II**
7.4 Change in Planforml					Geomorphic Condition	**Poor**
Total Score					Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Reading Hill Brook	SGAT Version:	4.56
Reach:	T3.02-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,649	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	8/7/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the segmentation point upstream of the talc mine storage ponds and continues upstream to the reach break downstream of the intersection of Rt-106 and Reading Farms Rd**

Step 5 - Notes:

Step 7 - Narrative: **This E-type reach has some areas of historic straightening that remain straightened. The remainder of the reach is adjusting planform and we observed several potential neck cutoffs and a few active cutoffs and flood chutes. Many beaver dams were recently mechanically removed from the segment, leading to some areas of temporary erosion as the bed adjusts slope.**

Step 1. Valley and Floodplain

1.1 Segmentation:	Subreach				1.4 Adjacent Side	Left	Right	1.5 Valley Features
1.2 Alluvial Fan:	None				Hillside Slope:	Hilly	Steep	Valley Width (ft): 290
1.3 Corridor Encroachments:					Continuous w/ Bank:	Never	Never	Width Determination: Estimated
Length (ft)	One	Height	Both	Height	Within 1 Bankfull W:	Never	Never	Confinement Type: VB
Berm:	0		0		Texture:	Mixed	Mixed	In Rock Gorge: No
Road:	2,139	10	0					Human Caused Change in Valley Width?: Yes
Railroad:	0		0					
Imp. Path:	0		0					
Dev.:	0		0					

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	5.0	2.0	No	
Ledge	Mid-segment	3.0	1.0	No	
Ledge	Mid-segment	1.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	1.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	3.5	2.0	No	

Stream: **Reading Hill Brook** Reach: **T3.02-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**12.20**	2.11 Riffle/Step Spacing:	**90 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.90**	2.12 Substrate Composition		Bed:	**120**	**mm**
2.3 Mean Depth (tf):	**2.31**	Bedrock:	**0.0 %**	Bar:	**40**	**mm**
2.4 Floodprone Width (ft.):	**150.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.10**	Cobble:	**2.0 %**	Stream Type:	**E**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**59.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**5.28**	Fine Gravel:	**22.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**12.30**	Sand:	**17.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.41**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**6.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**26**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**247.4**	**197.5**	Dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.6**	**2.2**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**251.4**	**350.3**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**51-100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**833**	**1,783**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Shrubs/Sapling**	**Commercial**	Mass Failures		
Sub-dominant	**Residential**	**Shrubs/Sapling**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Reading Hill Brook** Reach: **T3.02-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**4**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**2**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**85**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Old Abutment	**10**	**Yes**	**No**	**Yes**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**1**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**0**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**5**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**776**
Side:	**2**	Braiding:	**0**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**13**	**None**	**No**	Geomorphic Rating	**0.65**
7.2 Channel Aggradation		**15**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**15**	**None**	**No**	Channel Evolution Stage	**IV**
7.4 Change in Planforml		**9**	**None**	**No**	Geomorphic Condition	**Good**
Total Score		**52**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Reading Hill Brook	SGAT Version:	4.56
Reach:	T3.03-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,090	Observers:	JHB, MPL
Rain:	Yes	Completion Date:	8/7/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach follows Rt-106. The lower reach break is found near Reading Farms Rd., and the upper reach break is found east of the intersection of Whitmore Circle and Jenne Road.**

Step 5 - Notes: **Head cut is due to an abandoned beaver dam, not indicative of channel degradation. There is a short stretch (400-500 ft) of the reach downstream of the Whitmore Circle crossing that has numerous grade controls and different stream morphology. This stretch has C-type geometry in a narrow valley settings. This area was not segmented out during surveys due to its short length.**

Step 7 - Narrative: **The lower portion of the reach has one recently removed beaver dam and alternates between reference C and reference E. Above the Whitmore Circle culvert the reach flows through an active beaver meadow. Much of this portion is highly impacted by beaver dams with multiple channels and deep deposition. The cross-section was collected near the top of the reach where the channel returns to a single thread and is E-type.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	1,924	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Hilly	Hilly
Continuous w/ Bank:	Never	Never
Within 1 Bankfull W:	Never	Never
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	200
Width Determination:	Estimated
Confinement Type:	VB
In Rock Gorge:	No

Human Caused Change in Valley Width?: Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	0.0	0.0	No	
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	4.0	3.0	No	
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	1.0	0.0	No	
Ledge	Mid-segment	2.0	1.0	No	

Stream: **Reading Hill Brook** Reach: **T3.03-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**11.20**	2.11 Riffle/Step Spacing:	**70 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.80**	2.12 Substrate Composition		Bed:	**140**	**mm**
2.3 Mean Depth (tf):	**1.40**	Bedrock:	**0.0 %**	Bar:	**50**	**mm**
2.4 Floodprone Width (ft.):	**200.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**2.60**	Cobble:	**17.0 %**	Stream Type:	**E**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**52.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**8.00**	Fine Gravel:	**21.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**17.86**	Sand:	**10.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.44**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**High**	Detritus:	**8.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**69**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**150.0**	**28.8**	Dominant:	**Herbaceous**	**Herbaceous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**2.8**	**3.0**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**1,025.0**	**48.5**	Canopy %:	**1-25**	**1-25**
Material Type:	**Mix**	**Mix**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**26-50**
W less than 25	**1,067**	**104**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right
Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**
Sub-dominant	**Commercial**	**Forest**
(Legacy)	Amount	Mean Hieght
Failures	**None**	
Gullies	**None**	

	Left	Right
Mass Failures		
Height		
Gullies Number	**0**	
Gullies Length	**0**	

Stream: **Reading Hill Brook** Reach: **T3.03-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**3**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**8**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**3**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**450**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Instream Culvert	**5**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Above,Deposition Below**
Instream Culvert	**12**	**Yes**	**Yes**	**Yes**	**Yes**	**Deposition Above,Deposition Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**3**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**6**	Delta:	**0**	Flood chutes:	**1**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**0**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**1**	Straightening Length (ft.):	**479**
Side:	**7**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**No**	Geomorphic Rating	**0.51**
7.2 Channel Aggradation		**10**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**IV**
7.4 Change in Planforml		**9**	**None**	**Yes**	Geomorphic Condition	**Fair**
Total Score		**41**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Reading Hill Brook	SGAT Version:	4.56
Reach:	T3.04-0	Organization:	Fitzgerald Environmental
Segment Length(ft):	2,902	Observers:	JHB, MPL
Rain:	No	Completion Date:	8/27/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach follows Rt-106. The lower reach break is found east of the intersection of Whitmore Circle and Jenne Road. The upper reach break is found at a change in valley confinement approx. 1/2 mile to the north along Rt 106.**

