APPENDIX B

PHASE 2 GEOMORPHIC ASSESSMENT DATA AND OVERALL BASIN MAP

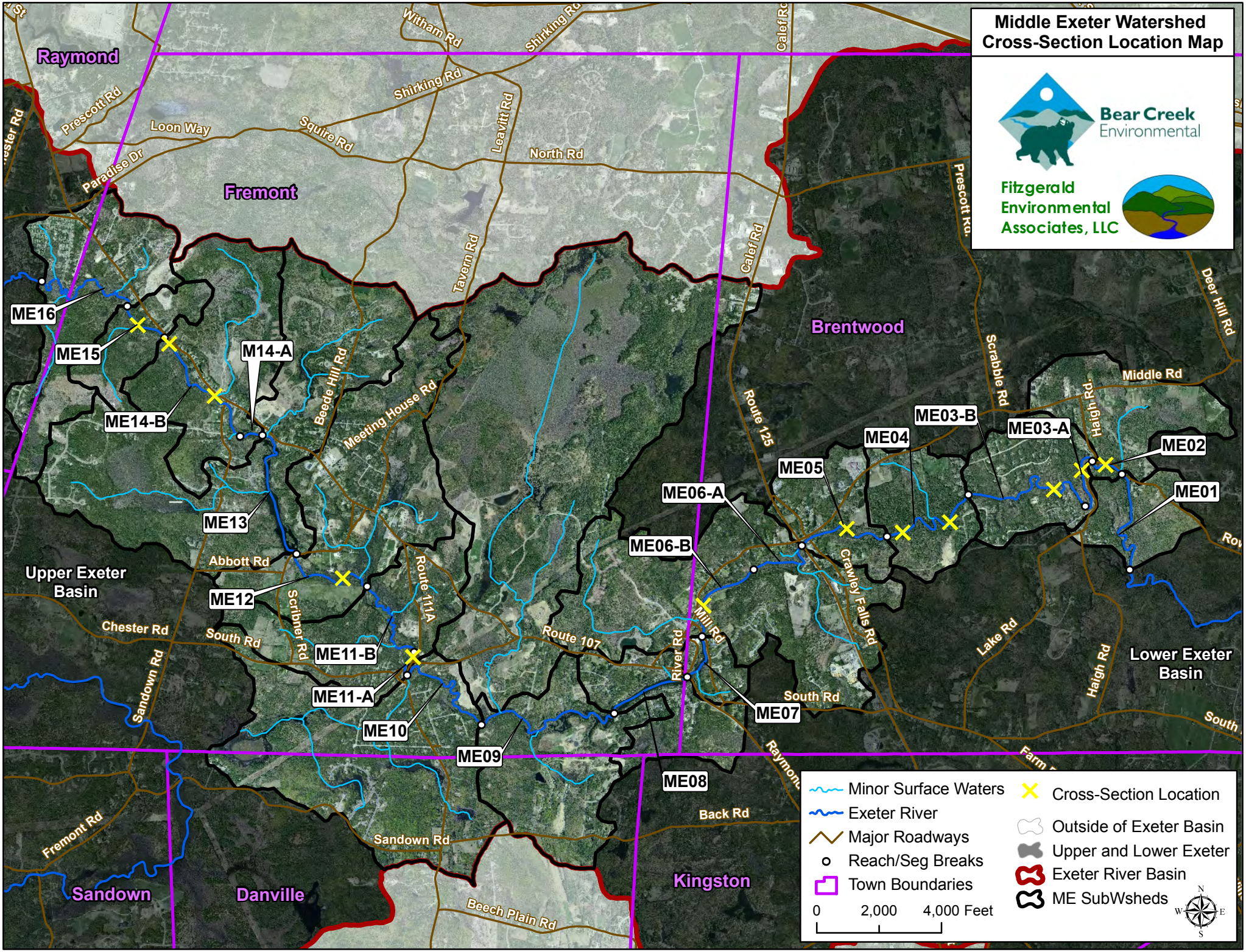
Middle Exeter Watershed
Cross-Section Location Map
Bear Creek Environmental
Fitzgerald Environmental Associates, LLC
Raymond
Fremont
Brentwood
Sandown
Danville
Kingston
Upper Exeter Basin
Lower Exeter Basin
ME16
ME15
ME14-B
M14-A
ME13
ME12
ME11-B
ME11-A
ME10
ME09
ME08
ME07
ME06-B
ME06-A
ME05
ME04
ME03-B
ME03-A
ME02
ME01
Witham Rd
Shirking Rd
Calef Rd
Prescott Rd
Loon Way
Squire Rd
Leavitt Rd
North Rd
Paradise Dr
Tavern Rd
Prescott Rd.
Deer Hill Rd
Scrabble Rd
Middle Rd
Haigh Rd
Beede Hill Rd
Meeting House Rd
Route 125
Abbott Rd
Route 111A
Scribner Rd
Chester Rd
South Rd
Sandown Rd
Route 107
River Rd
Mill Rd
Crawley Falls Rd
Lake Rd
Raymond
Back Rd
Fremont Rd
Beech Plain Rd
Minor Surface Waters
Exeter River
Major Roadways
Reach/Seg Breaks
Town Boundaries
0 2,000 4,000 Feet
Cross-Section Location
Outside of Exeter Basin
Upper and Lower Exeter
Exeter River Basin
ME SubWsheds
N
E
S
W

Table 1 (Appendix B) Reach and segment location summary table Middle Exeter River, NH

Town	Reach/Segment ID	Segment Location
Brentwood	ME01	Reach begins just upstream of confluence with Little River and continues until unnamed tributary that crosses Rowell Road
	ME02	Between unnamed tributary and Haigh Road crossing
	ME03-A	Upstream of Haigh Road crossing along road
	ME03-B	From where channel goes away from Haigh Road to more entrenched section
	ME04	Reach begins where stream is more entrenched and continues until about 1/2 mile downstream of Crawley Falls
	ME05	Reach is located below Crawley Falls and continues until Crawley Falls Road crossing
	ME06-A	Impounded area from beaver dam upstream of Crawley Falls Road
	ME06-B	Downstream of Exeter River Dam upstream of beaver dam impounded section
	ME07	Impounded section upstream of Exeter River Dam until Raymond Plaistow Road crossing
Fremont	ME08	Impounded section upstream of Raymond-Plaistow Road crossing where there is no buffer on both banks
	ME09	Continuation of impounded section upstream of no buffer area
	ME10	Partially impounded section downstream of Danville Road crossing
	ME11-A	Upstream of Danville Road crossing along road
	ME11-B	Wetland upstream of Danville Road crossing
	ME12	Downstream of Scribner Road Dam
	ME13	Impounded area influenced by Scribner Road Dam, reach ends 350 feet south of intersection of Route 107 and Spaulding Road
	ME14-A	Impounded area downstream of Sandown Road Crossing approximately 1,200 feet downstream of Sandown Road Crossing
	ME14-B	More entrenched section along Raymond-Plaistow Road ending about 1/2 mile upstream of Sandown Road crossing
	ME15	Short reach about 1/2 to 1 mile upstream of Sandown Road crossing
Fremont & Raymond	ME16	Reach begins where channel becomes more sinuous through wetland and continues until about 1 mile downstream of Blueberry Hill Road crossing

Table 2 (Appendix B) Phase 2 Reach Summary Statistics for the Middle Exeter River, Rockingham County, New Hampshire

Reach/ Segment ID	Segment Length (ft)	Watershed Area (sq mi)	Reference Condition	Phase 1 Confinement Type	Reference Bankfull Width (ft)	Adjusted Reference Bankfull Width (ft)#	Channel Dimensions			Channel & Floodplain Ratios			Existing Conditions			RGA† Condition	RHA† Condition	CEM‡	CEM‡ Stage	Stream Sensitivity
			Stream Type, Substrate, Bedform				Width (ft)	Mean Depth (ft)	Area (ft^2)	Width-to-Depth	Entrench-ment	Incision	Stream Type	Substrate	Bedform					
ME01*	4,173	64.0	E, Sand, Dune-Ripple	Very Broad	95.3	68.8	--	--	--	--	--	--	E	Sand	Dune-Ripple	Good	--	F	I	High
ME02	1,224	63.7	Bc, Cobble, Riffle-pool	Semi-Confined	95.1	68.6	75.0	3.1	235.5	23.9	1.7	1.1	Bc	Gravel	Riffle-Pool	Good	Fair	D	IIc	High
ME03-A	2,211	63.1	C, Gravel, Plane Bed	Narrow	94.7	68.3	62.0	3.4	213.3	18.0	4.3	1.1	C	Gravel	Plane Bed	Good	Fair	F	I	High
ME03-B	5,619	63.0	C, Sand, Riffle-Pool	Very Broad	94.6	68.3	62.7	4.1	257.1	15.3	12.8	1.0	C	Sand	Riffle-Pool	Good	Good	F	I	High
ME04	4,130	62.7	Bc, Gravel, Riffle-pool	Semi-Confined	94.4	68.1	62.7	3.4	212.6	18.5	1.8	1.0	Bc	Gravel	Riffle-Pool	Good	Good	F	I	High
ME05	3,195	62.2	Bc, Cobble, Riffle-pool	Narrow	94.1	67.9	85.0	2.3	194.7	37.1	2.0	1.0	Bc	Gravel	Riffle-Pool	Fair	Fair	D	IId	Very High
ME06-A*	2,371	61.9	E, Sand, Dune-ripple	Broad	93.8	67.7	--	--	--	--	--	--	E	Sand	Dune-Ripple	Good	--	F	I	High
ME06-B	3,156	61.2	C, Gravel, Riffle-Pool	Broad	93.3	67.3	70.5	3.0	208.7	23.8	5.9	1.7	C	Gravel	Riffle-Pool	Fair	Fair	F	III	Very High
ME07**	1,625	60.4	NA	Broad	92.7	66.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ME08**	2,745	60.2	NA	Very Broad	92.6	66.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ME09**	5,757	59.8	NA	Very Broad	92.3	66.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ME10*	4,421	56.0	E, Sand, Dune-ripple	Very Broad	89.3	64.4	--	--	--	--	--	--	E	Sand	Dune-Ripple	Fair	--	NA	NA	Extreme
ME11-A	918	54.5	C, Gravel, Riffle-Pool	Very Broad	88.1	63.6	54.0	3.0	160.9	18.1	10.5	1.3	C	Gravel	Plane Bed	Fair	Fair	F	II	Very High
ME11-B**	3,913	54.5	Wetland	Very Broad	88.2	63.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ME12	3,369	53.8	C, Sand, Riffle-Pool	Very Broad	87.6	63.2	77.0	2.7	205.6	28.8	4.1	1.1	C	Sand	Riffle-Pool	Fair	Fair	D	IIc	Very High
ME13**	4,728	52.6	NA	Broad	86.6	62.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ME14-A**	775	50.9	NA	Broad	85.2	61.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ME14-B	4,476	50.9	Bc, Gravel, Riffle-Pool	Narrow	85.3	61.5	67.3	2.81	189.1	24.0	1.8	1.0	Bc	Gravel	Riffle-Pool	Good	Fair	F	I	High
ME15	1,718	50.0	Bc, Gravel, Riffle-pool	Narrow	84.6	61.0	65.0	2.7	177.5	23.8	1.3	1.0	Bc	Gravel	Riffle-Pool	Good	Good	F	I	High
ME16*	5,273	49.8	E, Sand, Dune-Ripple	Very Broad	84.3	60.8	--	--	--	--	--	--	E	Sand	Dune-Ripple	Good	--	F	I	High

* Administrative Judgment used for determining stream type, RGA condition, channel evolution model/stage, and sensitivity for partially impounded reaches; ** No administrative judgment could be made given the extent of the impoundment/ponding

†RGA = Rapid Geomorphic Assessment, RHA = Rapid Habitat Assessment; ‡ CEM = Channel Evolution Model, # Adjusted bankfull channel width based on ratio between measured bankfull width and reference bankfull width (from hydraulic geometry curves) for stable segments within the study area

NA = Not Applicable

Table 3 (Appendix B) Summary of the Rapid Habitat Assessment (RHA) values for the Middle Exeter River, NH

