



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-0334

MEMORANDUM

To: Lia Obaid
Design Division

From: Matt Richards
Environmental Division

Date: March 28, 2012

Subject: ENVIRONMENTAL BOUNDARIES AND MITIGATION DESIGN FOR:
Fayette County, Interstate 40 Interchange at State Route 222
P.E. 24001-0147-44 PIN 114219.00

An ecological evaluation of the subject project has been conducted with the following results:

Wetlands present: **Three wetland areas are present within the project limits. Refer to attachments for locations and potential mitigation.**

No wetlands identified

Streams are present: **One stream is present within the project limits. Refer to attachments for locations and potential mitigation.**

No streams present in project impact area

Protected species present:

No protected species identified in project impact area

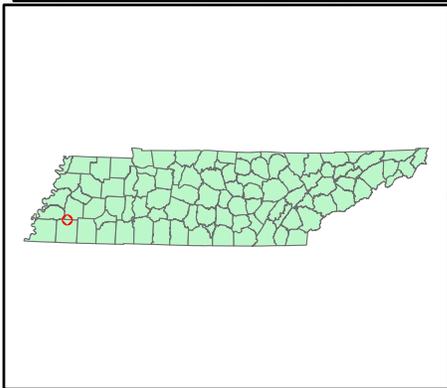
Special haul road provisions needed:

THE FOLLOWING ITEMS ARE ATTACHED FOR YOUR USE:

X	Environmental Boundaries
	Mitigation Design Sketches
	Narrative Mitigation Plan
	Other : <i>Marked present layout sheet</i>

Your assistance is appreciated. If you have any questions or comments, please contact Matt Richards in the Environmental Division at 615-532-3880 or b.m.richards@tn.gov.

xc: Jennifer Lloyd w/ attachments
Shane Hester w/ attachments
Freddy Miller w/ attachments
John Hewitt w/ attachments
Joe Matlock w/ attachments
Michael Horlacher w/ attachments
Construction Rep. w/ attachments
Jon Zirkle w/ attachments
Project File
Reading File



Fayette County I-40 Interchange at SR-222

P.E. 24001-0147-44
PIN 114219.00



Project: Fayette County, I-40 at SR-222

P.E. 24001-0147-44 PIN 114219.00

Date of survey: 3/22/2012**Biologist:** Matt Richards**Affiliation:** TDOT

1-Station: from plans	None provided
2-Map label and name	STR-1
3-Latitude/Longitude	89 24'41.27"W 35 23'40.18"N
4-Potential impact	Crossing
5-Feature description:	
what is it	Intermittent stream
blue-line on topo? (y/n)	No
defined channel (y/n)	Yes
straight or meandering	Straight
channel bottom width	1'
top of bank width	6'
bank height and slope ratio	3'
avg. gradient of stream (%)	
substratum	Soil, leaves
riffle/run/pool	20/0/80
width of buffer zone	LB: 7' RB: 7'
water flow	Slight
water depth	2"-1'
water width	1'
general water quality	Clear, flowing
OHWI indicators	Bed and bank, vegetation absent, deposition
groundwater connection	Yes
bank stability: LB, RB	Eroding
dominant species: LB, RB	Black willow, box elder, honeysuckle
overhead canopy (%)	85%
benthos	No
fish	No
algae or other aquatic life	Algae
habitat assessment score	
photo number (s)	1 Looking D/S from farm road crossing; 2 looking U/S from farm road crossing
rainfall information	4.69" in previous two weeks
6- HUC code & name (12-digit)	080102080402, Big Muddy Creek, Lower
7-Confirmed by:	Unnecessary
8-Mitigation	No_____ Yes_____ : (include on Form J)
9-ETW	No <input checked="" type="checkbox"/> Yes_____
10-303 (d) List	No <input checked="" type="checkbox"/> Yes_____: Habitat_____ Siltation_____
11-Notes Estimate size (acres) of lake or pond if applicable; provide any pertinent information needed to better describe feature; indicate if hydrologic determination form completed	Hydrology supplied by SPG-1.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-40 at SR-222, PIN 114219.00 City/County: Fayette Sampling Date: 3/22/2012
 Applicant/Owner: TDOT State: TN Sampling Point: WTL-1
 Investigator(s): Matt Richards Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Convex Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) ___ Marl Deposits (B15) (LRR U) <input checked="" type="checkbox"/> Water Marks (B1) ___ Hydrogen Sulfide Odor (C1) ___ Sediment Deposits (B2) ___ Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Drift Deposits (B3) ___ Presence of Reduced Iron (C4) ___ Algal Mat or Crust (B4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Iron Deposits (B5) ___ Thin Muck Surface (C7) ___ Inundation Visible on Aerial Imagery (B7) ___ Other (Explain in Remarks)	___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) <input checked="" type="checkbox"/> Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1-6</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 SPG-1 to west is hydrology source for WTL-1 and STR-1