Step 5 - Notes:

Step 7 - Narrative: **The lowest portion of the reach transitions from a B-type with a small low floodplain and some planform adjustments to a narrowly confined reference B or Ab reach that is highly encroached by Rt 106. This encroachment likely pushed the stream against the valley walls and has removed all floodplain resulting in a departure to F. The stream bed and banks are primarily bedrock or heavy rip-rap along the embankment, leaving little to no opportunity for channel adjustment vertically or laterally.**

Step 1. Valley and Floodplain

1.1 Segmentation: None

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	2,902	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Very Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Always
Texture:	Bedrock	Boulder

1.5 Valley Features	
Valley Width (ft):	35
Width Determination:	Estimated
Confinement Type:	NC
In Rock Gorge:	No

Human Caused Change in Valley Width?: Yes

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	6.0	2.0	No	
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	4.0	7.0	No	
Waterfall	Mid-segment	10.0	9.0	No	
Ledge	Mid-segment	5.0	3.0	No	
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	5.0	2.5	No	
Ledge	Mid-segment	1.0	0.0	No	
Ledge	Mid-segment	1.0	0.0	No	
Ledge	Mid-segment	6.0	3.0	Yes	
Ledge	Mid-segment	2.0	1.0	No	
Ledge	Mid-segment	5.0	1.0	No	

Stream: **Reading Hill Brook** Reach: **T3.04-0**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**13.77**	2.11 Riffle/Step Spacing:	**80 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.00**	2.12 Substrate Composition		Bed:	**450**	**mm**
2.3 Mean Depth (tf):	**1.27**	Bedrock:	**70.0 %**	Bar:	**N/A**	**mm**
2.4 Floodprone Width (ft.):	**17.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**4.65**	Cobble:	**1.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**3.0 %**	Bed Material:	**Bedrock**	
2.6 Width/Depth Ratio:	**10.84**	Fine Gravel:	**11.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.23**	Sand:	**15.0 %**	Bed Form:	**Step-Pool**	
2.8 Incision Ratio:	**2.33**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**71**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**78.6**	**95.2**	Dominant:	**Coniferous**	**Herbaceous**
Material Type:	**Bedrock**	**Mix**	Erosion Height (ft.):	**3.0**	**6.7**	Sub-dominant:	**Herbaceous**	**Shrubs/Sapling**
Consistency:	**Cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**521.9**	**1,500.4**	Canopy %:	**76-100**	**26-50**
Material Type:	**Bedrock**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**0-25**	**51-100**
W less than 25	**1,431**	**1,386**
Buffer Vegitation Type		
Dominant	**Coniferous**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Commercial**	Mass Failures		**25.01459**
Sub-dominant	**Commercial**	**Shrubs/Sapling**	Height		**20.0**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**20.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Reading Hill Brook** Reach: **T3.04-0**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**5**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**8**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bedrock Outcrops	7	Yes	Yes	Yes	Yes	None
Bedrock Outcrops	3	Yes	No	Yes	Yes	None
Other	12	Yes	Yes	No	Yes	None
Instream Culvert	10.5	Yes	No	No	Yes	None

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**4**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**1**	5.5 Straightening:	**None**
Point:	**0**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**3**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**B to F**	**Yes**	Geomorphic Rating	**0.41**
7.2 Channel Aggradation		**11**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**33**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Bailey Brook	SGAT Version:	4.56
Reach:	T4.01-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	2,130	Observers:	EPF, JHB
Rain:	Yes	Completion Date:	8/28/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This segment begins at the confluence of Bailey's Brook and Mill brook and extends upstream to the bridge next to the Bailey's Mills bed and breakfast**

Step 5 - Notes: **Alluvial fan setting had major deposition of coarse sediment and debris during T.S. Irene in 2011, clogging Bailey's Mills Road arch structure and causing overbank flow down the road. Channel sediment and debris was cleared upstream of road and downstream at Smith's property. Clearing and windrowing left berms along the right (south) bank upstream of the crossing. Severe sediment deposition girdled numerous trees in floodplain. The area upstream of Bailey's Mills Road culvert should be considered for floodplain restoration.**

Step 7 - Narrative: **Severe vertical and lateral adjustments throughout reach due to alluvial fan setting, undersized crossing, and post-flood recovery work that left channel prone to ongoing erosion. In lower segment below Bailey's Mills Road, entrenchment ratios are <2.0 due to severe channel widening. Upstream of Bailey's Mills Road, some berms left from flood recovery work are confining flood flows. Stream type departure varies between C->D and C->F depending on limits of berming. D-type departure chosen due to severe aggradation and braiding throughout, and presence of grade controls.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **Yes**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	131	5	0	
Road:	2,122	15	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	450		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Hilly	Steep
Continuous w/ Bank:	Never	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	N.E.	Mixed

1.5 Valley Features	
Valley Width (ft):	200
Width Determination:	Measured
Confinement Type:	BD
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	4.0	2.0	No	

Stream: **Bailey Brook** Reach: **T4.01-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**45.89**	2.11 Riffle/Step Spacing:	**275 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**3.00**	2.12 Substrate Composition		Bed:	**350**	**mm**
2.3 Mean Depth (tf):	**1.10**	Bedrock:	**0.0 %**	Bar:	**110**	**mm**
2.4 Floodprone Width (ft.):	**54.00**	Boulder:	**8.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.70**	Cobble:	**34.0 %**	Stream Type:	**D**	
Human Elev FloodPln (ft.):	**6.70**	Coarse Gravel:	**28.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**41.72**	Fine Gravel:	**4.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.18**	Sand:	**26.0 %**	Bed Form:	**Braided**	
2.8 Incision Ratio:	**1.23**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**2.23**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:	**C**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**24**	Reference Bed Material:	**Gravel**	
				Reference Subclass Slope:	**b**	
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**787.0**	**455.1**	Dominant:	**Herbaceous**	**Deciduous**
Material Type:	**Gravel**	**Gravel**	Erosion Height (ft.):	**6.6**	**4.2**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**20.6**	Canopy %:	**26-50**	**26-50**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**26-50**	**26-50**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**755**	**0**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Deciduous**
Sub-Dominant	**Deciduous**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Commercial**	**Commercial**	Mass Failures		
Sub-dominant	**Residential**	**Forest**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Bailey Brook** Reach: **T4.01-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch: **0**	Road Ditch: **1**
4.3 Flow Status:	**Moderate**	Impoundments:		Other: **0**	Tile Drain: **0**
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow: **0**	Urb Strm Wtr Pipe: **0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bridge	**19**	**No**	**No**	**Yes**	**Yes**	**Deposition Above**
Bridge	**20**	**Yes**	**No**	**No**	**Yes**	**Deposition Below,Scour Above,Scour Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**3**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**7**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**3**	Braiding:	**1**	Steep Riffles:	**3**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**None**	**No**	Geomorphic Rating	**0.21**
7.2 Channel Aggradation		**3**	**C to D**	**No**	Channel Evolution Model	**D**
7.3 Widening Channel		**3**	**None**	**No**	Channel Evolution Stage	**IId**
7.4 Change in Planforml		**6**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**17**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Bailey Brook	SGAT Version:	4.56
Reach:	T4.01-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	2,040	Observers:	JHB, MPL, EPF
Rain:	No	Completion Date:	8/28/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This segment begins at the segment point at the bridge by Bailey's Mills bed and breakfast and extends upstream to the segment point southeast to the intersection of Baileys Mills and Kittridge Pasture Rd**