Segment/ Reach ID	Reference Stream Type	Woody Debris Cover	Bed Substrate Cover	Scour and Depositional Features	Channel Morphology	Hydrologic Characteristics	Connectivity	River Banks Left	River Banks Right	Riparian Area Left	Riparian Area Right	Total Score	Percentage	Habitat Condition
ME01*	Dune-Ripple	--	--	--	--	--	--	--	--	--	--	0	0%	--
ME02	Riffle-Pool	14	12	12	13	15	11	6	8	4	8	103	64%	Fair
ME03-A	Plane Bed	15	13	10	12	12	9	7	5	9	3	95	59%	Fair
ME03-B	Riffle-Pool	19	15	13	18	17	15	5	5	8	8	123	77%	Good
ME04	Riffle-Pool	13	11	12	18	15	10	8	7	8	7	109	68%	Good
ME05	Riffle-Pool	15	14	10	11	10	10	6	6	5	5	92	58%	Fair
ME06-A*	Dune-Ripple	--	--	--	--	--	--	--	--	--	--	0	0%	--
ME06-B	Riffle-Pool	14	15	11	8	9	11	5	7	4	6	90	56%	Fair
ME07**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0%	NA
ME08**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0%	NA
ME09**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0%	NA
ME10*	Dune-Ripple	--	--	--	--	--	--	--	--	--	--	0	0%	--
ME11-A	Riffle-Pool	8	14	7	13	8	9	4	5	2	4	74	46%	Fair
ME11-B**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0%	NA
ME12	Riffle-Pool	14	13	12	12	13	7	6	6	8	8	99	62%	Fair
ME13**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0%	NA
ME14-A**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0%	NA
ME14-B	Riffle-Pool	11	11	13	14	14	13	6	7	5	7	101	63%	Fair
ME15	Riffle-Pool	10	13	10	15	19	14	7	7	6	10	111	69%	Good
ME16*	Dune-Ripple	--	--	--	--	--	--	--	--	--	--	0	0%	--
Total Possible Scores:		**20**	**20**	**20**	**20**	**20**	**20**	**10**	**10**	**10**	**10**	**160**	**100%**	**Reference**

* Administrative Judgment used for determining reference stream type for partially impounded reaches; ** No administrative judgment could be made given the extent of the impoundment/ponding; NA = Not Applicable

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME01	Segment:	0	Completion Date:	30-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	4,173	Segment Location:	From the confluence with the Little River to the reach break about 1000 ft downstream of the Haigh Rd. crossing.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	Left	Right
Berms	0	0
height	0	0
Roads	276	0
height	7	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Hilly
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Ph. 2 Valley Width (ft)		1000
Width Determination		Measured
Ph. 2 Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type		NA
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	5	%
Fine Gravel	15	%
Sand	50	%
Silt & Smaller	30	%
Silt/Clay Present		
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	45	%
# LWD	118	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	0	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:	NE	
2.15 Reference Stream Type		
E, Sand, Dune-Ripple		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-Cohesive	Non-Cohesive
Lower		
Material Type	Sand	Sand
Consistency	Non-Cohesive	Non-Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	625	282
Erosion Height (ft)	4.0	4.0
Revetment Type	Other	None
Revetment Length (ft)	148	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	85	0	50	50
R Trees	85	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	75	5	65	30
R Shrubs/Saplings	75	5	65	30

	% Cover	Invasive	Grasses	Forbs
L Herbs	80	0	40	60
R Herbs	80	0	40	60

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>100	>100
Sub-dominant	26-50	None
Length <25 ft	581	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	85	0	50	50
R Trees	85	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	75	5	40	55
R Shrubs/Saplings	75	5	40	55

	% Cover	Invasive	Grasses	Forbs
L Herbs	70	0	30	70
R Herbs	70	0	30	70

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Shrub/Sapling	Shrub/Sapling
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Extensive
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Low
4.4 # of Debris Jams	8
4.5 Flow Reg Type	Water Supply
4.6 Up/Downstream Flow Reg	Downstream

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	1	1	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME01	Segment:	0	Completion Date:	30-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	4,173	Segment Location:	From the confluence with the Little River to the reach break about 1000 ft downstream of the Haigh Rd. crossing.				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	NA	None	No
7.2 Channel Aggradation	NA	None	No
7.3 Widening Channel	NA	--	No
7.4 Change in Planform	NA	--	No
Total Score:	NA		
Geomorphic Rating:	NA		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	High		

Channel Adjustment Processes Narrative

Professional judgment was used to determine stream type, geomorphic condition rating, channel evolution model, and stream sensitivity.

Notes:

Channel is impounded and not actively adjusting. Impounded area extends from Pickpocket dam in the Lower Exeter study area up into the Middle Exeter study area. Impounded area extends to the west up to where Rowell Road encroaches on the channel.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME02	Segment:	0	Completion Date:	30-Sep-09
Organization:	FEA; BCE	Observers:	SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,224	Segment Location:	From bridge crossing at Haigh Road, to reach break with ME01, about 1000 feet downstream along E. Rowell Road.				

Step 1. Valley and Floodplain		
1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	Left	Right
Berms	0	0
height	0	0
Roads	1224	0
height	7	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	131
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Very Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	Bedrock	Bedrock
1.5 Valley Features		
Ph. 2 Valley Width (ft)		235
Width Determination		Measured
Ph. 2 Confinement Type		Semi-Confined
Rock Gorge?		No
Human Caused Change?		No
Step 2. Stream Channel		
2.1 Bankfull Width (ft)	75	
2.1a Wetted Width (ft)	66	
2.1b Ratio (wetted/bkfl)	0.88	
2.2 Max Depth (ft)	4.3	
2.3 Mean Depth (ft)	3.1	
2.4 Floodprone Width (ft)	126	
2.5 RAF	4.8	
*Human Elevated FP	NA	

Step 2. (Cont'd)		
2.6 Width/Depth Ratio		23.9
2.7 Entrenchment Ratio		1.7
2.8 Incision Ratio		1.1
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		175
2.12 Substrate Composition		
Bedrock	0	%
Boulder	2	%
Cobble	28	%
Coarse Gravel	42	%
Fine Gravel	8	%
Sand	20	%
Silt & Smaller	0	%
Silt/Clay Present	No	
Embedded (chan)	30	%
Embedded (marg)	45	%
Detritus	20	%
# LWD	17	
2.13 Average Largest Particle		
Bed	340	mm
Bar	40	mm
2.13a % Subs. Exp.	15	%
2.14 Stream Type		
Stream Type:	B	
Bed Material:	Gravel	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
Field Measured Slope:		NE
2.15 Reference Stream Type		
Bc, Cobble, Riffle-pool		
Step 3. Riparian Features		
3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)				
Bank Texture	Left		Right	
Upper				
Material Type	Sand		Sand	
Consistency	Non-cohesive		Non-cohesive	
Lower				
Material Type	Boulder/Cobble		Boulder/Cobble	
Consistency	Non-cohesive		Non-cohesive	
Bank Erosion	Left		Right	
Erosion Length (ft)	185		229	
Erosion Height (ft)	4		3	
Revetment Type	Rip-rap		None	
Revetment Length (ft)	101		0	
Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	65	0	10	90
R Trees	90	0	65	35
	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	85	0	80	20
R Shrubs/Saplings	55	0	25	75
	% Cover	Invasive	Grasses	Forbs
L Herbs	70	0	20	80
R Herbs	75	0	20	80
Bank Canopy	Left		Right	
Canopy %	51-75		76-100	
Mid-channel canopy	Open			
3.2 Riparian Buffer				
Buffer Width	Left		Right	
Dominant	0-25		>100	
Sub-dominant	51-100		26-50	
Length <25 ft	650		0	
Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	60	0	10	90
R Trees	95	0	70	30
	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	80	0	60	40
R Shrubs/Saplings	50	0	20	80
	% Cover	Invasive	Grasses	Forbs
L Herbs	70	0	20	80
R Herbs	70	0	20	80

3.3 Riparian Corridor		Left	Right
Corridor Land Use			
Dominant		Residential	Forest
Sub-dominant		Forest	Residential
Mass Failures (ft)		0	0
Height (ft)		0	0
Gullies (number)		0	0
Height (ft)		0	0
Step 4. Flow & Flow Modifiers			
4.1 Springs/ Seeps		Present	
4.2 Adjacent Wetlands		None	
4.3 Flow Status		Base	
4.4 # of Debris Jams		1	
4.5 Flow Reg Type		None	
4.6 Up/Downstream Flow Reg		None	
4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	2
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0
4.9 # of Beaver Dams		0	
Affected Length (ft)			
Step 5. Channel Bed & Planform Changes			
5.1 Bar Types	Mid	Point	Side
	0	2	0
	Diagonal	Delta	Island
	0	0	0
5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		
5.3 Steep Riffles & Headcuts			
	# SRs	# HCs	Trib Rejuv.
	2	0	No
5.4 Stream Ford or Animal Crossing:			None
5.5 Straightening	None		
Length (ft)			
5.5 Dredging	None		
Bridge and Culvert Survey		No	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME02	Segment:	0	Completion Date:	30-Sep-09
Organization:	FEA; BCE	Observers:	SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	1,224	Segment Location:	From bridge crossing at Haigh Road, to reach break with ME01, about 1000 feet downstream along E. Rowell Road.				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point
Ledge	upstream	2.3	0.3	Yes	Yes

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Confined

	Score	STD	Historic
7.1 Channel Degradation	15	None	No
7.2 Channel Aggradation	14	None	No
7.3 Widening Channel	13		No
7.4 Change in Planform	13		No
Total Score:	55		
Geomorphic Rating:	0.69		
Channel Evolution Model	D		
Channel Evolution Stage	IIc		
Geomorphic Condition	Good		
Stream Sensitivity	High		

Channel Adjustment Processes Narrative

Some aggradation in the upper reach, with minor widening and planform shifts from the encroachment on the right bank. Two steep riffles were observed on this reach in the widened area downstream of the large bend.

Notes:

Nice riffle-pool bedform with several deep pools and complete riffles. The left bank is encroached upon by Rowell Road and armored in one location. The right bank has a very wide buffer with only one small area of development just downstream of Haigh Road. The upstream end of the reach had dense growth of algae near the USGS gage. Field evidence noted of historic crib dam structure on the right bank, although the dam location in the GIS layer is 220 feet downstream of the actual structure location.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME03	Segment:	A	Completion Date:	1-Oct-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	2,211	Segment Location:	From the reach break at the Haigh Road crossing to north of the Haigh Road and Ole Gordon Road Intersection.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right
1.1 Segmentation:		CE	2.6 Width/Depth Ratio		18.0	*Bank Texture*	Left		Right		Corridor Land Use		
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		4.3	Upper					Dominant	Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio		1.1	Material Type	Sand		Sand		Sub-dominant	None	Residential
Length (ft)	Left	Right	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0
Berms	0	0	2.9 Sinuosity		Low (<1.2)	Lower					Height (ft)	0	0
height	0	0	2.10 Riffle Type		NA	Material Type	Sand		Sand		Gullies (number)	0	0
Roads	0	2072	2.11 Riffle Step Spacing		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)	0	0
height	0	8	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**		
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	0		389		4.1 Springs/ Seeps	Present	
height	0	0	Boulder	4	%	Erosion Height (ft)	0		3		4.2 Adjacent Wetlands	Present	
Improved Paths	0	0	Cobble	41	%	Revetment Type	None		Rip-rap		4.3 Flow Status	Low	
height	0	0	Coarse Gravel	27	%	Revetment Length (ft)	0		115		4.4 # of Debris Jams	0	
Development	0	0	Fine Gravel	8	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None	
1.4 Adjacent Side	Left	Right	Sand	17	%	**L** Trees	75	0	20	80	4.6 Up/Downstream Flow Reg	None	
Hillside Slope	Steep	Steep	Silt & Smaller	2	%	**R** Trees	75	0	20	80	4.7 Stormwater Inputs		
Continuous	Sometimes	Sometimes	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch 0
W/in 1 bnkfl	Sometimes	Sometimes	Embedded (chan)	30	%	**L** Shrubs/Saplings	40	10	20	70	Urban Storm Pipe	0	Tile Drain 0
Texture	NE	Sand	Embedded (marg)	40	%	**R** Shrubs/Saplings	40	10	20	70	Overland Flow	0	Other 0
1.5 Valley Features			Detritus	15	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0	
Ph. 2 Valley Width (ft)		335	# LWD	21		**L** Herbs	80	20	30	50	Affected Length (ft)	NA	
Width Determination		Measured	2.13 Average Largest Particle			**R** Herbs	80	30	20	50	**Step 5. Channel Bed & Planform Changes**		
Ph. 2 Confinement Type		Narrow	Bed	360	mm	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		76-100			0	0 0
Human Caused Change?		Yes	2.13a % Subs. Exp.	18	%	Mid-channel canopy	Open					Diagonal	Delta Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0 0
2.1 Bankfull Width (ft)	62.0		Stream Type:	C		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO Avulsion
2.1a Wetted Width (ft)	51.5		Bed Material:	Gravel		Dominant	>100		26-50			1	0 0
2.1b Ratio (wetted/bkfl)	0.83		Subclass Slope:	None		Sub-dominant	None		51-100			Braiding	
2.2 Max Depth (ft)	4.3		Bed Form:	Plane Bed		Length <25 ft	0		0			0	
2.3 Mean Depth (ft)	3.4		Field Measured Slope:		NE	Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts		
2.4 Floodprone Width (ft)	269		2.15 Reference Stream Type			**L** Trees	100	0	60	40		# SRs	# HCs Trib Rejuv.
2.5 RAF	4.9		C, Gravel, Plane Bed			**R** Trees	60	0	50	50		1	0 No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:		None
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	50	10	10	80	5.5 Straightening	None	
			Typical Bank Slope	Steep	Steep	**R** Shrubs/Saplings	60	20	20	60	Length (ft)	0	
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None	
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	40	10	10	80			
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	60	50	25	25	Bridge and Culvert Survey	Yes	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME03	Segment:	A	Completion Date:	1-Oct-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	2,211	Segment Location:	From the reach break at the Haigh Road crossing to north of the Haigh Road and Ole Gordon Road Intersection.				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS

4.8 Channel Constrictions **Present**

Type	Width	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	40	Yes	Yes	Yes	Yes
	Problems:	None			

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Plane bed

	Score	STD	Historic
7.1 Channel Degradation	13	None	No
7.2 Channel Aggradation	14	None	No
7.3 Widening Channel	15		No
7.4 Change in Planform	14		No
Total Score:	56		
Geomorphic Rating:	0.70		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good (0.65-0.84)		
Stream Sensitivity	High		

Channel Adjustment Processes Narrative

No channel evolution or evidence of major incision, but channel is encroached upon by Haigh Road.