VEGETATION – Use scientific names of plants.

Sampling Point: WTL-1

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot sizes: _____)				
1. <u>black willow</u>	<u>60</u>	<u>yes</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
_____ = Total Cover				
Sapling Stratum (_____)				
1. <u>boxelder</u>	<u>10</u>	<u>yes</u>	<u>FACW</u>	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
_____ = Total Cover				
Shrub Stratum (_____)				
1. _____				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
_____ = Total Cover				
Herb Stratum (_____)				
1. _____				Definitions of Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
_____ = Total Cover				
Woody Vine Stratum (_____)				
1. <u>honeysuckle</u>	<u>5</u>	<u>yes</u>		
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WTL-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
10	10YR 6/1	90	7.5YR 5/6	5				

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12) (LRR T, U)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-40 at SR-222 PIN 114219.00 City/County: Fayette Sampling Date: 3/22/2012
 Applicant/Owner: TDOT State: TN Sampling Point: WTL-2
 Investigator(s): Matt Richards Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Convex Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No _____
Remarks: Photo 5 looking east	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input checked="" type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2-4</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Water held between I-40 ramp and berm to north.

VEGETATION – Use scientific names of plants.

Sampling Point: WTL-2

	Absolute % Cover	Dominant Species?	Indicator Status			
Tree Stratum (Plot sizes: _____)						
1. <u>Black willow</u>	<u>70</u>		<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)		
2. _____						
3. _____						
4. _____						
5. _____						
6. _____						
7. _____						
		= Total Cover			Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling Stratum (_____)						
1. _____						
2. _____						
3. _____						
4. _____						
5. _____						
6. _____						
		= Total Cover		Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)		
Shrub Stratum (_____)						
1. _____						
2. _____						
3. _____						
4. _____						
5. _____						
6. _____						
		= Total Cover		¹ Indicators of hydric soil and wetland hydrology must be present.		
Herb Stratum (_____)						
1. _____						
2. _____						
3. _____						
4. _____						
5. _____						
6. _____						
		= Total Cover		Definitions of Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height.		
Woody Vine Stratum (_____)						
1. _____						
2. _____						
3. _____						
4. _____						
5. _____						
		= Total Cover			Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: (If observed, list morphological adaptations below).						

SOIL

Sampling Point: WTL-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
10	10YR 6/1	80	10YR 4/6	8				

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12) (LRR T, U)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-40 at SR-222 PIN 114219.00 City/County: Fayette Sampling Date: 3/22/2012
 Applicant/Owner: TDOT State: TN Sampling Point: WTL-3
 Investigator(s): Matt Richards Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Convex Slope (%): _____
 Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Photo 6 looking west	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input checked="" type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1-6</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Water held between I-40 ramp and field road to the north.

VEGETATION – Use scientific names of plants.

Sampling Point: WTL-3

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot sizes: _____)					
1. <u>Boxelder</u>	<u>35</u>	<u>yes</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
_____ = Total Cover					Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling Stratum (_____)					
1. <u>Sweetgum</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>		
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Shrub Stratum (_____)					
1. <u>Juncus effusus</u>	<u>5</u>	<u>yes</u>	<u>OBL</u>		¹ Indicators of hydric soil and wetland hydrology must be present.
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
_____ = Total Cover				Definitions of Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height.	
Herb Stratum (_____)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
12. _____					
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
Woody Vine Stratum (_____)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
_____ = Total Cover					
Remarks: (If observed, list morphological adaptations below).					