Step 5 - Notes: **Huge side bars fill most of the channel margins that were widened to 80 to 100ft during TSI. Some areas of widening were filling in with large mid bars, however most of the reach is scouring down and not currently aggrading sediments.**

Step 7 - Narrative: **This segment was massively scoured during T.S. Irene and typically widened to 50-80 feet. The scoured channel was then buried in 4-8ft of gravel/cobble. The stream is currently cutting down through these deposits and was observed to be well below the pre-Irene bed elevation in several areas. Floodplain access was non-existent and only minimal storage was possible on top of flood sediments in areas where the channel was wider. This reach is actively cutting down and is deeply incised, assessed as a B to F departure and stage II.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	235	10	0	
Road:	29	15	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	135		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Always
Texture:	N.E.	N.E.

1.5 Valley Features	
Valley Width (ft):	150
Width Determination:	Estimated
Confinement Type:	NW
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	4.0	3.0	Yes	
Ledge	Mid-segment	3.0	1.0	No	
Ledge	Mid-segment	5.0	4.0	No	

Stream: **Bailey Brook** Reach: **T4.01-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**29.70**	2.11 Riffle/Step Spacing:	**180 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.30**	2.12 Substrate Composition		Bed:	**550**	**mm**
2.3 Mean Depth (tf):	**1.11**	Bedrock:	**0.0 %**	Bar:	**240**	**mm**
2.4 Floodprone Width (ft.):	**34.00**	Boulder:	**15.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**8.65**	Cobble:	**30.0 %**	Stream Type:	**F**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**26.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**26.76**	Fine Gravel:	**7.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.14**	Sand:	**13.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**3.76**	Silt and Smaller:	**9.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**5.0 %**	Reference Stream Type:	**B**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**50**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:		
				Reference Bedform:	**Step-Pool**	

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**429.3**	**485.9**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**8.9**	**6.4**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Clay**	**Clay**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Cohesive**	**Cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**224**	**228**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures	**284.64**	**352.2886**
Sub-dominant	**Shrubs/Sapling**	**Shrubs/Sapling**	Height	**19.2**	**21.3**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**18.8**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Bailey Brook** Reach: **T4.01-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions: **None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**5**	Delta:	**1**	Flood chutes:	**0**	Avulsion:	**1**	5.5 Straightening:	**None**
Point:	**1**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**10**	Braiding:	**1**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**5**	**B to F**	**No**	Geomorphic Rating	**0.32**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**6**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**8**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**26**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Bailey Brook	SGAT Version:	4.56
Reach:	T4.01-C	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,743	Observers:	EPF, JHB, MPL
Rain:	No	Completion Date:	8/28/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the segmentation point southeast of the intersection of Baileys Mills and Kittridge Pasture Rd and extends upstream to the next reach break along Kittridge Pasture Rd**

Step 5 - Notes: **This reach was a massive sediment source and storage area. Near continuous bank erosion and mass failure are contributing huge volumes of sediment to the channel. Numerous debris jams and grade controls are also storing huge volumes of sediment.**

Step 7 - Narrative: **This reach also massively widened during T. S. Irene, scouring from valley wall to valley wall throughout. Huge volumes of cobbles and gravels were deposited and continue to work through the reach. This segment is very different from T4.01B. However, the ongoing deposition is filling the channel leading to floodplain access and planform adjustment. Some grade control was observed and huge debris jams were also helping to hold the bed in place and allow for aggradation. This widening, aggradation, and planform adjustment led to a B to D departure and an assessment as type IIc.**

Step 1. Valley and Floodplain

1.1 Segmentation:	Channel Dimensions			1.4 Adjacent Side	Left	Right	1.5 Valley Features
1.2 Alluvial Fan:	None			Hillside Slope:	Extr.Steep	Very Steep	Valley Width (ft): 150
1.3 Corridor Encroachments:				Continuous w/ Bank:	Sometimes	Sometimes	Width Determination: Estimated
Length (ft)	One	Height	Both	Height	Within 1 Bankfull W:	Always	Always	Confinement Type: NW
Berm:	0		0		Texture:	Mixed	Mixed	In Rock Gorge: No
Road:	0		0					Human Caused Change in Valley Width?: No
Railroad:	0		0					
Imp. Path:	0		0					
Dev.:	0		0					

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Ledge	Mid-segment	6.0	4.0	No	
Ledge	Mid-segment	6.0	4.0	No	

Stream: **Bailey Brook** Reach: **T4.01-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**45.72**	2.11 Riffle/Step Spacing:	**160 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.15**	2.12 Substrate Composition		Bed:	**600**	**mm**
2.3 Mean Depth (tf):	**1.07**	Bedrock:	**0.0 %**	Bar:	**240**	**mm**
2.4 Floodprone Width (ft.):	**116.00**	Boulder:	**6.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**3.70**	Cobble:	**45.0 %**	Stream Type:	**D**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**27.0 %**	Bed Material:	**Cobble**	
2.6 Width/Depth Ratio:	**42.73**	Fine Gravel:	**11.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**2.54**	Sand:	**7.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.72**	Silt and Smaller:	**4.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**184**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Moderate**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**975.6**	**265.5**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**10.1**	**6.4**	Sub-dominant:	**Shrubs/Sapling**	**Shrubs/Sapling**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Silt**	**Clay**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Cohesive**	**Cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**51-100**	**None**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Deciduous**	**Deciduous**
Sub-Dominant	**Shrubs/Sapling**	**Herbaceous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures	**454.4296**	**764.83**
Sub-dominant	**Commercial**	**None**	Height	**49.8**	**42.4**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**40.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Bailey Brook** Reach: **T4.01-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**9**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Bedrock Outcrops	**20**	**No**	**No**	**Yes**	**Yes**	**Deposition Above,Scour Below,Alignment**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**1**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**10**	Delta:	**0**	Flood chutes:	**7**	Avulsion:	**1**	5.5 Straightening:	**None**
Point:	**3**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**23**	Braiding:	**1**	Steep Riffles:	**6**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**12**	**None**	**No**	Geomorphic Rating	**0.31**
7.2 Channel Aggradation		**4**	**B to D**	**No**	Channel Evolution Model	**D**
7.3 Widening Channel		**4**	**None**	**No**	Channel Evolution Stage	**IIc**
7.4 Change in Planforml		**5**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**25**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Bailey Brook	SGAT Version:	4.56
Reach:	T4.02-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	4,101	Observers:	JHB, MPL
Rain:	No	Completion Date:	8/28/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach is bound by the first reach break and segment point northwest of the intersection of Kitteridge Pasture and Stone Chimney Rd.**