Notes:

Segmented out because corridor encroachments from Haigh Road. Only one riffle present in reach, channel has plane bed bedform by reference due to the narrow valley setting.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME03	Segment:	B	Completion Date:	30-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	5,619	Segment Location:	From the seg. break north of the Haigh Road Ole Gordon Road intersection to the reach break due south of Block Drive.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right
1.1 Segmentation:		VW	2.6 Width/Depth Ratio		15.3	*Bank Texture*	Left		Right		*Corridor Land Use*		
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		12.8	Upper					Dominant	Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio		1.0	Material Type	Sand		Sand		Sub-dominant	Residential	Residential
Length (ft)	Left	Right	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	90
Berms	0	0	2.9 Sinuosity	Moderate (1.2-1.5)		Lower					Height (ft)	0	20
height	0	0	2.10 Riffle Type		Complete	Material Type	Sand		Sand		Gullies (number)	0	0
Roads	0	0	2.11 Riffle Step Spacing		520	Consistency	Non-cohesive		Non-cohesive		Height (ft)	0	0
height	0	0	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**		
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	1293		863		4.1 Springs/ Seeps	Extensive	
height	0	0	Boulder	0	%	Erosion Height (ft)	5.4		5.6		4.2 Adjacent Wetlands	Extensive	
Improved Paths	0	0	Cobble	0	%	Revetment Type	None		None		4.3 Flow Status	Low	
height	0	0	Coarse Gravel	0	%	Revetment Length (ft)	0		0		4.4 # of Debris Jams	13	
Development	347	270	Fine Gravel	18	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None	
1.4 Adjacent Side	Left	Right	Sand	62	%	**L** Trees	70	0	30	70	4.6 Up/Downstream Flow Reg	None	
Hillside Slope	Steep	Steep	Silt & Smaller	20	%	**R** Trees	75	0	50	50	4.7 Stormwater Inputs		
Continuous	Sometimes	Sometimes	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch 0
W/in 1 bnkfl	Sometimes	Sometimes	Embedded (chan)	NA	%	**L** Shrubs/Saplings	75	10	60	30	Urban Storm Pipe	0	Tile Drain 0
Texture	Clay	Clay	Embedded (marg)	NA	%	**R** Shrubs/Saplings	75	10	60	30	Overland Flow	0	Other 0
1.5 Valley Features			Detritus	15	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0	
Ph. 2 Valley Width (ft)		760	# LWD	257		**L** Herbs	70	10	45	45	Affected Length (ft)	NA	
Width Determination		Measured	2.13 Average Largest Particle			**R** Herbs	70	10	40	50	**Step 5. Channel Bed & Planform Changes**		
Ph. 2 Confinement Type		Very Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	51-75		51-75			2	2	1
Human Caused Change?		No	2.13a % Subs. Exp.	10	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						1	1	0
2.1 Bankfull Width (ft)	62.7		Stream Type:	C		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	34		Bed Material:	Sand		Dominant	>100		>100			1	1	1
2.1b Ratio (wetted/bkfl)	0.54		Subclass Slope:	None		Sub-dominant	51-100		51-100			Braiding		
2.2 Max Depth (ft)	5.8		Bed Form:	Riffle-Pool		Length <25 ft	0		0			0		
2.3 Mean Depth (ft)	4.1		Field Measured Slope:	No		Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	805		2.15 Reference Stream Type			**L** Trees	80	0	40	60		# SRs	# HCs	Trib Rejuv.
2.5 RAF	5.8		C, Sand, Riffle-Pool			**R** Trees	85	0	50	50		1	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	70	10	50	40	5.5 Straightening	None		
			Typical Bank Slope	Steep	Steep	**R** Shrubs/Saplings	70	10	45	45	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	65	10	30	60				
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	65	10	30	60	Bridge and Culvert Survey		No	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME03	Segment:	B	Completion Date:	6-Oct-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	5,619	Segment Location:	From the seg. break north of the Haigh Road Ole Gordon Road intersection to the reach break due south of Block Drive.				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

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

Channel Adjustment Processes Narrative

Old channel in left corridor in lower segment. ME03-B is stable and has a high amount of LWD and debris jams that increase bed resistance. Floodplain is accessible. Avulsion noted in lower reach is historical (not reflective of current channel processes) and now functions as a flood chute.

Notes:

Isolated segment with lots of wood. Buffer exceeds 100 feet over much of the reach and the attenuation potential for woody debris is extremely high.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME04	Segment:	0	Completion Date:	6-Oct-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	4,130	Segment Location:	From just south of Block Drive up to the reach break at a very large debris jam and slight change in confinement.				

Step 1. Valley and Floodplain		
1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	Left	Right
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	160	680
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	Sand	Sand
1.5 Valley Features		
Ph. 2 Valley Width (ft)		245
Width Determination		Measured
Ph. 2 Confinement Type		Semi-Confined
Rock Gorge?		No
Human Caused Change?		No
Step 2. Stream Channel		
2.1 Bankfull Width (ft)	62.7	
2.1a Wetted Width (ft)	55	
2.1b Ratio (wetted/bkfl)	0.88	
2.2 Max Depth (ft)	4.4	
2.3 Mean Depth (ft)	3.4	
2.4 Floodprone Width (ft)	115	
2.5 RAF	4.4	
*Human Elevated FP	NA	

Step 2. (Cont'd)		
2.6 Width/Depth Ratio		18.5
2.7 Entrenchment Ratio		1.8
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		455
2.12 Substrate Composition		
Bedrock	0	%
Boulder	3	%
Cobble	21	%
Coarse Gravel	34	%
Fine Gravel	13	%
Sand	17	%
Silt & Smaller	12	%
Silt/Clay Present	Yes	
Embedded (chan)	30	%
Embedded (marg)	60	%
Detritus	15	%
# LWD	47	
2.13 Average Largest Particle		
Bed	280	mm
Bar	100	mm
2.13a % Subs. Exp.	5	%
2.14 Stream Type		
Stream Type:	B	
Bed Material:	Gravel	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
Field Measured Slope:		NE
2.15 Reference Stream Type		
Bc, Gravel, Riffle-pool		
Step 3. Riparian Features		
3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)				
Bank Texture	Left		Right	
Upper				
Material Type	Sand		Sand	
Consistency	Non-cohesive		Non-cohesive	
Lower				
Material Type	Gravel		Gravel	
Consistency	Non-cohesive		Non-cohesive	
Bank Erosion	Left		Right	
Erosion Length (ft)	924		148	
Erosion Height (ft)	3.7		6	
Revetment Type	None		None	
Revetment Length (ft)	0		0	
Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	55	45
R Trees	90	0	65	35
	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	40	5	20	75
R Shrubs/Saplings	40	5	20	75
	% Cover	Invasive	Grasses	Forbs
L Herbs	30	10	25	65
R Herbs	30	10	25	65
Bank Canopy	Left		Right	
Canopy %	76-100		76-100	
Mid-channel canopy	Open			
3.2 Riparian Buffer				
Buffer Width	Left		Right	
Dominant	>100		>100	
Sub-dominant	51-100		51-100	
Length <25 ft	109		0	
Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	60	40
R Trees	90	0	75	25
	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	50	5	10	85
R Shrubs/Saplings	50	5	15	80
	% Cover	Invasive	Grasses	Forbs
L Herbs	30	10	15	75
R Herbs	30	10	15	75

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	Residential
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0
Step 4. Flow & Flow Modifiers		
4.1 Springs/ Seeps	Present	
4.2 Adjacent Wetlands	Minimum	
4.3 Flow Status	Low	
4.4 # of Debris Jams	0	
4.5 Flow Reg Type	Recreation	
4.6 Up/Downstream Flow Reg	None	
4.7 Stormwater Inputs		
Field Ditch	0	Road Ditch 0
Urban Storm Pipe	0	Tile Drain 0
Overland Flow	0	Other 0
4.9 # of Beaver Dams	0	
Affected Length (ft)	NA	
Step 5. Channel Bed & Planform Changes		
5.1 Bar Types	Mid	Point	Side
	1	2	0
	Diagonal	Delta	Island
	0	0	0
5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		
5.3 Steep Riffles & Headcuts			
	# SRs	# HCs	Trib Rejuv.
	0	0	No
5.4 Stream Ford or Animal Crossing:			None
5.5 Straightening	None		
Length (ft)	0		
5.5 Dredging	None		
Bridge and Culvert Survey		No	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME04	Segment:	0	Completion Date:	6-Oct-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	4,130	Segment Location:	From just south of Block Drive up to the reach break at a very large debris jam and slight change in confinement.				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Confined

	Score	STD	Historic
7.1 Channel Degradation	16	None	No
7.2 Channel Aggradation	16	None	No
7.3 Widening Channel	16		No
7.4 Change in Planform	17		No
Total Score:	65		
Geomorphic Rating:	0.81		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	High		

Channel Adjustment Processes Narrative

Channel is stable with no significant adjustments observed.

Notes:

Channel has an excellent riparian buffer. Nearly entire river corridor on north side of channel is protected by conserved lands. NH Conserved Lands database notes the conservation program as "DES Water Supply Land Grant Program".

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME05	Segment:	0	Completion Date:	30-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	3,195	Segment Location:	From the reach break with ME04 up to the reach break at the Route 125 crossing.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right		
1.1 Segmentation:		None	2.6 Width/Depth Ratio		37.1	*Bank Texture*	Left		Right		Corridor Land Use				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		2.0	Upper					Dominant	Forest	Forest		
1.3 Corridor Encroachments:			2.8 Incision Ratio		1.0	Material Type	Sand		Sand		Sub-dominant	Residential	Residential		
Length (ft)	Left	Right	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	40		
Berms	0	0	2.9 Sinuosity		Low (<1.2)	Lower					Height (ft)	0	18		
height	0	0	2.10 Riffle Type		Complete	Material Type	Gravel		Gravel		Gullies (number)	0	0		
Roads	604	0	2.11 Riffle Step Spacing		410	Consistency	Non-cohesive		Non-cohesive		Height (ft)	0	0		
height	15	0	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	527		0		4.1 Springs/ Seeps	Present			
height	0	0	Boulder	6	%	Erosion Height (ft)	5		0		4.2 Adjacent Wetlands	None			
Improved Paths	0	0	Cobble	38	%	Revetment Type	Rip-rap		Hard Bank		4.3 Flow Status	Low			
height	0	0	Coarse Gravel	27	%	Revetment Length (ft)	380		339		4.4 # of Debris Jams	3			
Development	1183	446	Fine Gravel	9	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None			
1.4 Adjacent Side	Left	Right	Sand	11	%	**L** Trees	80	0	40	60	4.6 Up/Downstream Flow Reg	None			
Hillside Slope	Very Steep	Steep	Silt & Smaller	9	%	**R** Trees	80	0	60	40	4.7 Stormwater Inputs				
Continuous	Sometimes	Sometimes	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	2	
W/in 1 bnkfl	Sometimes	Sometimes	Embedded (chan)	35	%	**L** Shrubs/Saplings	70	10	50	40	Urban Storm Pipe	0	Tile Drain	0	
Texture	NE	Sand	Embedded (marg)	55	%	**R** Shrubs/Saplings	65	10	45	45	Overland Flow	0	Other	0	
1.5 Valley Features			Detritus	15	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		0		
Ph. 2 Valley Width (ft)		280	# LWD	57		**L** Herbs	70	10	40	50	Affected Length (ft)		NA		
Width Determination		Measured	2.13 Average Largest Particle			**R** Herbs	70	10	40	50	**Step 5. Channel Bed & Planform Changes**				
Ph. 2 Confinement Type		Semi-Confined	Bed	350	mm	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side	
Rock Gorge?		No	Bar	90	mm	Canopy %	76-100		76-100			2	2	1	
Human Caused Change?		Yes	2.13a % Subs. Exp.	35	%	Mid-channel canopy	Open					Diagonal	Delta	Island	
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						2	0	4	
2.1 Bankfull Width (ft)	85		Stream Type:	B		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion	
2.1a Wetted Width (ft)	43		Bed Material:	Gravel		Dominant	>100		>100			3	0	0	
2.1b Ratio (wetted/bkfl)	0.51		Subclass Slope:	c		Sub-dominant	26-50		26-50			Braiding			
2.2 Max Depth (ft)	3.6		Bed Form:	Riffle-Pool		Length <25 ft	351		345			2			
2.3 Mean Depth (ft)	2.3		Field Measured Slope:		NE	*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	173		2.15 Reference Stream Type			**L** Trees	75	0	40	60		# SRs	# HCs	Trib Rejuv.	
2.5 RAF	3.6		Bc, Cobble, Riffle-pool			**R** Trees	85	0	60	40		4	0	No	
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None	
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	60	10	40	50	5.5 Straightening	None			
			Typical Bank Slope	Steep	Steep	**R** Shrubs/Saplings	70	5	30	65	Length (ft)				
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None		
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	70	5	35	60					
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	75	5	35	60	Bridge and Culvert Survey		Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME05	Segment:	0	Completion Date:	30-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	3,195	Segment Location:	From the reach break with ME04 up to the reach break at the Route 125 crossing.				