SOIL

Sampling Point: WTL-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
10	10YR 6/2	70	10YR 3/6	20				

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) (LRR P, T, U)
- 5 cm Mucky Mineral (A7) (LRR P, T, U)
- Muck Presence (A8) (LRR U)
- 1 cm Muck (A9) (LRR P, T)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) (MLRA 150A)
- Sandy Mucky Mineral (S1) (LRR O, S)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR P, S, T, U)

- Polyvalue Below Surface (S8) (LRR S, T, U)
- Thin Dark Surface (S9) (LRR S, T, U)
- Loamy Mucky Mineral (F1) (LRR O)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) (LRR U)
- Depleted Ochric (F11) (MLRA 151)
- Iron-Manganese Masses (F12) (LRR O, P, T)
- Umbric Surface (F13) (LRR P, T, U)
- Delta Ochric (F17) (MLRA 151)
- Reduced Vertic (F18) (MLRA 150A, 150B)
- Piedmont Floodplain Soils (F19) (MLRA 149A)
- Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) (LRR O)
- 2 cm Muck (A10) (LRR S)
- Reduced Vertic (F18) (outside MLRA 150A,B)
- Piedmont Floodplain Soils (F19) (LRR P, S, T)
- Anomalous Bright Loamy Soils (F20) (MLRA 153B)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12) (LRR T, U)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Natural Resources Mitigation Sketches/Information

Project: P.E. PIN

Date of survey:

Biologist:

Affiliation:

Station	Map label	Attachments: Marked-up plans sheet (A); notes (B); mitigation plan (C) attached	Calculate permanent & temporary wetland impacts & provide to (name of regional biologist) and John Hewitt ("X")	Apply "standard" stream relocation configuration & instructions ("X")	Survey boundaries as flagged in field ("X")	General notes and/or specific changes requested
None Provided	STR-1	A, B, C		X		Unknown if STR-1 will require relocation or culvert extension. In-lieu fee payment required if culvert exceeds 200'. Standard stream relocation (attached) applies if a required relocation exceeds 50' in length.
None Provided	WTL-1	A, B, C	X		X	Unknown if WTL-1 will be impacted. If permanent project wetland impacts exceed 0.10 acres, mitigation will be required at 2:1 ratio in the Hatchie Mitigation Bank. Temporary wetland impact instructions are attached if necessary.
None Provided	SPG-1	A				Unknown if SPG-1 will be impacted. A spring box will be required to maintain flow to STR-1 if fill will cover SPG-1.
None Provided	WTL-2	A B, C	X		X	Unknown if WTL-1 will be impacted. If permanent project wetland impacts exceed 0.10 acres, mitigation will be required at 2:1 ratio in the Hatchie Mitigation Bank. Temporary wetland impact instructions are attached if necessary.
None Provided	WTL-3	A, B, C	X		X	Unknown if WTL-1 will be impacted. If permanent project wetland impacts exceed 0.10 acres, mitigation will be required at 2:1 ratio in the Hatchie Mitigation Bank. Temporary wetland impact instructions are attached if necessary.