Step 5 - Notes: **Huge deposition features were observed throughout the segment along with numerous flood chutes and avulsions. Large mid bars with channel braiding were common.**

Step 7 - Narrative: **Similar to T4.01.C, this segment scoured the entire valley during T.S. Irene and filled in with 6-8ft of cobble and gravel deposition. The channel is now carving through these deposits and adjusting planform. We assessed the CEM stage for this segment as IId due to the areas of braiding and increased planform adjustment. Bankfull width and W/D were also lower and we assessed the segment as a departure from B to C.**

Step 1. Valley and Floodplain

1.1 Segmentation: Channel Dimensions

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	0		0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Always
Texture:	Mixed	Mixed

1.5 Valley Features	
Valley Width (ft):	120
Width Determination:	Estimated
Confinement Type:	NW
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls: None

Stream: **Bailey Brook** Reach: **T4.02-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**24.25**	2.11 Riffle/Step Spacing:	**180 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**2.30**	2.12 Substrate Composition		Bed:	**550**	**mm**
2.3 Mean Depth (tf):	**1.45**	Bedrock:	**0.0 %**	Bar:	**150**	**mm**
2.4 Floodprone Width (ft.):	**59.00**	Boulder:	**12.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**2.95**	Cobble:	**37.0 %**	Stream Type:	**C**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**27.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**16.72**	Fine Gravel:	**9.0 %**	Subclass Slope:	**b**	
2.7 Entrenchment Ratio:	**2.43**	Sand:	**15.0 %**	Bed Form:	**Braided**	
2.8 Incision Ratio:	**1.28**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**2.0 %**	Reference Stream Type:	**B**	
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**242**	Reference Bed Material:	**Cobble**	
				Reference Subclass Slope:	**None**	
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**929.4**	**545.6**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**5.0**	**6.0**	Sub-dominant:	**Shrubs/Sapling**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**51-75**	**51-75**
Material Type:	**Clay**	**Clay**				Mid-Channel Canopy:	**Open**	
Consistency:	**Cohesive**	**Cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**51-100**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures	**1430.457**	**874.2355**
Sub-dominant	**None**	**None**	Height	**75.4**	**69.3**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**63.8**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Bailey Brook** Reach: **T4.02-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Minimal**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**5**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions: **None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**2**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**8**	Delta:	**0**	Flood chutes:	**3**	Avulsion:	**2**	5.5 Straightening:	**None**
Point:	**20**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**6**	Braiding:	**1**	Steep Riffles:	**2**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**No**	Geomorphic Rating	**0.31**
7.2 Channel Aggradation		**5**	**Other**	**No**	Channel Evolution Model	**D**
7.3 Widening Channel		**4**	**None**	**No**	Channel Evolution Stage	**IId**
7.4 Change in Planforml		**5**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**25**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Bailey Brook	SGAT Version:	4.56
Reach:	T4.02-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	4,680	Observers:	EPF, JHB, MPL
Rain:	No	Completion Date:	8/28/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach is bound by the segmentation point and reach break downstream and to the southwest of the Brown Schoolhouse Rd crossing.**

Step 5 - Notes:

Step 7 - Narrative: **Similar to T4.01C and T4.02A, this segment scoured the entire valley during T.S. Irene and filled in with approximately 2ft of cobble and gravel deposition. The channel is now carving through these deposits and adjusting planform. We assessed the segment as IID due to the areas of braiding and increased planform adjustment. Bankfull dimensions were relatively close to reference width and with only moderate incision. Most of the reach is lined with eroding banks and mass failures and it will remain highly active for a long time.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	0		0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Sometimes	Sometimes
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	70
Width Determination:	Estimated
Confinement Type:	SC
In Rock Gorge:	No
Human Caused Change in Valley Width?:	No

1.6 Grade Controls: **None**

Stream: **Bailey Brook** Reach: **T4.02-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**19.73**	2.11 Riffle/Step Spacing:	**150 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.80**	2.12 Substrate Composition		Bed:	**400**	**mm**
2.3 Mean Depth (tf):	**1.28**	Bedrock:	**0.0 %**	Bar:	**130**	**mm**
2.4 Floodprone Width (ft.):	**36.00**	Boulder:	**9.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**2.55**	Cobble:	**40.0 %**	Stream Type:	**B**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**24.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**15.41**	Fine Gravel:	**17.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.82**	Sand:	**10.0 %**	Bed Form:	**Step-Pool**	
2.8 Incision Ratio:	**1.42**	Silt and Smaller:	**0.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**Yes**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**3.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Sedimented**	# Large Woody Debris:	**289**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**389.3**	**697.0**	Dominant:	**Deciduous**	**Deciduous**
Material Type:	**Gravel**	**Gravel**	Erosion Height (ft.):	**7.1**	**7.3**	Sub-dominant:	**Herbaceous**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:	**76-100**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**>100**
Sub-Dominant	**None**	**None**
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Forest**	Mass Failures	**1169.468**	**990.1212**
Sub-dominant	**None**	**None**	Height	**37.5**	**52.2**
(Legacy)	Amount	Mean Hieght	Gullies Number	**1**	
Failures	**Multiple**	**37.1**	Gullies Length	**100**	
Gullies	**One**	**3.0**			

Stream: **Bailey Brook** Reach: **T4.02-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**19**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Instream Culvert	**8**	**Yes**	**No**	**Yes**	**Yes**	**Deposition Above,Scour Below**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**5**	Delta:	**0**	Flood chutes:	**7**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**5**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**1**	Straightening Length (ft.):	**0**
Side:	**10**	Braiding:	**1**	Steep Riffles:	**1**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**11**	**None**	**No**	Geomorphic Rating	**0.34**
7.2 Channel Aggradation		**7**	**None**	**No**	Channel Evolution Model	**D**
7.3 Widening Channel		**5**	**None**	**No**	Channel Evolution Stage	**IId**
7.4 Change in Planforml		**4**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**27**			Stream Sensitivity	**High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream: **Bailey Brook**
Reach: **T4.02-C**
Segment Length(ft): **6,758**
Rain: **No**