1.6 Grade Controls **Present**

Type	Location	Total Ht	Ht Above	Photo	GPS Point
Ledge	Upstream	1.5	0.5	Yes	Yes
Waterfall	Upstream	14.3	5.8	Yes	Yes
Waterfall	Upstream	5.4	2.2	Yes	Yes

4.8 Channel Constrictions **Present**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	31	Yes	Yes	Yes	Yes
	Problems:	None			
Bridge	32	Yes	Yes	Yes	Yes
	Problems:	None			
Old Abutment	72	Yes	Yes	Yes	Yes
	Problems:	DA			

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Confined

	Score	STD	Historic
7.1 Channel Degradation	14	None	No
7.2 Channel Aggradation	5	None	No
7.3 Widening Channel	10		No
7.4 Change in Planform	5		No
Total Score:	34		
Geomorphic Rating:	0.43		
Channel Evolution Model	D		
Channel Evolution Stage	IId		
Geomorphic Condition	Fair		
Stream Sensitivity	Very High		

Channel Adjustment Processes Narrative

Aggradation and shifts in planform put the channel in stage IId of the CEM.

Notes:

Reach has a lot of aggradation and is experiencing shifts in planform. Downstream of Crawley Falls the channel is bifurcated with several island bars and steep riffles. Mid-segment there are two large diagonal bars and steep riffles at old abutments. The thalweg is diverted into the bank in many areas. No field evidence of historic dam ("Johanon Dam") noted in GIS dams layer, however old dam abutments were noted much further upstream (approx. 900 ft downstream of Crawly Falls)

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME06	Segment:	A	Completion Date:	30-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	2,371	Segment Location:	From the reach break at the Route 125 crosing up to the change in slope, mid-reach.				

Step 1. Valley and Floodplain		
1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	Left	Right
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	168	538
1.4 Adjacent Side	Left	Right
Hillside Slope	Hilly	Steep
Continuous	Never	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Ph. 2 Valley Width (ft)		560
Width Determination		Measured
Ph. 2 Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No
Step 2. Stream Channel		
2.1 Bankfull Width (ft)	NA	
2.1a Wetted Width (ft)	NA	
2.1b Ratio (wetted/bkfl)	NA	
2.2 Max Depth (ft)	NA	
2.3 Mean Depth (ft)	NA	
2.4 Floodprone Width (ft)	NA	
2.5 RAF	NA	
*Human Elevated FP	NA	

Step 2. (Cont'd)		
2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type		NA
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	5	%
Fine Gravel	25	%
Sand	40	%
Silt & Smaller	30	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	0	%
# LWD	0	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	0	%
2.14 Stream Type		
Stream Type:	E	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Dune-Ripple	
Field Measured Slope:	NE	
2.15 Reference Stream Type		
E, Sand, Dune-ripple		
Step 3. Riparian Features		
3.1 Stream Banks	Left	Right
Typical Bank Slope	Moderate	Moderate

Step 3. (Cont'd)				
Bank Texture	Left		Right	
Upper				
Material Type	Silt		Silt	
Consistency	Non-cohesive		Non-cohesive	
Lower				
Material Type	Sand		Sand	
Consistency	Non-cohesive		Non-cohesive	
Bank Erosion	Left		Right	
Erosion Length (ft)	0		0	
Erosion Height (ft)	0.0		0.0	
Revetment Type	None		None	
Revetment Length (ft)	0		0	
Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	60	0	0	100
R Trees	55	0	0	100
	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	95	10	70	20
R Shrubs/Saplings	85	10	70	20
	% Cover	Invasive	Grasses	Forbs
L Herbs	70	10	50	40
R Herbs	60	10	50	40
Bank Canopy	Left		Right	
Canopy %	51-75		51-75	
Mid-channel canopy	Open			
3.2 Riparian Buffer				
Buffer Width	Left		Right	
Dominant	>100		>100	
Sub-dominant	None		0-25	
Length <25 ft	178		440	
Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	0	100
R Trees	80	0	10	90
	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	80	10	80	10
R Shrubs/Saplings	70	10	80	10
	% Cover	Invasive	Grasses	Forbs
L Herbs	80	10	30	60
R Herbs	70	10	30	60

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	None	Residential
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0
Step 4. Flow & Flow Modifiers		
4.1 Springs/ Seeps	Present	
4.2 Adjacent Wetlands	Extensive	
4.3 Flow Status	Low	
4.4 # of Debris Jams	1	
4.5 Flow Reg Type	Hydro-Electric	
4.6 Up/Downstream Flow Reg	Upstream	
4.7 Stormwater Inputs		
Field Ditch	0	Road Ditch 0
Urban Storm Pipe	0	Tile Drain 0
Overland Flow	0	Other 0
4.9 # of Beaver Dams	1	
Affected Length (ft)	2371	
Step 5. Channel Bed & Planform Changes		
5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0
5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		
5.3 Steep Riffles & Headcuts			
	# SRs	# HCs	Trib Rejuv.
	0	0	No
5.4 Stream Ford or Animal Crossing:			None
5.5 Straightening	None		
Length (ft)			
5.5 Dredging	None		
Bridge and Culvert Survey		No	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME06	Segment:	A	Completion Date:	29-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	
Segment Length (ft):	2,371	Segment Location:	From the reach break at the Route 125 crosing up to the change in slope, mid-reach.				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	NA	None	No
7.2 Channel Aggradation	NA	None	No
7.3 Widening Channel	NA		No
7.4 Change in Planform	NA		No
Total Score:	NA		
Geomorphic Rating:	NA		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	High		

Channel Adjustment Processes Narrative

Professional judgment was used to determine stream type, geomorphic condition rating, and stream sensitivity.

Notes:

Segment impounded by beaver dam built on boulder riffle at Route 125 bridge. Slow moving water throughout with low bank height. The majority of the segment is well buffered, except a small area on the downstream right bank near a house and the access to a gravel pit. No field evidence of historic dam ("Rowe Dam") noted in GIS dams layer.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME06	Segment:	B	Completion Date:	29-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	3,156	Segment Location:	From the segment break located mid-reach to the reach break just upsteram of the Mill Road Crossing.				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	Left	Right
Berms	0	0
height	0	0
Roads	664	0
height	10	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	1090	147
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Hilly
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Ph. 2 Valley Width (ft)		470
Width Determination		Measured
Ph. 2 Confinement Type		Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	70.5
2.1a Wetted Width (ft)	64
2.1b Ratio (wetted/bkfl)	0.91
2.2 Max Depth (ft)	3.9
2.3 Mean Depth (ft)	3.0
2.4 Floodprone Width (ft)	419
2.5 RAF	6.6
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		23.8
2.7 Entrenchment Ratio		5.9
2.8 Incision Ratio		1.7
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		365
2.12 Substrate Composition		
Bedrock	0	%
Boulder	6	%
Cobble	35	%
Coarse Gravel	39	%
Fine Gravel	6	%
Sand	13	%
Silt & Smaller	1	%
Silt/Clay Present	Yes	
Embedded (chan)	35	%
Embedded (marg)	55	%
Detritus	20	%
# LWD	56	
2.13 Average Largest Particle		
Bed	350	mm
Bar	NA	mm
2.13a % Subs. Exp.	15	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slope:	NE	
2.15 Reference Stream Type		
C, Gravel, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Mix	Mix
Consistency	Non-Cohesive	Non-Cohesive
Lower		
Material Type	Boulder/Cobble	Boulder/Cobble
Consistency	Non-Cohesive	Non-Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	124	34
Erosion Height (ft)	3.5	3.0
Revetment Type	Rip-rap	Rip-rap
Revetment Length (ft)	534	277

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	70	10	30	60
R Trees	90	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	40	40	20
R Shrubs/Saplings	80	10	10	80

	% Cover	Invasive	Grasses	Forbs
L Herbs	50	0	40	60
R Herbs	40	0	30	70

Bank Canopy	Left	Right
Canopy %	51-75	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	51-100	51-100
Sub-dominant	0-25	26-50
Length <25 ft	1036	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	60	10	20	70
R Trees	60	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	70	60	20	20
R Shrubs/Saplings	60	10	20	70

	% Cover	Invasive	Grasses	Forbs
L Herbs	50	50	20	30
R Herbs	80	60	30	10

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Residential	Forest
Sub-dominant	Shrub/Sapling	Hay
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	1
Height (ft)	0	10

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Minimum
4.2 Adjacent Wetlands	Minimum
4.3 Flow Status	Low
4.4 # of Debris Jams	1
4.5 Flow Reg Type	Hydro-Electric
4.6 Up/Downstream Flow Reg	Upstream

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	NA

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	2

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts		
# SRs	# HCs	Trib Rejuv.
2	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	1533
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	1-Feb-10
Stream:	Exeter River	Reach #:	ME06	Segment:	B	Completion Date:	29-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	3,156	Segment Location:	From the segment break located mid-reach to the reach break just upsteram of the Mill Road Crossing.				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point
Ledge	Upstream	2.9	1	Yes	Yes

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Arch	32	Yes	Yes	Yes	Yes
	Problems:	None			

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	11	None	Yes
7.2 Channel Aggradation	10	None	No
7.3 Widening Channel	11		No
7.4 Change in Planform	11		No
Total Score:	43		
Geomorphic Rating:	0.54		
Channel Evolution Model	F		
Channel Evolution Stage	III		
Geomorphic Condition	Fair		
Stream Sensitivity	Very High		

Channel Adjustment Processes Narrative

Aggradation and planform adjustments may be related to past flood events and sediment working through the reach. Historical photos from 1962 and 1974 reveal that the hayfield in the right corridor was forested in the 60's and 70's. Historical straightening along this section of reach likely, and therefore incision is likely historic.

Notes:

Mill road crossing is an arch which acts as a bankfull constriction, but limited erosion problems because of bedrock controls. Downstream of the Mill Road crossing there is some aggradation and a few prominent island bars. Channel may have some historic degradation arrested by bedrock outcrops.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME07	Segment:	0	Completion Date:	29-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	1,625	Segment Location:	From just upstream of the Mill Road crossing to the reach above the Route 107 crossing.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right		
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		*Corridor Land Use*				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Residential	Residential		
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	Industrial	Forest		
Length (ft)	Left	Right	*Human Elevated Incision		NA	Consistency	Non-Cohesive		Non-Cohesive		Mass Failures (ft)	0	0		
Berms	0	0	2.9 Sinuosity		Low (<1.2)	Lower					Height (ft)	0	0		
height	0	0	2.10 Riffle Type		NA	Material Type	Sand		Sand		Gullies (number)	0	0		
Roads	1505	914	2.11 Riffle Step Spacing		NA	Consistency	Non-Cohesive		Non-Cohesive		Height (ft)	0	0		
height	8	5	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Minimum			
height	0	0	Boulder	0	%	Erosion Height (ft)	0.0		0.0		4.2 Adjacent Wetlands	Present			
Improved Paths	0	0	Cobble	0	%	Revetment Type	Rip-rap		Rip-rap		4.3 Flow Status	Low			
height	0	0	Coarse Gravel	0	%	Revetment Length (ft)	152		211		4.4 # of Debris Jams	0			
Development	893	1088	Fine Gravel	0	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	Hydro-Electric			
1.4 Adjacent Side	Left	Right	Sand	55	%	**L** Trees	75	0	35	65	4.6 Up/Downstream Flow Reg	Downstream			
Hillside Slope	Hilly	Hilly	Silt & Smaller	45	%	**R** Trees	65	0	50	50	4.7 Stormwater Inputs				
Continuous	Sometimes	Never	Silt/Clay Present				% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	1	
W/in 1 bnkfl	Sometimes	Sometimes	Embedded (chan)	NA	%	**L** Shrubs/Saplings	75	10	45	45	Urban Storm Pipe	0	Tile Drain	0	
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrubs/Saplings	80	10	50	40	Overland Flow	0	Other	0	
1.5 Valley Features			Detritus	30	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		0		
Ph. 2 Valley Width (ft)		410	# LWD	NE		**L** Herbs	70	0	50	50	Affected Length (ft)				
Width Determination		Measured	2.13 Average Largest Particle			**R** Herbs	70	5	35	60	**Step 5. Channel Bed & Planform Changes**				
Ph. 2 Confinement Type		Narrow	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side	
Rock Gorge?		No	Bar	NA	inches	Canopy %	51-75		26-50			0	0	0	
Human Caused Change?		Yes	2.13a % Subs. Exp.	0	%	Mid-channel canopy	Open					Diagonal	Delta	Island	
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0	
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion	
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	0-25		0-25			0	0	0	
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	26-50		>100			Braiding			
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	932		808			0			
2.3 Mean Depth (ft)	NA		Field Measured Slope:			Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			**L** Trees	65	0	35	65		# SRs	# HCs	Trib Rejuv.	
2.5 RAF	NA		NA			**R** Trees	45	0	45	55		0	0	No	
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None	
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	65	10	30	60	5.5 Straightening	None			
			Typical Bank Slope	Steep	Steep	**R** Shrubs/Saplings	45	10	30	60	Length (ft)				
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None		
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	60	10	40	50					
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	45	10	40	50	Bridge and Culvert Survey		Yes		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	1-Feb-10
Stream:	Exeter River	Reach #:	ME07	Segment:	0	Completion Date:	29-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	1,625	Segment Location:	From just upstream of the Mill Road crossing to the reach above the Route 107 crossing.				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point
Dam	Downstream	17	14	Yes	Yes

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	42	Yes	Yes	Yes	Yes

Problems: None

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	NA	None	No
7.2 Channel Aggradation	NA	None	No
7.3 Widening Channel	NA	--	No
7.4 Change in Planform	NA	--	No
Total Score:	NA		
Geomorphic Rating:	NA		
Channel Evolution Model	NA		
Channel Evolution Stage	NA		
Geomorphic Condition	NA		
Stream Sensitivity	NA		

Channel Adjustment Processes Narrative

Reach impounded. No professional judgment could be made because of extent of ponding. No administrative judgment was used to determine RGA or RHA scores. Reference stream typing not possible and therefore no default FEH corridor developed.