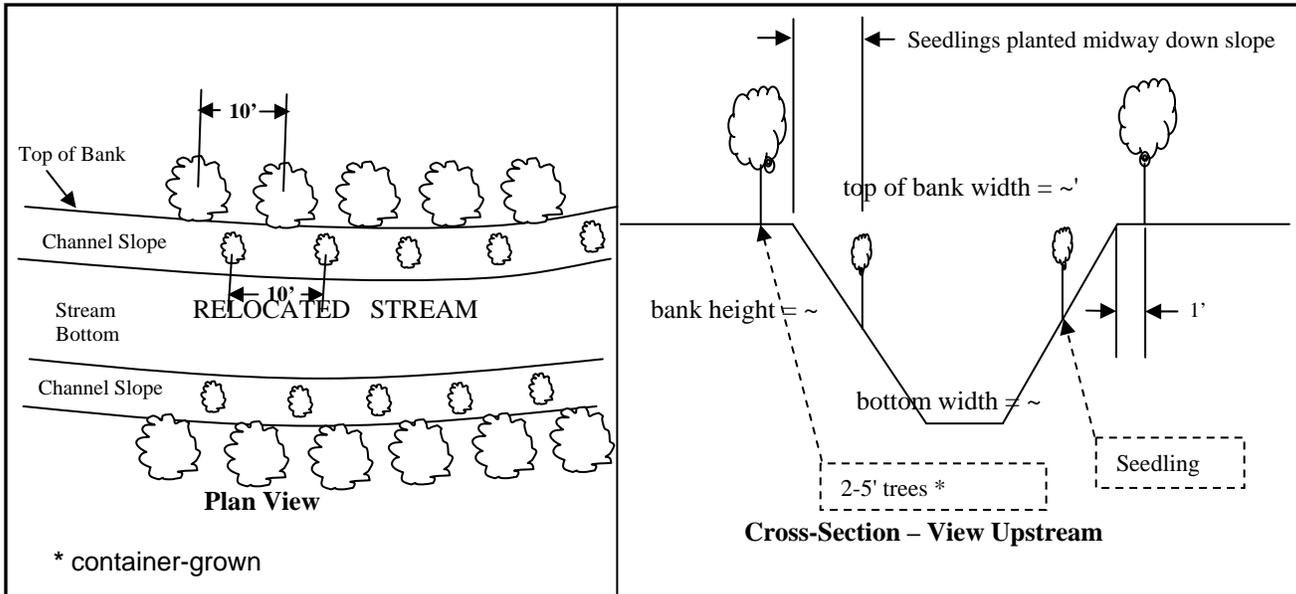
Standard Stream Mitigation (if required)

Apply these measures to all applicable streams listed in Form J. Duplicate the length, bottom channel width, elevations, side slopes, meander wavelength, and curvature of the existing channels to the extent possible. Each channel should transition smoothly from its beginning elevation to its tie-in elevation in the receiving stream, without profile drops or jumps. Locate the new channels in as flat an area as possible to avoid unusually high side slopes; this may require some additional right-of-way. Channel length placed in spring-boxes or culverts counts as part of the new channel length (but may require off-site compensatory mitigation that would not be required for an open channel). Channel side slopes should mimic existing channel side slopes, unless otherwise indicated, and be stabilized using appropriate BMPs – the use of rip-rap should be avoided if possible. If rip-rap is required, the rip-rap should be embedded into the soil such that (1) the top of the rip-rap is flush with the bottom and sides of the channel, (2) the voids are filled with material similar to the original channel bottom, and (3) water will flow on top of the embedded riprap and soil material to enable the water to be visible.

Plant two alternating rows of tree or shrub species on both sides of the new channels; the first row shall be bare root seedlings that are planted on the channel slope, centered on the midpoint of the slope. Along top of bank, two- to five-foot (2-5 ft) container grown trees are to be planted within one foot of the top of bank. If needed, black willow (*Salix nigra*) stakes will be installed along the edge of water in the new channel. The stakes will be fresh material cut in approximately foot lengths. The stakes will be installed on approximately five foot centers at the edge of water in the new channel. The stakes are to be driven in such that approximately six inches of the stake are left above ground. The bare root seedlings will be the same species as the trees, unless otherwise indicated.

Rip-rap, if required, should be limited to ends of culverts. All relocated channels and their accompanying mitigation features, including trees, are to be placed in right-of-way rather than easements; this may require acquisition of additional right-of-way. Use the following specifications for planted species.

SPACING FOR PLANTING ALONG RELOCATED STREAM



Tree species for stream:

Item #	Description	Unit
	<i>Acer rubrum</i> (red maple) 2-5' in height, containerized	Each
	<i>Fraxinus pennsylvanica</i> (green ash) 2-5' in height, containerized	Each
	<i>Platanus occidentalis</i> (sycamore) 2-5' in height, containerized	Each
	<i>Salix nigra</i> (black willow) 18"-24" Ht, BR	Each
	<i>Quercus alba</i> (white oak) 2-5' in height, containerized	Each
	<i>Acer negundo</i> (boxelder) 18"-24" Ht, BR	Each