SGAT Version: **4.56**
Organization: **Fitzgerald Environmental**
Observers: **EPF**
Completion Date: **2/17/2015**
Qualtiy Control Status - Consultant: **Provisional**
Qualtiy Control Status - Staff: **Provisional**
Why Not Assessed: **Other (to be explained in comments)**

Step 0 - Location: **Begins immediately upstream of Brown Schoolhouse Road and continues to headwaters. Reach was not included in Ph2 assessment scope.**

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan:

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:				
Road:				
Railroad:				
Imp. Path:				
Dev.:				

1.4 Adjacent Side Left Right

Hillside Slope:

Continuous w/ Bank:

Within 1 Bankfull W:

Texture:

1.5 Valley Features

Valley Width (ft):

Width Determination:

Confinement Type:

In Rock Gorge:

Human Caused Change in Valley Width?:

1.6 Grade Controls:

Stream: **Bailey Brook** Reach: **T4.02-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):		2.11 Riffle/Step Spacing:		2.13 Average Largest Particle on	
2.2 Max Depth (ft.):		2.12 Substrate Composition		Bed:	
2.3 Mean Depth (tf):		Bedrock:	%	Bar:	
2.4 Floodprone Width (ft.):		Boulder:	%	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):		Cobble:	%	Stream Type:	
Human Elev FloodPln (ft.):		Coarse Gravel:	%	Bed Material:	
2.6 Width/Depth Ratio:	**0.00**	Fine Gravel:	%	Subclass Slope:	
2.7 Entrenchment Ratio:	**0.00**	Sand:	%	Bed Form:	
2.8 Incision Ratio:	**0.00**	Silt and Smaller:	%	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:		2.15 Sub-reach Stream Type	
2.9 Sinuosity:		Detritus:	%	Reference Stream Type:	
2.10 Riffles Type:		# Large Woody Debris:		Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope:

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):			Dominant:		
Material Type:			Erosion Height (ft.):			Sub-dominant:		
Consistency:			Revetment Type:			Bank Canopy		
Lower			Revetment Length:			Canopy %:		
Material Type:						Mid-Channel Canopy:		
Consistency:								

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant		
Sub-Dominant		
W less than 25		
Buffer Vegitation Type		
Dominant		
Sub-Dominant		

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant			Mass Failures		
Sub-dominant			Height		
(Legacy)	Amount	Mean Hieght	Gullies Number		
Failures			Gullies Length		
Gullies					

Stream: **Bailey Brook** Reach: **T4.02-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:

4.2 Adjacent Wetlands:

4.3 Flow Status:

4.4 # of Debris Jams:

4.5 Flow Regulation Type

Flow Reg. Use:

Impoundments:

Impoundment Loc.:

4.6 Up/Down Strm flow reg.:

(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**

Field Ditch: Road Ditch:

Other: Tile Drain:

Overland Flow: Urb Strm Wtr Pipe:

4.9 # of Beaver Dams:

Affected Length (ft):

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types Diagonal:

Mid: Delta:

Point: Island:

Side: Braiding:

5.2 Other Features Neck Cutoff:

Flood chutes: Avulsion:

5.3 Steep Riffles and Head Cuts Head Cuts:

Steep Riffles: Trib Rejuv.:

5.4 Stream Ford or Animal Crossing:

5.5 Straightening:

Straightening Length (ft.): **0**

5.5 Dredging:

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:

6.2 Pool Substrate:

6.3 Pool Variability:

Total Score:

Habitat Rating:

Habitat Stream Condition:

6.4 Sediment Deposition:

6.5 Channel Flow Status:

6.6 Channel Alteration:

6.7 Channel Sinuosity:

Stream Gradiant Type Left Right

6.8 Bank Stability:

6.9 Bank Vegetation Protection

6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic		
7.1 Channel Degradation				Geomorphic Rating	
7.2 Channel Aggradation				Channel Evolution Model	
7.3 Widening Channel				Channel Evolution Stage	
7.4 Change in Planforml				Geomorphic Condition	
Total Score				Stream Sensitivity	

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Unnamed Trib 02 to Beaver Brook	SGAT Version:	4.56
Reach:	T1.01.S4.01-A	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,127	Observers:	EPF
Rain:	No	Completion Date:	7/1/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins downstream of the brownsville-hartland and sheddsville Rd intersection and extends upstream to the first segmentation point along Sheddsville road.**

Step 5 - Notes: **Channel is affected by encroachment and buffer impacts from Sheddsville Road for most of the segment. Significant channel erosion and roadway damage occurred during T.S. Irene in 2011. Mass failures along bank opposite road will likely worsen over time given the extensive hard bank armoring.**

Step 7 - Narrative: **Channel is heavily encroached by Sheddsville Road and armored for >50% of segment. Rip rap installed following T.S. Irene in 2011 projects out into the channel beyond where the pre-flood banks were located, based on treeline. Channel may incise more, however there are significant fine sediment inputs from mass failures on the north bank opposite the road.**

Step 1. Valley and Floodplain

1.1 Segmentation: Channel Dimensions

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	1,117	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	101		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Extr.Steep	Very Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Sometimes
Texture:	Mixed	N.E.

1.5 Valley Features

Valley Width (ft):	60
Width Determination:	Measured
Confinement Type:	SC
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls: None

Stream: **Unnamed Trib 02 to Beaver Brook** Reach: **T1.01.S4.01-A**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**15.50**	2.11 Riffle/Step Spacing:		2.13 Average Largest Particle on			
2.2 Max Depth (ft.):	**1.55**	2.12 Substrate Composition			Bed:	**275**	**mm**
2.3 Mean Depth (tf):	**0.99**	Bedrock:	**0.0 %**		Bar:	**N/A**	**mm**
2.4 Floodprone Width (ft.):	**18.00**	Boulder:	**4.0 %**	2.14 Stream Type			
2.5 Aband. Floodpn (ft.):	**7.05**	Cobble:	**34.0 %**	Stream Type:	**F**		
Human Elev FloodPln (ft.):		Coarse Gravel:	**12.0 %**	Bed Material:	**Gravel**		
2.6 Width/Depth Ratio:	**15.66**	Fine Gravel:	**24.0 %**	Subclass Slope:	**b**		
2.7 Entrenchment Ratio:	**1.16**	Sand:	**26.0 %**	Bed Form:	**Plane Bed**		
2.8 Incision Ratio:	**4.55**	Silt and Smaller:	**0.0 %**	Field Measured Slope:	**3.9**		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type			
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:	**B**		
2.10 Riffles Type:	**Eroded**	# Large Woody Debris:	**19**	Reference Bed Material:	**Cobble**		
				Reference Subclass Slope:	**None**		
				Reference Bedform:	**Step-Pool**		