Notes:

Reach impounded in its entirety by the dam along Mill Road. Reach banks are well vegetated and buffered in the upper reach. The lower half of the reach is encroached upon by Mill Road and has limited buffer width.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME08	Segment:	0	Completion Date:	29-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	2,745	Segment Location:	From Route 107 crossing up to the reach break where the impoundment is in more of wetland setting				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor		Left	Right
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant		Residential	Residential
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant		Forest	Forest
Length (ft)	Left	Right	*Human Elevated Incision		NA	Consistency	Non-Cohesive		Non-Cohesive		Mass Failures (ft)		0	0
Berms	0	0	2.9 Sinuosity		Low (<1.2)	Lower					Height (ft)		0	0
height	0	0	2.10 Riffle Type		NA	Material Type	Sand		Sand		Gullies (number)		0	0
Roads	1719	2404	2.11 Riffle Step Spacing		NA	Consistency	Non-Cohesive		Non-Cohesive		Height (ft)		0	0
height	8	10	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps		Minimum	
height	0	0	Boulder	0	%	Erosion Height (ft)	0.0		0.0		4.2 Adjacent Wetlands		Minimum	
Improved Paths	0	0	Cobble	0	%	Revetment Type	Rip-rap		Rip-rap		4.3 Flow Status		Low	
height	0	0	Coarse Gravel	0	%	Revetment Length (ft)	407		64		4.4 # of Debris Jams		0	
Development	2221	2745	Fine Gravel	0	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type		Hydropower	
1.4 Adjacent Side	Left	Right	Sand	40	%	**L** Trees	75	5	20	75	4.6 Up/Downstream Flow Reg		Downstream	
Hillside Slope	Hilly	Steep	Silt & Smaller	60	%	**R** Trees	70	5	50	45	4.7 Stormwater Inputs			
Continuous	Never	Sometimes	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bnkfl	Never	Always	Embedded (chan)	NA	%	**L** Shrubs/Saplings	55	10	50	40	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrubs/Saplings	50	10	50	40	Overland Flow	0	Other	0
1.5 Valley Features			Detritus	30	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		0	
Ph. 2 Valley Width (ft)		680	# LWD	NE		**L** Herbs	80	20	40	40	Affected Length (ft)			
Width Determination		Measured	2.13 Average Largest Particle			**R** Herbs	80	20	40	40	**Step 5. Channel Bed & Planform Changes**			
Ph. 2 Confinement Type		Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	1-25		1-25			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	0	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	0-25		0-25			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	26-50		26-50			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	2181		2721			0		
2.3 Mean Depth (ft)	NA		Field Measured Slop	NE		Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			**L** Trees	45	5	25	70		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		NA			**R** Trees	45	5	50	45		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	50	10	20	70	5.5 Straightening	None		
			Typical Bank Slope	Moderate	Moderate	**R** Shrubs/Saplings	50	10	20	70	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	80	30	50	20				
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	80	40	40	20	Bridge and Culvert Survey		No	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME08	Segment:	0	Completion Date:	29-Sep-09
Organization:	FEA; BCE	Observers:	EPF, SPP	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	2,745	Segment Location:	From Route 107 crossing up to the reach break where the impoundment is in more of wetland setting				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	NA	None	No
7.2 Channel Aggradation	NA	None	No
7.3 Widening Channel	NA	--	No
7.4 Change in Planform	NA	--	No
Total Score:	NA		
Geomorphic Rating:	NA		
Channel Evolution Model	NA		
Channel Evolution Stage	NA		
Geomorphic Condition	NA		
Stream Sensitivity	NA		

Channel Adjustment Processes Narrative

Reach impounded. No professional judgment could be made because of extent of ponding. No administrative judgment was used to determine RGA or RHA scores. Reference stream typing not possible and therefore no default FEH corridor developed.

Notes:

Reach impounded by dam downstream at Mill Rd. Extensive development along both banks of pond area. Some areas with extensive rip-rap along the left bank. Lack of buffer greater than 25 feet for both banks over the majority of the reach's length.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	30-Mar-10
Stream:	Exeter River	Reach #:	ME09	Segment:	0	Completion Date:	26-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP, SAS	Why Not Assessed:	I	Rain:	
Segment Length (ft):	5,757	Segment Location:	From reach break with ME08, to approximately 800 upstream of the confluence of M08 with T1.01.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	Left	Right
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	630	129
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Ph. 2 Valley Width (ft)		870
Width Determination		Estimated
Ph. 2 Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	NA
2.1a Wetted Width (ft)	NA
2.1b Ratio (wetted/bkfl)	NA
2.2 Max Depth (ft)	NA
2.3 Mean Depth (ft)	NA
2.4 Floodprone Width (ft)	NA
2.5 RAF	NA
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		NA
2.7 Entrenchment Ratio		NA
2.8 Incision Ratio		NA
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type	Not Applicable	
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	0	%
Coarse Gravel	0	%
Fine Gravel	0	%
Sand	40	%
Silt & Smaller	60	%
Silt/Clay Present	Yes	
Embedded (chan)	NA	%
Embedded (marg)	NA	%
Detritus	35	%
# LWD	NE	
2.13 Average Largest Particle		
Bed	NA	inches
Bar	NA	inches
2.13a % Subs. Exp.	0	%
2.14 Stream Type		
Stream Type:	NA	
Bed Material:	NA	
Subclass Slope:	NA	
Bed Form:	NA	
Field Measured Slop	NE	
2.15 Reference Stream Type		
NA		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-Cohesive	Non-Cohesive
Lower		
Material Type	Sand	Sand
Consistency	Non-Cohesive	Non-Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	53	0
Erosion Height (ft)	4.0	0.0
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	40	60
R Trees	65	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	85	0	70	30
R Shrubs/Saplings	90	0	70	30

	% Cover	Invasive	Grasses	Forbs
L Herbs	65	0	30	70
R Herbs	85	0	30	70

Bank Canopy	Left	Right
Canopy %	76-100	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>100	>100
Sub-dominant	0-25	0-25
Length <25 ft	500	113

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	90	0	40	60
R Trees	65	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	70	0	20	80
R Shrubs/Saplings	90	0	70	30

	% Cover	Invasive	Grasses	Forbs
L Herbs	45	0	20	80
R Herbs	85	0	30	70

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Shrub/Sapling
Sub-dominant	Residential	Commercial
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Extensive
4.3 Flow Status	Base
4.4 # of Debris Jams	1
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	0
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	None
Length (ft)	0
5.5 Dredging	None
Bridge and Culvert Survey	No

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Jan-10
Stream:	Exeter River	Reach #:	ME09	Segment:	0	Completion Date:	26-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP, SAS	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	5,757	Segment Location:	From reach break with	ME08, up to about 800 upstream of the confluence of M08 with T1.01.			

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	NA	None	No
7.2 Channel Aggradation	NA	None	No
7.3 Widening Channel	NA	--	No
7.4 Change in Planform	NA	--	No
Total Score:	NA		
Geomorphic Rating:	NA		
Channel Evolution Model	NA		
Channel Evolution Stage	NA		
Geomorphic Condition	NA		
Stream Sensitivity	NA		

Channel Adjustment Processes Narrative

Reach impounded. No professional judgment could be made because of extent of ponding. No administrative judgment was used to determine RGA or RHA scores. Reference stream typing not possible and therefore no default FEH corridor developed.

Notes:

Great wetland habitat on the buffers.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	30-Mar-10
Stream:	Exeter River	Reach #:	ME10	Segment:	0	Completion Date:	26-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP, SAS	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	4,421	Segment Location:	From reach break near tributary T1.01, up to the Route 111A crossing.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest	
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	Commercial	Residential	
Length (ft)	Left	Right	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity	Moderate (1.2-1.5)		Lower					Height (ft)	0	0	
height	0	0	2.10 Riffle Type		NA	Material Type	Sand		Sand		Gullies (number)	0	0	
Roads	490	0	2.11 Riffle Step Spacing		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)	0	0	
height	12	0	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	1431		80		4.1 Springs/ Seeps	Present		
height	0	0	Boulder	0	%	Erosion Height (ft)	3.6		4.0		4.2 Adjacent Wetlands	Present		
Improved Paths	0	0	Cobble	0	%	Revetment Type	Rip-rap		None		4.3 Flow Status	Base		
height	0	0	Coarse Gravel	0	%	Revetment Length (ft)	92		0		4.4 # of Debris Jams	7		
Development	196	1421	Fine Gravel	15	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	50	%	**L** Trees	85	0	50	50	4.6 Up/Downstream Flow Reg	Downstream		
Hillside Slope	Steep	Steep	Silt & Smaller	35	%	**R** Trees	85	0	50	50	4.7 Stormwater Inputs			
Continuous	Sometimes	Sometimes	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	1
W/in 1 bnkfl	Sometimes	Sometimes	Embedded (chan)	NA	%	**L** Shrubs/Saplings	80	0	60	40	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrubs/Saplings	80	0	60	40	Overland Flow	0	Other	0
1.5 Valley Features			Detritus	25	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	1		
Ph 2. Valley Width (ft)		700	# LWD	55		**L** Herbs	80	0	25	75	Affected Length (ft)	575		
Width Determination		Measured	2.13 Average Largest Particle			**R** Herbs	80	0	25	75	**Step 5. Channel Bed & Planform Changes**			
Ph 2. Confinement Type		Very Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	76-100		76-100			3	2	1
Human Caused Change?		Yes	2.13a % Subs. Exp.	5	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	E		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	Sand		Dominant	>100		>100			4	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	None		Sub-dominant	51-100		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	Dune-Ripple		Length <25 ft	523		181			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:	NE		Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			**L** Trees	75	0	50	50		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		E, Sand, Dune-ripple			**R** Trees	80	0	50	50		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			Stream Ford
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	70	0	40	60	5.5 Straightening	Straightening		
			Typical Bank Slope	Steep	Steep	**R** Shrubs/Saplings	70	0	40	60	Length (ft)	363		
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None		
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	70	0	25	75				
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	70	0	25	75	Bridge and Culvert Survey	No		

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	3-Mar-10
Stream:	Exeter River	Reach #:	ME10	Segment:	0	Completion Date:	26-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP, SAS	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	4,421	Segment Location:	From reach break near tributary T1.01, up to the Route 111A crossing.				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	NA	NA	NA
7.2 Channel Aggradation	NA	NA	NA
7.3 Widening Channel	NA	--	NA
7.4 Change in Planform	NA	--	NA
Total Score:	NA		
Geomorphic Rating:	NA		
Channel Evolution Model	NA		
Channel Evolution Stage	NA		
Geomorphic Condition	Fair		
Stream Sensitivity	Extreme		

Channel Adjustment Processes Narrative

Professional judgment was used to determine geomorphic condition and stream sensitivity.