Standard On-site Mitigation for Temporary Wetland Impact Areas (if required)

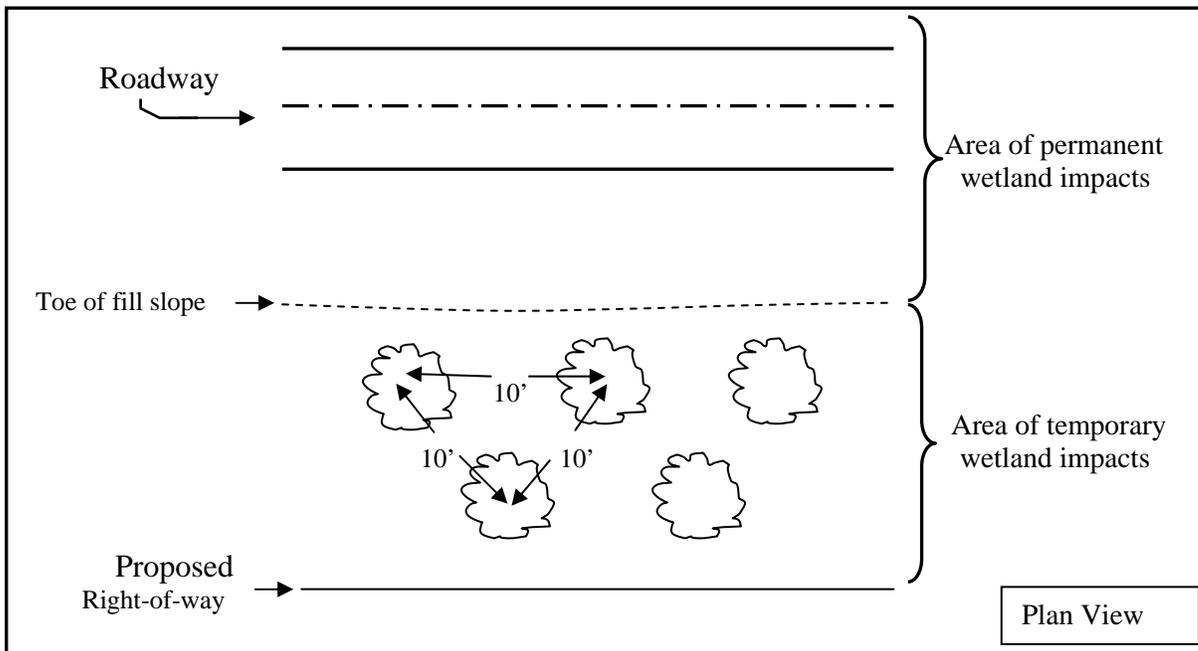
Apply these measures to all applicable temporary wetland impact areas listed in Form J. For temporary wetland impact areas, remove the top 12" of topsoil and stockpile it until construction is complete. Once construction activities are completed, restore all temporary wetland impact areas to pre-construction conditions. This includes removing haul roads (if applicable), restoring the site to the original (pre-construction) elevation and spreading stockpiled topsoil back over the wetland site. The area of temporary impacts will be stabilized according to standard practices. Planting will be based on notes provided by Ecology. Wetland areas located outside of proposed right-of-way and construction easements are to be clearly marked and not disturbed.

Tree species for temporary wetland impacts:

Item #	Description	Unit
	Seedling: <i>Acer rubrum</i> (red maple) 18"-24" Ht, BR	Each
	Seedling: <i>Fraxinus pennsylvanica</i> (green ash) 18"-24" Ht, BR	Each
	Seedling: <i>Platanus occidentalis</i> (sycamore) 18"-24" Ht, BR	Each
	Seedling: <i>Liquidambar styraciflua</i> (sweetgum) 18"-24" Ht, BR	Each
	Seedling: <i>Acer negundo</i> (box elder) 18"-24" Ht, BR	Each

Ht = Height, BR = Bare Root

Tree planting scheme for temporary wetland impact areas



Please place the following notes in the Special Notes section of the plans:

Topsoil is to be removed from all areas of temporary wetland impacts and stockpiled prior to construction.