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**57.2**	**63.8**	Dominant:	**Deciduous**	**Herbaceous**
Material Type:	**Mix**	**Boulder/Cobble**	Erosion Height (ft.):	**9.0**	**6.0**	Sub-dominant:	**Coniferous**	**Deciduous**
Consistency:	**Cohesive**	**Non-cohesive**	Revetment Type:	**None**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**570.4**	Canopy %:	**76-100**	**26-50**
Material Type:	**Boulder/Cobble**	**Sand**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**>100**	**0-25**
Sub-Dominant	**51-100**	**26-50**
W less than 25	**0**	**900**
Buffer Vegitation Type		
Dominant	**Mixed Trees**	**Herbaceous**
Sub-Dominant	**Shrubs/Sapling**	**Deciduous**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Forest**	**Commercial**	Mass Failures	**91.2905**	
Sub-dominant	**Residential**	**Forest**	Height	**15.0**	
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**One**	**15.0**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Unnamed Trib 02 to Beaver Brook** Reach: **T1.01.S4.01-A**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs			
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	**0**	Road Ditch:	**2**
4.3 Flow Status:	**Low**	Impoundments:		Other:	**0**	Tile Drain:	**0**
4.4 # of Debris Jams:	**2**	Impoundment Loc.:		Overland Flow:	**0**	Urb Strm Wtr Pipe:	**0**
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:		**0**	
		(old) Upstrm Flow Reg.:		Affected Length (ft):		**0**	

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Instream Culvert	**12**	**Yes**	**No**	**Yes**	**Yes**	**None**
Bridge	**18**	**Yes**	**No**	**No**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**0**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**0**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**1**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**4**	**B to F**	**No**	Geomorphic Rating	**0.32**
7.2 Channel Aggradation		**5**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**10**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**7**	**None**	**No**	Geomorphic Condition	**Poor**
Total Score		**26**			Stream Sensitivity	**Extreme**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Unnamed Trib 02 to Beaver Brook	SGAT Version:	4.56
Reach:	T1.01.S4.01-B	Organization:	Fitzgerald Environmental
Segment Length(ft):	3,640	Observers:	EPF
Rain:	Yes	Completion Date:	7/1/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach is located between the two segmentation points along Sheddsville Rd.**

Step 5 - Notes: **Evidence of historical channel straightening throughout reach. Buffer impacts from horse farm greatest in lower segment. At upstream reach break there is a transition from higher gradient channel upstream, leading to coarse sediment deposition. Some dredging was noted in upper segment.**

Step 7 - Narrative: **Channel morphology has not departed significantly from reference, but sinuosity is low due to historical straightening. Channel likely aggraded coarse material during T.S. Irene in 2011. Aggradation and widening may occur in near future. Unless channel is armored or managed in future, natural planform may begin to redevelop upstream of the Sheddsville Road crossing. A severely undersized culvert is located on a private driveway mid-segment.**

Step 1. Valley and Floodplain

1.1 Segmentation: **Channel Dimensions**

1.2 Alluvial Fan: **None**

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	1,183	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	53		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Steep	Flat
Continuous w/ Bank:	Sometimes	Never
Within 1 Bankfull W:	Sometimes	Never
Texture:	N.E.	N.E.

1.5 Valley Features

Valley Width (ft):	415
Width Determination:	Measured
Confinement Type:	VB
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls: **None**

Stream: **Unnamed Trib 02 to Beaver Brook** Reach: **T1.01.S4.01-B**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**11.00**	2.11 Riffle/Step Spacing:	**80 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.30**	2.12 Substrate Composition		Bed:	**5**	**inches**
2.3 Mean Depth (tf):	**1.18**	Bedrock:	**0.0 %**	Bar:	**2.5**	**inches**
2.4 Floodprone Width (ft.):	**30.00**	Boulder:	**0.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**1.80**	Cobble:	**12.0 %**	Stream Type:	**E**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**25.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**9.32**	Fine Gravel:	**35.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**2.73**	Sand:	**23.0 %**	Bed Form:	**Riffle-Pool**	
2.8 Incision Ratio:	**1.38**	Silt and Smaller:	**5.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**4.0 %**	Reference Stream Type:	**E**	
2.10 Riffles Type:	**Complete**	# Large Woody Debris:	**38**	Reference Bed Material:	**Gravel**	
				Reference Subclass Slope:	**None**	
				Reference Bedform:	**Riffle-Pool**	

Step 3. Riparian Features

3.1 Stream Banks — Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**107.0**	**22.7**	Dominant:	**Herbaceous**	**Deciduous**
Material Type:	**Sand**	**Sand**	Erosion Height (ft.):	**3.2**	**3.0**	Sub-dominant:	**Shrubs/Sapling**	**Herbaceous**
Consistency:	**Non-cohesive**	**Non-cohesive**	Revetment Type:	**Rip-Rap**	**Rip-Rap**	Bank Canopy		
Lower			Revetment Length:	**77.3**	**244.8**	Canopy %:	**1-25**	**51-75**
Material Type:	**Gravel**	**Gravel**				Mid-Channel Canopy:	**Open**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**0-25**	**>100**
Sub-Dominant	**26-50**	**0-25**
W less than 25	**2,433**	**1,502**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Hay**	**Forest**	Mass Failures		
Sub-dominant	**Shrubs/Sapling**	**Residential**	Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Unnamed Trib 02 to Beaver Brook** Reach: **T1.01.S4.01-B**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Abundant**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**Abundant**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Low**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**3**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Instream Culvert	**6**	**Yes**	**No**	**Yes**	**Yes**	**None**
Instream Culvert	**4.5**	**Yes**	**No**	**Yes**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**Yes**
Mid:	**2**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**Straightening**
Point:	**12**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**3,092**
Side:	**7**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**Dredging**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Unconfined**	Score	STD	Historic		
7.1 Channel Degradation		**12**	**None**	**No**	Geomorphic Rating	**0.63**
7.2 Channel Aggradation		**13**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**15**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**50**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Unnamed Trib 02 to Beaver Brook	SGAT Version:	4.56
Reach:	T1.01.S4.01-C	Organization:	Fitzgerald Environmental
Segment Length(ft):	1,493	Observers:	EPF
Rain:	No	Completion Date:	7/1/2014
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional

Step 0 - Location: **This reach begins at the segmentation point downstream of the Bible Hill Rd crossing and extends upstream to where the VHD incorrectly crosses Sheddsville Road. The stream is actually flowing along the south side of the road.**

Step 5 - Notes: **The VHD incorrectly shows the stream crossing Sheddsville Road multiple times. The stream centerline for this segment stays on the southwest side of the road. Mass failures opposite the roadway armoring are contributing large amounts of fine sediment to the channel.**

Step 7 - Narrative: **Channel is encroached by Sheddsville Road for over half the segment length. Some areas of road armor (ie, rip rap) have constricted the channel by ~30%. Although no incision is reported (no natural floodplain for A-type channel), stage II CEM was selected to characterize the roadway impacts. Channel may incise in the future as there are no grade controls.**

Step 1. Valley and Floodplain

1.1 Segmentation: Channel Dimensions

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	904	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	0		0	

1.4 Adjacent Side

	Left	Right
Hillside Slope:	Extr.Steep	Extr.Steep
Continuous w/ Bank:	Sometimes	Sometimes
Within 1 Bankfull W:	Always	Always
Texture:	Mixed	Mixed

1.5 Valley Features

Valley Width (ft):	25
Width Determination:	Measured
Confinement Type:	NC
In Rock Gorge:	No
Human Caused Change in Valley Width?:	Yes

1.6 Grade Controls: None

Stream: **Unnamed Trib 02 to Beaver Brook** Reach: **T1.01.S4.01-C**

Step 2. Stream Channel

2.1Bankfull Width (ft.):	**11.50**	2.11 Riffle/Step Spacing:	**60 ft.**	2.13 Average Largest Particle on		
2.2 Max Depth (ft.):	**1.70**	2.12 Substrate Composition		Bed:	**40**	**inches**
2.3 Mean Depth (tf):	**1.15**	Bedrock:	**0.0 %**	Bar:	**N/A**	**inches**
2.4 Floodprone Width (ft.):	**12.00**	Boulder:	**12.0 %**	2.14 Stream Type		
2.5 Aband. Floodpn (ft.):	**1.70**	Cobble:	**24.0 %**	Stream Type:	**A**	
Human Elev FloodPln (ft.):		Coarse Gravel:	**18.0 %**	Bed Material:	**Gravel**	
2.6 Width/Depth Ratio:	**10.00**	Fine Gravel:	**12.0 %**	Subclass Slope:	**None**	
2.7 Entrenchment Ratio:	**1.04**	Sand:	**30.0 %**	Bed Form:	**Plane Bed**	
2.8 Incision Ratio:	**1.00**	Silt and Smaller:	**4.0 %**	Field Measured Slope:		
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:	**No**	2.15 Sub-reach Stream Type		
2.9 Sinuosity:	**Low**	Detritus:	**0.0 %**	Reference Stream Type:		
2.10 Riffles Type:	**Eroded**	# Large Woody Debris:	**43**	Reference Bed Material:		
				Reference Subclass Slope:		
				Reference Bedform:		

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope: **Steep**

Bank Texture	Left	Right	Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper			Erosion Length (ft.):	**0.0**	**43.3**	Dominant:	**Herbaceous**	**Deciduous**
Material Type:	**Mix**	**Mix**	Erosion Height (ft.):	**0.0**	**4.0**	Sub-dominant:	**Deciduous**	**Shrubs/Sapling**
Consistency:	**Cohesive**	**Cohesive**	Revetment Type:	**Rip-Rap**	**None**	Bank Canopy		
Lower			Revetment Length:	**328.9**	**0.0**	Canopy %:	**26-50**	**76-100**
Material Type:	**Boulder/Cobble**	**Boulder/Cobble**				Mid-Channel Canopy:	**Closed**	
Consistency:	**Non-cohesive**	**Non-cohesive**						

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	**51-100**	**>100**
Sub-Dominant	**0-25**	**0-25**
W less than 25	**512**	**43**
Buffer Vegitation Type		
Dominant	**Herbaceous**	**Mixed Trees**
Sub-Dominant	**Shrubs/Sapling**	**Shrubs/Sapling**

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant	**Residential**	**Forest**	Mass Failures	**48.02087**	**377.1464**
Sub-dominant	**Forest**	**None**	Height	**10.0**	**17.0**
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**Multiple**	**14.4**	Gullies Length	**0**	
Gullies	**None**				

Stream: **Unnamed Trib 02 to Beaver Brook** Reach: **T1.01.S4.01-C**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:	**Minimal**	4.5 Flow Regulation Type	**None**	4.7 Stormwater Inputs	**None**
4.2 Adjacent Wetlands:	**None**	Flow Reg. Use:		Field Ditch:	Road Ditch:
4.3 Flow Status:	**Moderate**	Impoundments:		Other:	Tile Drain:
4.4 # of Debris Jams:	**5**	Impoundment Loc.:		Overland Flow:	Urb Strm Wtr Pipe:
		4.6 Up/Down Strm flow reg.:	**None**	4.9 # of Beaver Dams:	**0**
		(old) Upstrm Flow Reg.:		Affected Length (ft):	**0**

4.8 Channel Constrictions:

Type	Width	Photo Taken?	GPS Taken?	Channel Constriction?	Floodprone Constriction?	Problems
Other	**9**	**Yes**	**No**	**Yes**	**Yes**	**None**
Bridge	**20**	**Yes**	**No**	**No**	**Yes**	**None**

Step 5. Channel Bed and Planform Changes

5.1 Bar Types		Diagonal:	**0**	5.2 Other Features		Neck Cutoff:	**0**	5.4 Stream Ford or Animal Crossing:	**No**
Mid:	**4**	Delta:	**0**	Flood chutes:	**0**	Avulsion:	**0**	5.5 Straightening:	**None**
Point:	**5**	Island:	**0**	5.3 Steep Riffles and Head Cuts		Head Cuts:	**0**	Straightening Length (ft.):	**0**
Side:	**0**	Braiding:	**0**	Steep Riffles:	**0**	Trib Rejuv.:	**No**	5.5 Dredging:	**None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:		6.4 Sediment Deposition:		Stream Gradiant Type	Left / Right
6.2 Pool Substrate:		6.5 Channel Flow Status:		6.8 Bank Stability:	
6.3 Pool Variability:		6.6 Channel Alteration:		6.9 Bank Vegetation Protection	
Total Score:	**0**	6.7 Channel Sinuosity:		6.10 Riparian Veg. Zone Width:	
Habitat Rating:	**0.00**				
Habitat Stream Condition:					