Notes:

High quality riparian zone with lots of LWD, debris jams, undercuts. Decreasing erosion and scour heights in a downstream direction because of impoundment . Limited pools, and relatively consistent depth/velocity pattern throughout (slow and deep). Ruins from Hooke Dam were observed at the upper end of the reach. Very minor human caused change in valley confinement at upper end of reach due to Red Brook Road on north bank.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	12-May-10
Stream:	Exeter River	Reach #:	ME11	Segment:	A	Completion Date:	26-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	918	Segment Location:	From reach break at the Route 111A crossing to the segment break approximately 900 feet upstream along Route 111A				

Step 1. Valley and Floodplain

1.1 Segmentation:		CD
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	Left	Right
Berms	0	0
height	0	0
Roads	900	483
height	12	13
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	0	425
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Hilly
Continuous	Sometimes	Never
W/in 1 bnkfl	Always	Sometimes
Texture	Clay	Clay
1.5 Valley Features		
Ph. 2 Valley Width (ft)		600
Width Determination		Measured
Ph. 2 Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		Yes

Step 2. Stream Channel

2.1 Bankfull Width (ft)	54
2.1a Wetted Width (ft)	48.2
2.1b Ratio (wetted/bkfl)	0.89
2.2 Max Depth (ft)	4.1
2.3 Mean Depth (ft)	3.0
2.4 Floodprone Width (ft)	569.4
2.5 RAF	5.5
*Human Elevated FP	7.70

Step 2. (Cont'd)

2.6 Width/Depth Ratio		18.1
2.7 Entrenchment Ratio		10.5
2.8 Incision Ratio		1.3
*Human Elevated Incision		1.9
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		NA
2.11 Riffle Step Spacing		NA
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	22	%
Coarse Gravel	33	%
Fine Gravel	20	%
Sand	24	%
Silt & Smaller	1	%
Silt/Clay Present	Yes	
Embedded (chan)	19	%
Embedded (marg)	25	%
Detritus	15	%
# LWD	8	
2.13 Average Largest Particle		
Bed	320	mm
Bar	NA	mm
2.13a % Subs. Exp.	10	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Gravel	
Subclass Slope:	None	
Bed Form:	Plane Bed	
Field Measured Slope:		
2.15 Reference Stream Type		
C, Gravel, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	0	63
Erosion Height (ft)	0.0	3.0
Revetment Type	Rip-rap	Rip-rap
Revetment Length (ft)	327	258

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	70	0	70	30
R Trees	70	0	80	20

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	40	60
R Shrubs/Saplings	25	0	40	60

	% Cover	Invasive	Grasses	Forbs
L Herbs	25	0	40	60
R Herbs	25	0	60	40

Bank Canopy	Left	Right
Canopy %	51-75	51-75
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	0-25	>100
Sub-dominant	26-50	51-100
Length <25 ft	520	284

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	75	0	80	20
R Trees	65	0	80	20

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	25	0	10	90
R Shrubs/Saplings	15	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs	40	0	40	60
R Herbs	35	0	60	40

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Bare	Forest
Sub-dominant	Forest	Residential
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Minimum
4.2 Adjacent Wetlands	None
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	1
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	NA

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	1	1	2
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
0	0	No

5.4 Stream Ford or Animal Crossing:	None
5.5 Straightening	Straightening
Length (ft)	767
5.5 Dredging	None
Bridge and Culvert Survey	Yes

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	12-May-10
Stream:	Exeter River	Reach #:	ME11	Segment:	A	Completion Date:	26-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP, SAS	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	918	Segment Location:	From reach break at the Route 111A crossing to the segment break approximately 900 feet upstream along Route 111A				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	75	Yes	Yes	No	No
	Problems: DB, A				

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	10	None	Yes
7.2 Channel Aggradation	15	None	No
7.3 Widening Channel	14	--	No
7.4 Change in Planform	12	--	No
Total Score:	51		
Geomorphic Rating:	0.64		
Channel Evolution Model	F		
Channel Evolution Stage	II		
Geomorphic Condition	Fair		
Stream Sensitivity	Very High		

Channel Adjustment Processes Narrative

Floodplain in the east (left) corridor has been severely impacted by Route 111A encroachments. The Incision ratio is 1.34. Channel planform is locked in place by riprap upstream of Danville Road Bridge. Cross section width to depth ratio is only 18; however, major widening noted on bend at upper end of segment.

Notes:

Upstream end of segment at point of historic dam feature has led to a scour pool downstream with some widening. Rip-rap on the east bank along the road in the upper and lower segment. Lower end is partially impounded by the breached dam with beaver activity in downstream segment ME10. Picnic tables from the campground were observed 1,000 ft downstream in ME10. Evidence of recent flooding in campground at time of 5/10/10 site visit.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	30-Mar-10
Stream:	Exeter River	Reach #:	ME11	Segment:	B	Completion Date:	26-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP, SAS	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	3,913	Segment Location:	From the segment break at the breached mill dam, to the reach break at the B & M Railroad trestle crossing.				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right
1.1 Segmentation:		CD	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		*Corridor Land Use*		
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Shrub/Sapling
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	Shrub/Sapling	Forest
Length (ft)	Left	Right	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0
Berms	0	0	2.9 Sinuosity		High (>1.5)	Lower					Height (ft)	0	0
height	0	0	2.10 Riffle Type		NA	Material Type	Silt		Silt		Gullies (number)	0	0
Roads	0	0	2.11 Riffle Step Spacing		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)	0	0
height	0	0	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**		
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	0		63		4.1 Springs/ Seeps	Extensive	
height	0	0	Boulder	0	%	Erosion Height (ft)	0.0		3.0		4.2 Adjacent Wetlands	Extensive	
Improved Paths	0	0	Cobble	0	%	Revetment Type	None		None		4.3 Flow Status	Base	
height	0	0	Coarse Gravel	0	%	Revetment Length (ft)	0		0		4.4 # of Debris Jams	1	
Development	132	0	Fine Gravel	5	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None	
1.4 Adjacent Side	Left	Right	Sand	50	%	**L** Trees	40	0	40	60	4.6 Up/Downstream Flow Reg	None	
Hillside Slope	Hilly	Flat	Silt & Smaller	45	%	**R** Trees	20	0	30	70	4.7 Stormwater Inputs		
Continuous	Sometimes	Sometimes	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch 0
W/in 1 bnkfl	Sometimes	Sometimes	Embedded (chan)	NA	%	**L** Shrubs/Saplings	80	0	80	20	Urban Storm Pipe	0	Tile Drain 0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrubs/Saplings	80	0	80	20	Overland Flow	0	Other 0
1.5 Valley Features			Detritus	40	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	5	
Valley Width (ft)		1175	# LWD	NA		**L** Herbs	75	0	40	60	Affected Length (ft)	1455	
Width Determination		Measured	2.13 Average Largest Particle			**R** Herbs	75	0	40	60	**Step 5. Channel Bed & Planform Changes**		
Confinement Type		Very Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	26-50		1-25			0	0 0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0 0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>100		>100			4	2 0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	None		None			Braiding	
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	0		73			0	
2.3 Mean Depth (ft)	NA		Field Measured Slope:	NE		Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts		
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			**L** Trees	75	0	30	70		# SRs	# HCs Trib Rejuv.
2.5 RAF	NA		Wetland			**R** Trees	40	0	30	70		0	0 No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:		None
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	70	0	60	40	5.5 Straightening	None	
			Typical Bank Slope	Undercut	Undercut	**R** Shrubs/Saplings	80	0	80	20	Length (ft)		
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None	
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	70	0	30	70			
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	75	0	40	60	Bridge and Culvert Survey	No	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Jan-10
Stream:	Exeter River	Reach #:	ME11	Segment:	B	Completion Date:	26-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP, SAS	Why Not Assessed:	W	Rain:	No
Segment Length (ft):	3,913	Segment Location:	From the segment break at the breached mill dam, to the reach break at the B & M Railroad trestle crossing.				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	78	Yes	Yes	No	Yes
	Problems:	None			

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	NA	None	No
7.2 Channel Aggradation	NA	None	No
7.3 Widening Channel	NA	--	No
7.4 Change in Planform	NA	--	No
Total Score:	NA		
Geomorphic Rating:	NA		
Channel Evolution Model	NA		
Channel Evolution Stage	NA		
Geomorphic Condition	NA		
Stream Sensitivity	NA		

Channel Adjustment Processes Narrative

Notes:

Remnants of a mill dam remain at the segment break. This structure is not impounding water, but beaver activity on the structure could lead to future ponding. Entire segment is a palustrine wetland with multiple thread channels.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	30-Mar-10
Stream:	Exeter River	Reach #:	ME12	Segment:	0	Completion Date:	26-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP, SAS	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	3,369	Segment Location:	From the B&M Railroad crossing to the mill dam located downstream of the Scribner Road crossing				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	Left	Right
Berms	0	0
height	0	0
Roads	0	0
height	0	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	553	248
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Hilly
Continuous	Never	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	NE	NE
1.5 Valley Features		
Valley Width (ft)		1140
Width Determination		Measured
Confinement Type		Very Broad
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	77
2.1a Wetted Width (ft)	62
2.1b Ratio (wetted/bkfl)	0.81
2.2 Max Depth (ft)	3.7
2.3 Mean Depth (ft)	2.7
2.4 Floodprone Width (ft)	313
2.5 RAF	4.2
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		28.8
2.7 Entrenchment Ratio		4.1
2.8 Incision Ratio		1.1
*Human Elevated Incision		NA
2.9 Sinuosity	Moderate (1.2-1.5)	
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing		450
2.12 Substrate Composition		
Bedrock	1	%
Boulder	5	%
Cobble	11	%
Coarse Gravel	13	%
Fine Gravel	19	%
Sand	33	%
Silt & Smaller	18	%
Silt/Clay Present	Yes	
Embedded (chan)	26	%
Embedded (marg)	18	%
Detritus	15	%
# LWD	23	
2.13 Average Largest Particle		
Bed	230	mm
Bar	60	mm
2.13a % Subs. Exp.	10	%
2.14 Stream Type		
Stream Type:	C	
Bed Material:	Sand	
Subclass Slope:	None	
Bed Form:	Riffle-Pool	
Field Measured Slop	NE	
2.15 Reference Stream Type		
C, Sand, Riffle-Pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-Cohesive	Non-Cohesive
Lower		
Material Type	Gravel	Gravel
Consistency	Non-Cohesive	Non-Cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	1114	781
Erosion Height (ft)	3.5	3.6
Revetment Type	Hard Bank	Rip-rap
Revetment Length (ft)	230	106

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	85	0	30	70
R Trees	85	0	30	70

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	60	10	40	50
R Shrubs/Saplings	60	10	30	60

	% Cover	Invasive	Grasses	Forbs
L Herbs	50	0	25	75
R Herbs	40	0	25	75

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer

Buffer Width	Left	Right
Dominant	>100	>100
Sub-dominant	0-25	0-25
Length <25 ft	540	458

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	80	0	20	80
R Trees	80	0	40	60

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	65	5	20	75
R Shrubs/Saplings	65	5	20	75

	% Cover	Invasive	Grasses	Forbs
L Herbs	40	0	20	80
R Herbs	30	0	20	80

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	Hay
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Base
4.4 # of Debris Jams	3
4.5 Flow Reg Type	Flood Control
4.6 Up/Downstream Flow Reg	Upstream

4.7 Stormwater Inputs

Field Ditch	0	Road Ditch	1
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	0	Other	0

4.9 # of Beaver Dams	0
Affected Length (ft)	NA

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	3	1	1
	Diagonal	Delta	Island
	3	0	0

5.2 Other Features	Flood	NCO	Avulsion
	1	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts

# SRs	# HCs	Trib Rejuv.
3	0	No

5.4 Stream Ford or Animal Crossing:		Stream Ford
5.5 Straightening	None	
Length (ft)		
5.5 Dredging	None	
Bridge and Culvert Survey	Yes	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	3-Mar-10
Stream:	Exeter River	Reach #:	ME12	Segment:	0	Completion Date:	26-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP, SAS	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	3,369	Segment Location:	From the B&M Railroad crossing to the mill dam located downstream of the Scribner Road crossing				

1.6 Grade Controls **Present**

Type	Location	Total Ht	Ht Above	Photo	GPS Point
Dam	Upstream	7	3.5	Yes	Yes

4.8 Channel Constrictions **Present**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bridge	42	Yes	Yes	Yes	Yes
	Problems:	A			
Dam	8	Yes	Yes	Yes	Yes
	Problems:	DB, SA, A			

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	15	None	No
7.2 Channel Aggradation	10	None	No
7.3 Widening Channel	9		No
7.4 Change in Planform	11		No
Total Score:	45		
Geomorphic Rating:	0.56		
Channel Evolution Model	D		
Channel Evolution Stage	IIc		
Geomorphic Condition	Fair		
Stream Sensitivity	Very High		

Channel Adjustment Processes Narrative

Large flood deposits remain downstream of the Mill Dam at Scribner Road. These deposits have formed several bar features in the upper reach; planform changes and channel aggradation are the dominant adjustments. The aggradtion is responsible for the D evolution model, however, no stream type departure has taken place. The reach still has C-type morphology.

Notes:

This reach is largely controlled by the store and release dam that is located just downstream of Scribner Road. At the time of survey the dam had release port had a 3' height, where a maximum of 12' is possible. Not only is the structure impeding fish passage, it is limiting regularly spaced high flow events and the natural hydrologic regime.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	30-Mar-10
Stream:	Exeter River	Reach #:	ME13	Segment:	0	Completion Date:	25-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	4,728	Segment Location:	Beginning at the Scribner Road crossing the reach extends up to where the channel bends by Route 107				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor		Left	Right
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant		Forest	Forest
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Gravel		Gravel		Sub-dominant		Residential	None
Length (ft)	Left	Right	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)		0	0
Berms	0	0	2.9 Sinuosity		Low (<1.2)	Lower					Height (ft)		0	0
height	0	0	2.10 Riffle Type		NA	Material Type	Sand		Sand		Gullies (number)		0	0
Roads	369	212	2.11 Riffle Step Spacing		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)		0	0
height	15	12	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps		Present	
height	0	0	Boulder	0	%	Erosion Height (ft)	0.0		0.0		4.2 Adjacent Wetlands		Extensive	
Improved Paths	0	0	Cobble	0	%	Revetment Type	Rip-rap		Rip-rap		4.3 Flow Status		Base	
height	0	0	Coarse Gravel	0	%	Revetment Length (ft)	24		0		4.4 # of Debris Jams		0	
Development	463	0	Fine Gravel	0	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type		Flood Control	
1.4 Adjacent Side	Left	Right	Sand	55	%	**L** Trees	30	0	75	25	4.6 Up/Downstream Flow Reg		Downstream	
Hillside Slope	Steep	Steep	Silt & Smaller	45	%	**R** Trees	45	0	55	45	4.7 Stormwater Inputs			
Continuous	Sometimes	Sometimes	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bnkfl	Sometimes	Sometimes	Embedded (chan)	NA	%	**L** Shrubs/Saplings	20	10	35	55	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrubs/Saplings	25	10	35	55	Overland Flow	0	Other	0
1.5 Valley Features			Detritus	30	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		0	
Valley Width (ft)		560	# LWD	NA		**L** Herbs	95	20	40	40	Affected Length (ft)			
Width Determination		Measured	2.13 Average Largest Particle			**R** Herbs	95	15	40	45	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	1-25		26-50			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>100		>100			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	26-50		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	667		601			0		
2.3 Mean Depth (ft)	NA		Field Measured Slop	NE		Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			**L** Trees	70	0	60	40		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		NA			**R** Trees	90	0	50	50		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	50	5	30	65	5.5 Straightening	None		
			Typical Bank Slope	Steep	Steep	**R** Shrubs/Saplings	45	5	30	65	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	80	10	30	60				
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	80	10	30	60	Bridge and Culvert Survey		No	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Jan-10
Stream:	Exeter River	Reach #:	ME13	Segment:	0	Completion Date:	25-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	4,728	Segment Location:	Beginning at the Scribner Road crossing the reach extends up to where the channel bends by Route 107				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	NA	None	No
7.2 Channel Aggradation	NA	None	No
7.3 Widening Channel	NA	--	No
7.4 Change in Planform	NA	--	No
Total Score:	NA		
Geomorphic Rating:	NA		
Channel Evolution Model	NA		
Channel Evolution Stage	NA		
Geomorphic Condition	NA		
Stream Sensitivity	NA		

Channel Adjustment Processes Narrative:

Reach impounded. No professional judgment could be made because of extent of ponding. No administrative judgment was used to determine RGA or RHA scores. Reference stream typing not

Notes:

Reach is impounded by the Cavil Mill Dam downstream of Scribner Road. The structure is 12' high with removable splash boards that can be put in or removed in 1' increments. At the time of the survey the splash boards were set to 3' and the entire area ponded was greatly reduced, compared to 2005 aerial imagery. The owner of the mill structure said that boards are removed in the summer, because of the two very significant floods in the Exeter Basin (2006 & 2007) that caused much flooding in the area and water spilled over Scribner Road.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	12-May-10
Stream:	Exeter River	Reach #:	ME14	Segment:	A	Completion Date:	25-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	775	Segment Location:	Begins at upper end of Mill Pond near Spaulding Road and extends upstream to section that is not impounded by Scribner Rd Dam				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		CD	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest	
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Gravel		Gravel		Sub-dominant	Residential	None	
Length (ft)	Left	Right	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity		Low (<1.2)	Lower					Height (ft)	0	0	
height	0	0	2.10 Riffle Type		NA	Material Type	Sand		Sand		Gullies (number)	0	0	
Roads	0	0	2.11 Riffle Step Spacing		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)	0	0	
height	0	0	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	0		0		4.1 Springs/ Seeps	Present		
height	0	0	Boulder	0	%	Erosion Height (ft)	0.0		0.0		4.2 Adjacent Wetlands	Extensive		
Improved Paths	0	0	Cobble	0	%	Revetment Type	Rip-rap		Rip-rap		4.3 Flow Status	Base		
height	0	0	Coarse Gravel	0	%	Revetment Length (ft)	0		0		4.4 # of Debris Jams	0		
Development	171	0	Fine Gravel	0	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	Flood Control		
1.4 Adjacent Side	Left	Right	Sand	55	%	**L** Trees	30	0	75	25	4.6 Up/Downstream Flow Reg	Downstream		
Hillside Slope	Steep	Steep	Silt & Smaller	45	%	**R** Trees	45	0	55	45	4.7 Stormwater Inputs			
Continuous	Never	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bnkfl	Never	Sometimes	Embedded (chan)	NA	%	**L** Shrubs/Saplings	20	10	35	55	Urban Storm Pipe	0	Tile Drain	0
Texture	NE	NE	Embedded (marg)	NA	%	**R** Shrubs/Saplings	25	10	35	55	Overland Flow	0	Other	0
1.5 Valley Features			Detritus	30	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		0	
Valley Width (ft)		505	# LWD	NA		**L** Herbs	95	20	40	40	Affected Length (ft)			
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs	95	15	40	45	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	1-25		26-50			0	0	0
Human Caused Change?		No	2.13a % Subs. Exp.	NA	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	NA		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	NA		Dominant	>100		>100			0	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	NA		Sub-dominant	26-50		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	NA		Length <25 ft	40		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slop	NE		Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			**L** Trees	70	0	60	40		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		NA			**R** Trees	90	0	50	50		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	50	5	30	65	5.5 Straightening	None		
			Typical Bank Slope	Steep	Steep	**R** Shrubs/Saplings	45	5	30	65	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	80	10	30	60				
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	80	10	30	60	Bridge and Culvert Survey		No	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	12-May-10
Stream:	Exeter River	Reach #:	ME14	Segment:	A	Completion Date:	25-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP	Why Not Assessed:	I	Rain:	No
Segment Length (ft):	775	Segment Location:	Begins at upper end of Mill Pond near Spaulding Road and extends upstream to section that is not impounded by Scribner Rd D				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	NA	None	No
7.2 Channel Aggradation	NA	None	No
7.3 Widening Channel	NA	--	No
7.4 Change in Planform	NA	--	No
Total Score:	NA		
Geomorphic Rating:	NA		
Channel Evolution Model	NA		
Channel Evolution Stage	NA		
Geomorphic Condition	NA		
Stream Sensitivity	NA		

Channel Adjustment Processes Narrative:

Segment impounded. No professional judgment could be made because of extent of ponding. No administrative judgment was used to determine RGA or RHA scores. Reference stream typing not

Notes:

Segment is impounded by the Cavil Mill Dam downstream of Scribner Road. The structure is 12' high with removable splash boards that can be put in or removed in 1' increments. At the time of the survey the splash boards were set to 3' and the entire area ponded was greatly reduced, compared to 2005 aerial imagery. The owner of the mill structure said that boards are removed in the summer, because of the two very significant floods in the Exeter Basin (2006 & 2007) that caused much flooding in the area and water spilled over Scribner Road.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	12-May-10
Stream:	Exeter River	Reach #:	ME14	Segment:	B	Completion Date:	25-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	4,476	Segment Location:	Starts above influence of Scribner Road Dam to the reach break with M15 where the channel parallels Route 107				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right		
1.1 Segmentation:		CD	2.6 Width/Depth Ratio		24.0	*Bank Texture*	Left		Right		Corridor Land Use				
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		1.8	Upper					Dominant	Residential	Forest		
1.3 Corridor Encroachments:			2.8 Incision Ratio		1.0	Material Type	Sand		Sand		Sub-dominant	Forest	Residential		
Length (ft)	Left	Right	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0		
Berms	0	0	2.9 Sinuosity		Low (<1.2)	Lower					Height (ft)	0	0		
height	0	0	2.10 Riffle Type		Complete	Material Type	Gravel		Gravel		Gullies (number)	0	0		
Roads	1534	0	2.11 Riffle Step Spacing (ft)		280	Consistency	Non-cohesive		Non-cohesive		Height (ft)	0	0		
height	16	0	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**				
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	579		245		4.1 Springs/ Seeps	Present			
height	0	0	Boulder	3	%	Erosion Height (ft)	3.3		3.1		4.2 Adjacent Wetlands	Minimum			
Improved Paths	0	0	Cobble	27	%	Revetment Type	Rip-rap		Rip-rap		4.3 Flow Status	Base			
height	0	0	Coarse Gravel	32	%	Revetment Length (ft)	376		367		4.4 # of Debris Jams	0			
Development	1383	1190	Fine Gravel	8	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	Flood Control			
1.4 Adjacent Side	Left	Right	Sand	28	%	**L** Trees	80	0	20	80	4.6 Up/Downstream Flow Reg	Downstream			
Hillside Slope	Very Steep	Steep	Silt & Smaller	2	%	**R** Trees	85	0	25	75	4.7 Stormwater Inputs				
Continuous	Sometimes	Sometimes	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0	
W/in 1 bnkfl	Sometimes	Sometimes	Embedded (chan)	38	%	**L** Shrubs/Saplings	50	10	40	50	Urban Storm Pipe	2	Tile Drain	0	
Texture	NE	NE	Embedded (marg)	42	%	**R** Shrubs/Saplings	60	5	30	65	Overland Flow	0	Other	0	
1.5 Valley Features			Detritus	15	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams	0			
Valley Width (ft)		260	# LWD	11		**L** Herbs	80	0	45	55	Affected Length (ft)				
Width Determination		Estimated	2.13 Average Largest Particle			**R** Herbs	80	0	30	70	**Step 5. Channel Bed & Planform Changes**				
Confinement Type		Narrow	Bed	270	mm	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side	
Rock Gorge?		No	Bar	93	mm	Canopy %	76-100		76-100			4	2	5	
Human Caused Change?		Yes	2.13a % Subs. Exp.	20	%	Mid-channel canopy	Open					Diagonal	Delta	Island	
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						1	1	0	
2.1 Bankfull Width (ft)	67.3		Stream Type:	B		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion	
2.1a Wetted Width (ft)	43.0		Bed Material:	Gravel		Dominant	51-100		>100			2	0	0	
2.1b Ratio (wetted/bkfl)	0.64		Subclass Slope:	c		Sub-dominant	>100		0-25			Braiding			
2.2 Max Depth (ft)	3.9		Bed Form:	Riffle-Pool		Length <25 ft	1265		641			0			
2.3 Mean Depth (ft)	2.8		Field Measured Slope:		NE	*Buffer Veg. Type*	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts				
2.4 Floodprone Width (ft)	121.3		2.15 Reference Stream Type			**L** Trees	90	0	20	80		# SRs	# HCs	Trib Rejuv.	
2.5 RAF	3.9		Bc, Gravel, Riffle-Pool			**R** Trees	90	0	30	70		1	0	Yes	
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None	
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	50	10	10	80	5.5 Straightening	None			
			Typical Bank Slope	Steep	Steep	**R** Shrubs/Saplings	50	10	10	80	Length (ft)				
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging	None			
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	50	0	10	90					
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	50	0	10	90	Bridge and Culvert Survey	Yes			

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	12-May-10
Stream:	Exeter River	Reach #:	ME14	Segment:	B	Completion Date:	25-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP	Why Not Assessed:	NA	Rain:	Yes
Segment Length (ft):	4,476	Segment Location:	Starts above influence of Scribner Road Dam to the reach break with M15 where the channel parallels Route 107				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point
Ledge	Mid-Reach	0.7	At Grade	Yes	No
Ledge	Mid-Reach	2	0.8	Yes	No
Ledge	Mid-Reach	1.1	0.4	Yes	No

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.
Bedrock	57	Yes	No	Yes	Yes
	Problems:	None			
Bridge	43.5	Yes	Yes	Yes	Yes
	Problems:	A			

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	15	None	No
7.2 Channel Aggradation	12	None	No
7.3 Widening Channel	13	--	No
7.4 Change in Planform	14	--	No
Total Score:	54		
Geomorphic Rating:	0.68		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	High		

Channel Adjustment Processes Narrative

Minor aggradation, widening, and planform adjustments. Valley walls were mapped on 5/10/10 and the valley width was updated to 260 feet for Phase 2 and 315 feet for Phase 1. There is a minor human caused change in valley width, but both Phase 1 and 2 channel confinement types are narrow. A second cross section was measured on 5/10/10 that has an entrenchment ratio of 2.2. Based on the both cross sections that were measured, the reference stream type was selected to be a "Bc", and is on the cusp of being a "C" in some locations.

Notes:

Reach had moderately well formed riffle-pool bedform and is set in a narrow valley. Downstream of Sandown Road the channel is very confined, the confinement is potentially more severe because of fill in the village center.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	12-May-10
Stream:	Exeter River	Reach #:	ME15	Segment:	0	Completion Date:	24-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	1,718	Segment Location:	From the reach break up to the change in confinement and southeast of the Linda Lane and Route 107 intersection.				