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	**Confined**	Score	STD	Historic		
7.1 Channel Degradation		**7**	**None**	**No**	Geomorphic Rating	**0.51**
7.2 Channel Aggradation		**13**	**None**	**No**	Channel Evolution Model	**F**
7.3 Widening Channel		**11**	**None**	**No**	Channel Evolution Stage	**II**
7.4 Change in Planforml		**10**	**None**	**No**	Geomorphic Condition	**Fair**
Total Score		**41**			Stream Sensitivity	**Very High**

Phase 2 Segment Summary Report Mill Brook - Basin 13

Stream:	Unnamed Trib 02 to Beaver Brook	SGAT Version:	4.56
Reach:	T1.01.S4.01-D	Organization:	Fitzgerald Environmental
Segment Length(ft):	5,298	Observers:	EPF
Rain:		Completion Date:	
		Qualtiy Control Status - Consultant:	Provisional
		Qualtiy Control Status - Staff:	Provisional
		Why Not Assessed:	Other (to be explained in comments)

Step 0 - Location: **This segment starts at the segment break near the incorrect VHD crossing of Sheddsville Rd. This segment was not assessed due to the scope of the project and the very small size of the watershed.**

Step 5 - Notes:

Step 7 - Narrative:

Step 1. Valley and Floodplain

1.1 Segmentation:

1.2 Alluvial Fan: None

1.3 Corridor Encroachments:

Length (ft)	One	Height	Both	Height
Berm:	0		0	
Road:	1,122	10	0	
Railroad:	0		0	
Imp. Path:	0		0	
Dev.:	270		0	

1.4 Adjacent Side Left Right

Hillside Slope:

Continuous w/ Bank:

Within 1 Bankfull W:

Texture:

1.5 Valley Features

Valley Width (ft):

Width Determination:

Confinement Type:

In Rock Gorge:

Human Caused Change in Valley Width?:

1.6 Grade Controls:

Type	Location	Total Height	Total Height Above Water	Photo Taken?	GPS Taken?
Dam	Mid-segment	0.0	0.0	No	
Dam	Mid-segment	0.0	0.0	No	

Stream: **Unnamed Trib 02 to Beaver Brook** Reach: **T1.01.S4.01-D**

Step 2. Stream Channel

2.1Bankfull Width (ft.):		2.11 Riffle/Step Spacing:		2.13 Average Largest Particle on	
2.2 Max Depth (ft.):		2.12 Substrate Composition		Bed:	
2.3 Mean Depth (tf):		Bedrock:	%	Bar:	
2.4 Floodprone Width (ft.):		Boulder:	%	2.14 Stream Type	
2.5 Aband. Floodpn (ft.):		Cobble:	%	Stream Type:	
Human Elev FloodPln (ft.):		Coarse Gravel:	%	Bed Material:	
2.6 Width/Depth Ratio:	**0.00**	Fine Gravel:	%	Subclass Slope:	
2.7 Entrenchment Ratio:	**0.00**	Sand:	%	Bed Form:	
2.8 Incision Ratio:	**0.00**	Silt and Smaller:	%	Field Measured Slope:	
Human Elevated Inc. Rat.:	**0.00**	Silt/Clay Present:		2.15 Sub-reach Stream Type	
2.9 Sinuosity:		Detritus:	%	Reference Stream Type:	
2.10 Riffles Type:		# Large Woody Debris:		Reference Bed Material:	
				Reference Subclass Slope:	
				Reference Bedform:	

Step 3. Riparian Features

3.1 Stream Banks

Typical Bank Slope:

Bank Texture			Bank Erosion	Left	Right	Near Bank Vegetation Type	Left	Right
Upper	Left	Right	Erosion Length (ft.):	**0.0**	**0.0**	Dominant:		
Material Type:			Erosion Height (ft.):	**0.0**	**0.0**	Sub-dominant:		
Consistency:			Revetment Type:	**None**	**None**	Bank Canopy		
Lower			Revetment Length:	**0.0**	**0.0**	Canopy %:		
Material Type:						Mid-Channel Canopy:		
Consistency:								

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant		
Sub-Dominant		
W less than 25	**0**	**0**
Buffer Vegitation Type		
Dominant		
Sub-Dominant		

3.3 Riparian Corridor

Corridor Land	Left	Right		Left	Right
Dominant			Mass Failures		
Sub-dominant			Height		
(Legacy)	Amount	Mean Hieght	Gullies Number	**0**	
Failures	**None**		Gullies Length	**0**	
Gullies	**None**				

Stream: **Unnamed Trib 02 to Beaver Brook** Reach: **T1.01.S4.01-D**

Step 4. Flow & Flow Modifiers

4.1 Springs / Seeps:

4.2 Adjacent Wetlands:

4.3 Flow Status:

4.4 # of Debris Jams: **0**

4.5 Flow Regulation Type **Small Run of River**

Flow Reg. Use: **Recreation**

Impoundments:

Impoundment Loc.:

4.6 Up/Down Strm flow reg.: **None**

(old) Upstrm Flow Reg.:

4.7 Stormwater Inputs **None**

Field Ditch: Road Ditch:

Other: Tile Drain:

Overland Flow: Urb Strm Wtr Pipe:

4.9 # of Beaver Dams: **0**

Affected Length (ft): **0**

4.8 Channel Constrictions:

Step 5. Channel Bed and Planform Changes

5.1 Bar Types Diagonal:

Mid: Delta:

Point: Island:

Side: Braiding: **0**

5.2 Other Features Neck Cutoff: **0**

Flood chutes: **0** Avulsion: **0**

5.3 Steep Riffles and Head Cuts Head Cuts: **0**

Steep Riffles: **0** Trib Rejuv.:

5.4 Stream Ford or Animal Crossing: **No**

5.5 Straightening: **None**

Straightening Length (ft.): **0**

5.5 Dredging: **None**

Step 6. Rapid Habitat Assessment Data

6.1 Epifaunal Substrate - Avl.:

6.2 Pool Substrate:

6.3 Pool Variability:

Total Score:

Habitat Rating:

Habitat Stream Condition:

6.4 Sediment Deposition:

6.5 Channel Flow Status:

6.6 Channel Alteration:

6.7 Channel Sinuosity:

Stream Gradiant Type Left Right

6.8 Bank Stability:

6.9 Bank Vegetation Protection

6.10 Riparian Veg. Zone Width:

Step 7. Rapid Geomorphic Assessment Data

Confinement Type	Score	STD	Historic		
7.1 Channel Degradation				Geomorphic Rating	
7.2 Channel Aggradation				Channel Evolution Model	
7.3 Widening Channel				Channel Evolution Stage	
7.4 Change in Planforml				Geomorphic Condition	
Total Score				Stream Sensitivity	