Step 1. Valley and Floodplain

1.1 Segmentation:		None
1.2 Alluvial Fan:		None
1.3 Corridor Encroachments:		
Length (ft)	Left	Right
Berms	0	0
height	0	0
Roads	62	0
height	20	0
Railroads	0	0
height	0	0
Improved Paths	0	0
height	0	0
Development	149	0
1.4 Adjacent Side	Left	Right
Hillside Slope	Steep	Steep
Continuous	Sometimes	Sometimes
W/in 1 bnkfl	Sometimes	Sometimes
Texture	Mix	Sand
1.5 Valley Features		
Valley Width (ft)		310
Width Determination		Measured
Confinement Type		Narrow
Rock Gorge?		No
Human Caused Change?		No

Step 2. Stream Channel

2.1 Bankfull Width (ft)	65
2.1a Wetted Width (ft)	51.5
2.1b Ratio (wetted/bkfl)	0.79
2.2 Max Depth (ft)	3.7
2.3 Mean Depth (ft)	2.7
2.4 Floodprone Width (ft)	86.2
2.5 RAF	3.7
*Human Elevated FP	NA

Step 2. (Cont'd)

2.6 Width/Depth Ratio		23.8
2.7 Entrenchment Ratio		1.3
2.8 Incision Ratio		1.0
*Human Elevated Incision		NA
2.9 Sinuosity		Low (<1.2)
2.10 Riffle Type		Complete
2.11 Riffle Step Spacing (ft)		233
2.12 Substrate Composition		
Bedrock	0	%
Boulder	0	%
Cobble	6	%
Coarse Gravel	51	%
Fine Gravel	17	%
Sand	20	%
Silt & Smaller	6	%
Silt/Clay Present	Yes	
Embedded (chan)	15	%
Embedded (marg)	40	%
Detritus	20	%
# LWD	4	
2.13 Average Largest Particle		
Bed	130	mm
Bar	NA	inches
2.13a % Subs. Exp.	5	%
2.14 Stream Type		
Stream Type:	B	
Bed Material:	Gravel	
Subclass Slope:	c	
Bed Form:	Riffle-Pool	
Field Measured Slope:		NE
2.15 Reference Stream Type		
Bc, Gravel, Riffle-pool		

Step 3. Riparian Features

3.1 Stream Banks	Left	Right
Typical Bank Slope	Steep	Steep

Step 3. (Cont'd)

Bank Texture	Left	Right
Upper		
Material Type	Sand	Sand
Consistency	Non-cohesive	Non-cohesive
Lower		
Material Type	Gravel	Sand
Consistency	Non-cohesive	Non-cohesive

Bank Erosion	Left	Right
Erosion Length (ft)	97	245
Erosion Height (ft)	3.0	7.0
Revetment Type	None	None
Revetment Length (ft)	0	0

Near Bank Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	75	0	20	80
R Trees	75	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	10	90
R Shrubs/Saplings	30	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs	75	0	30	70
R Herbs	75	0	10	90

Bank Canopy	Left	Right
Canopy %	76-100	76-100
Mid-channel canopy	Open	

3.2 Riparian Buffer		
Buffer Width	Left	Right
Dominant	>100	>100
Sub-dominant	26-50	None
Length <25 ft	0	0

Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous
L Trees	75	0	20	80
R Trees	85	0	50	50

	% Cover	Invasive	WADs	Saplings
L Shrubs/Saplings	30	0	10	90
R Shrubs/Saplings	30	0	10	90

	% Cover	Invasive	Grasses	Forbs
L Herbs	60	0	40	60
R Herbs	55	0	10	90

3.3 Riparian Corridor	Left	Right
Corridor Land Use		
Dominant	Forest	Forest
Sub-dominant	Residential	None
Mass Failures (ft)	0	0
Height (ft)	0	0
Gullies (number)	0	0
Height (ft)	0	0

Step 4. Flow & Flow Modifiers

4.1 Springs/ Seeps	Present
4.2 Adjacent Wetlands	Present
4.3 Flow Status	Base
4.4 # of Debris Jams	0
4.5 Flow Reg Type	None
4.6 Up/Downstream Flow Reg	None

4.7 Stormwater Inputs			
Field Ditch	0	Road Ditch	0
Urban Storm Pipe	0	Tile Drain	0
Overland Flow	2	Other	0

4.9 # of Beaver Dams	1
Affected Length (ft)	210

Step 5. Channel Bed & Planform Changes

5.1 Bar Types	Mid	Point	Side
	0	0	1
	Diagonal	Delta	Island
	0	0	0

5.2 Other Features	Flood	NCO	Avulsion
	0	0	0
	Braiding		
	0		

5.3 Steep Riffles & Headcuts			
	# SRs	# HCs	Trib Rejuv.
	0	0	No

5.4 Stream Ford or Animal Crossing:		None
5.5 Straightening	None	
Length (ft)		
5.5 Dredging	None	
Bridge and Culvert Survey	No	

Note: Step 1.6 Grade Controls and Step 4.8 Channel Constrictions on Sheet 2 of this workbook.

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Mar-10
Stream:	Exeter River	Reach #:	ME15	Segment:	0	Completion Date:	24-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	1,718	Segment Location:	From the reach break up to the change in confinement and southeast of the Linda Lane and Route 107 intersection.				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	17	None	No
7.2 Channel Aggradation	17	None	No
7.3 Widening Channel	16	--	No
7.4 Change in Planform	17	--	No
Total Score:	67		
Geomorphic Rating:	0.84		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	High		

Channel Adjustment Processes Narrative

On the cusp of being reference condition, no significant adjustments noted.

Notes:

Naturally limited habitat, reach appears to be stable.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment

Phase 2 Segment Summary (page 1)

Project:	Middle Exeter					Sheet Last Revised:	30-Mar-10
Stream:	Exeter River	Reach #:	ME16	Segment:	0	Completion Date:	24-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	5,273	Segment Location:	From reach break up to the start of the Upper Exeter reaches due south of the Regina Ave., Mary Ave. intersection				

Step 1. Valley and Floodplain			*Step 2. (Cont'd)*			*Step 3. (Cont'd)*					3.3 Riparian Corridor	Left	Right	
1.1 Segmentation:		None	2.6 Width/Depth Ratio		NA	*Bank Texture*	Left		Right		*Corridor Land Use*			
1.2 Alluvial Fan:		None	2.7 Entrenchment Ratio		NA	Upper					Dominant	Forest	Forest	
1.3 Corridor Encroachments:			2.8 Incision Ratio		NA	Material Type	Sand		Sand		Sub-dominant	Residential	Shrub/Sapling	
Length (ft)	Left	Right	*Human Elevated Incision		NA	Consistency	Non-cohesive		Non-cohesive		Mass Failures (ft)	0	0	
Berms	0	0	2.9 Sinuosity	Moderate (1.2-1.5)		Lower					Height (ft)	0	0	
height	0	0	2.10 Riffle Type		NA	Material Type	Sand		Sand		Gullies (number)	0	0	
Roads	362	0	2.11 Riffle Step Spacing		NA	Consistency	Non-cohesive		Non-cohesive		Height (ft)	0	0	
height	20	0	2.12 Substrate Composition			*Bank Erosion*	Left		Right		**Step 4. Flow & Flow Modifiers**			
Railroads	0	0	Bedrock	0	%	Erosion Length (ft)	1058		385		4.1 Springs/ Seeps	Present		
height	0	0	Boulder	0	%	Erosion Height (ft)	3.5		2.6		4.2 Adjacent Wetlands	Extensive		
Improved Paths	0	0	Cobble	0	%	Revetment Type	None		None		4.3 Flow Status	Base		
height	0	0	Coarse Gravel	0	%	Revetment Length (ft)	0		0		4.4 # of Debris Jams	6		
Development	1670	0	Fine Gravel	5	%	*Near Bank Veg. Type*	% Cover	Invasive	Conifer	Deciduous	4.5 Flow Reg Type	None		
1.4 Adjacent Side	Left	Right	Sand	55	%	**L** Trees	50	0	5	95	4.6 Up/Downstream Flow Reg	None		
Hillside Slope	Flat	Hilly	Silt & Smaller	40	%	**R** Trees	55	0	5	95	4.7 Stormwater Inputs			
Continuous	Never	Never	Silt/Clay Present	Yes			% Cover	Invasive	WADs	Saplings	Field Ditch	0	Road Ditch	0
W/in 1 bnkfl	Sometimes	Never	Embedded (chan)	NA	%	**L** Shrubs/Saplings	70	10	30	60	Urban Storm Pipe	0	Tile Drain	0
Texture	Sand	Sand	Embedded (marg)	NA	%	**R** Shrubs/Saplings	75	10	30	60	Overland Flow	0	Other	0
1.5 Valley Features			Detritus	35	%		% Cover	Invasive	Grasses	Forbs	4.9 # of Beaver Dams		1	
Valley Width (ft)		740	# LWD	41		**L** Herbs	80	0	35	65	Affected Length (ft)		750	
Width Determination		Measured	2.13 Average Largest Particle			**R** Herbs	85	0	25	75	**Step 5. Channel Bed & Planform Changes**			
Confinement Type		Very Broad	Bed	NA	inches	*Bank Canopy*	Left		Right		5.1 Bar Types	Mid	Point	Side
Rock Gorge?		No	Bar	NA	inches	Canopy %	26-50		51-75			1	0	1
Human Caused Change?		No	2.13a % Subs. Exp.	0	%	Mid-channel canopy	Open					Diagonal	Delta	Island
Step 2. Stream Channel			2.14 Stream Type			3.2 Riparian Buffer						0	0	0
2.1 Bankfull Width (ft)	NA		Stream Type:	E		Buffer Width	Left		Right		5.2 Other Features	Flood	NCO	Avulsion
2.1a Wetted Width (ft)	NA		Bed Material:	Sand		Dominant	>100		>100			2	0	0
2.1b Ratio (wetted/bkfl)	NA		Subclass Slope:	None		Sub-dominant	26-50		None			Braiding		
2.2 Max Depth (ft)	NA		Bed Form:	Dune-Ripple		Length <25 ft	301		0			0		
2.3 Mean Depth (ft)	NA		Field Measured Slope:	NE		Buffer Veg. Type	% Cover	Invasive	Conifer	Deciduous	5.3 Steep Riffles & Headcuts			
2.4 Floodprone Width (ft)	NA		2.15 Reference Stream Type			**L** Trees	50	0	10	90		# SRs	# HCs	Trib Rejuv.
2.5 RAF	NA		Wetland			**R** Trees	60	0	15	85		0	0	No
*Human Elevated FP	NA		**Step 3. Riparian Features**				% Cover	Invasive	WADs	Saplings	5.4 Stream Ford or Animal Crossing:			None
			3.1 Stream Banks	Left	Right	**L** Shrubs/Saplings	70	5	35	60	5.5 Straightening	None		
			Typical Bank Slope	Steep	Steep	**R** Shrubs/Saplings	75	5	35	60	Length (ft)			
							% Cover	Invasive	Grasses	Forbs	5.5 Dredging		None	
Note: Step 1.6 Grade Controls and Step 4.8						**L** Herbs	70	0	30	70				
Channel Constrictions on Sheet 2 of this workbook.						**R** Herbs	75	0	25	75	Bridge and Culvert Survey		No	

Legend: RAF=Recently Abandoned Floodplain, FP=Floodplain, LWD=Large Woody Debris, % Subs. Exp.=Exposed Substrate, Flood=Flood Chute, NCO=Neck Cutoff, SR=Steep Riffle, HC=Head Cut
NE= Not evaluated, NA=Not applicable

Phase 2 Segment Summary (page 2)

Project:	Middle Exeter					Sheet Last Revised:	29-Jan-10
Stream:	Exeter River	Reach #:	ME16	Segment:	0	Completion Date:	24-Sep-09
Organization:	BCE; FEA	Observers:	MMN, SPP	Why Not Assessed:	NA	Rain:	No
Segment Length (ft):	5,273	Segment Location:	From reach break up to the start of the Upper Exeter reaches due south of the Regina Ave., Mary Ave. intersection				

1.6 Grade Controls **None**

Type	Location	Total Ht	Ht Above	Photo	GPS Point

4.8 Channel Constrictions **None**

Type	Width (ft)	Photo	GPS	Channel Constr.	Floodprone Constr.

Step 7. Rapid Geomorphic Assessment Summary (*fill out RGA sheet first, then enter narrative*)

Confinement Type Unconfined

	Score	STD	Historic
7.1 Channel Degradation	NA	None	No
7.2 Channel Aggradation	NA	None	No
7.3 Widening Channel	NA	--	No
7.4 Change in Planform	NA	--	No
Total Score:	NA		
Geomorphic Rating:	NA		
Channel Evolution Model	F		
Channel Evolution Stage	I		
Geomorphic Condition	Good		
Stream Sensitivity	High		

Channel Adjustment Processes Narrative

Professional judgment was used to determine stream type, geomorphic condition rating, and stream sensitivity.

Notes:

Lots of bank erosion related to the sandy soils. Most of reach impounded wetland with diffuse flows. Administrative judgment used and scores of 'good' for RHA and RGA were assigned. Lots of LWD, and several refuge areas, but the channel lacks a diverse array of velocity and depth patterns; limited undercut banks.

Legend: Ht.=Height, Constr.=Constriction, Old abutm.=Old abutment, DA=Deposition above, DB=Deposition below, SA=Scour above, SB=Scour below, A=Alignment