Upon completion of construction activities, temporary haul roads are to be removed. Excavated material from the haul roads is to be disposed of as directed by the engineer.

Plans Notes**Please add the following information verbatim to the Final Plans:****CHANNEL RELOCATION SEQUENCE AND IMPLEMENTATION NOTES FOR RELOCATED STREAM CHANNELS (IGNORE REFERENCES TO ITEMS NOT SPECIFIED)**

1. If the relocated channel flows into a proposed culvert, the new channel shall be relocated prior to installation of the culvert to ensure correct elevation levels are set for the inlet. The new channel shall be excavated and stabilized during a low-water period. Rip-rap (only as shown on plans), seeding, and/or sod shall be installed immediately following channel completion. Trees shall be installed in the first planting season following channel excavation. Water shall be diverted into the new channel only after it is completely stabilized, and only during a low-water period. Stabilized means that all specified rock, erosion control blankets, seeding, sod, or materials are in place and established.
2. CHANNEL RELOCATION SEQUENCE
 - a. Flag edge of the new channel top bank prior to clearing. Do not clear large trees in position to shade the new channel. Leave as many trees and shrubs as possible between toe of the new highway slope and the stream.
 - b. Excavate the new channel "in the dry" by leaving areas of undisturbed earth (diversion berms) in place at both ends.
 - c. Shape channel to specifications shown. Remove loose soils and debris.
 - d. Place topsoil, erosion control blanket. seed, sod, or other material as specified.
 - e. Remove diversion berms, beginning with the most downstream; banks and bottom elevation of the old channel should transition smoothly into the new channel. The elevations of the new channel bottom at each end of the relocation sequence should match the elevations of the existing channel, and a steady percent slope should be maintained throughout the relocated channel centerline or as specified.
 - f. Install trees according to standard specifications section 802.
3. Only rip-rap shown on plans should be used in the relocated channel reach. Any other proposed rip-rap should be coordinated with the Environmental Division through the TDOT Construction Office.
4. Requests by any agency that would require the modification of channels, ditches, elevations, rip-rap or any other stream mitigation items associated with the channel relocations shall be referred to the TDOT Environmental Division via the Headquarters Construction Office for coordination with all involved agencies and TDOT divisions. Tennessee Department of Environment and Conservation may make recommendations concerning erosion control via the engineer without such referral.

TREES

No substitutions of tree species or sizes shall be allowed without the written approval of TDOT Environmental Division. Trees shall be of the variety requested, between 2 and 5 feet in height, containerized, and first quality. Bare root trees shall be of the variety requested, well branched, and first quality. Bare roots must be kept moist at all times. No clones or cultivars will be accepted. Any found to be incorrect species, or improperly planted, at any time prior to termination of the contract shall be removed and replaced at the contractor's expense. Stakes and wires shall be removed immediately prior to contract termination, unless otherwise directed by Environmental Division.

The contractor should arrange several months ahead of time to obtain the correct tree species, as some may require some time to locate.

All trees planted shall be wrapped as per section 802.07 of TDOT standard specifications for the road and bridge construction.

Trees shall be watered as required through the period of establishment to ensure survival.



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL DIVISION
SUITE 900 - JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-0334**

March 7, 2012

Mary Jennings
U.S. Department of Interior
Fish and Wildlife Service
446 Neal Street
Cookeville, TN 38501

SUBJECT: Fayette County, I-40 Interchange at SR-22
P.E. 24001-1147-44 PIN 114219.00

Dear Ms. Jennings:

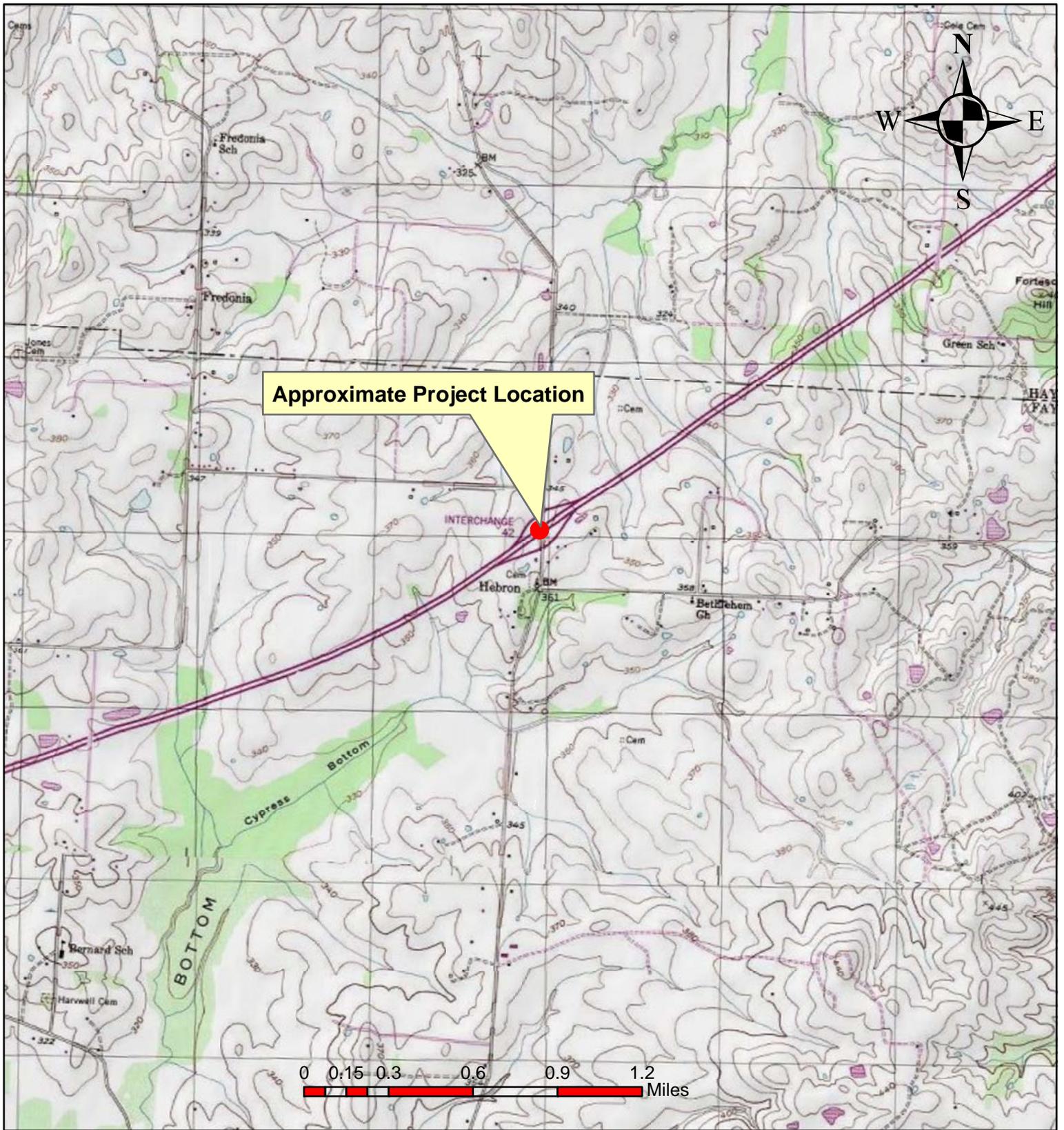
The Tennessee Department of Transportation proposes to construct the subject project. A Project Location Map is attached. In compliance with the Fish and Wildlife Act of 1958, and the Endangered Species Act of 1973 (as amended), we are requesting a list of threatened or endangered species that may be present in the vicinity of the proposed construction.

Please include in your reply the entire project description as listed in the subject line of this request. Your assistance in the preparation of this project is greatly appreciated. If you need additional information, please contact me at 615-532-3880.

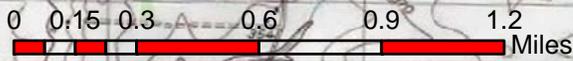
Sincerely,

Matt Richards
TDOT Biologist

xc: Reading File
Project File



Approximate Project Location



Fayette County, I-40 Interchange at SR-22

**P.E. 24001-1147-44
PIN 114219.00**



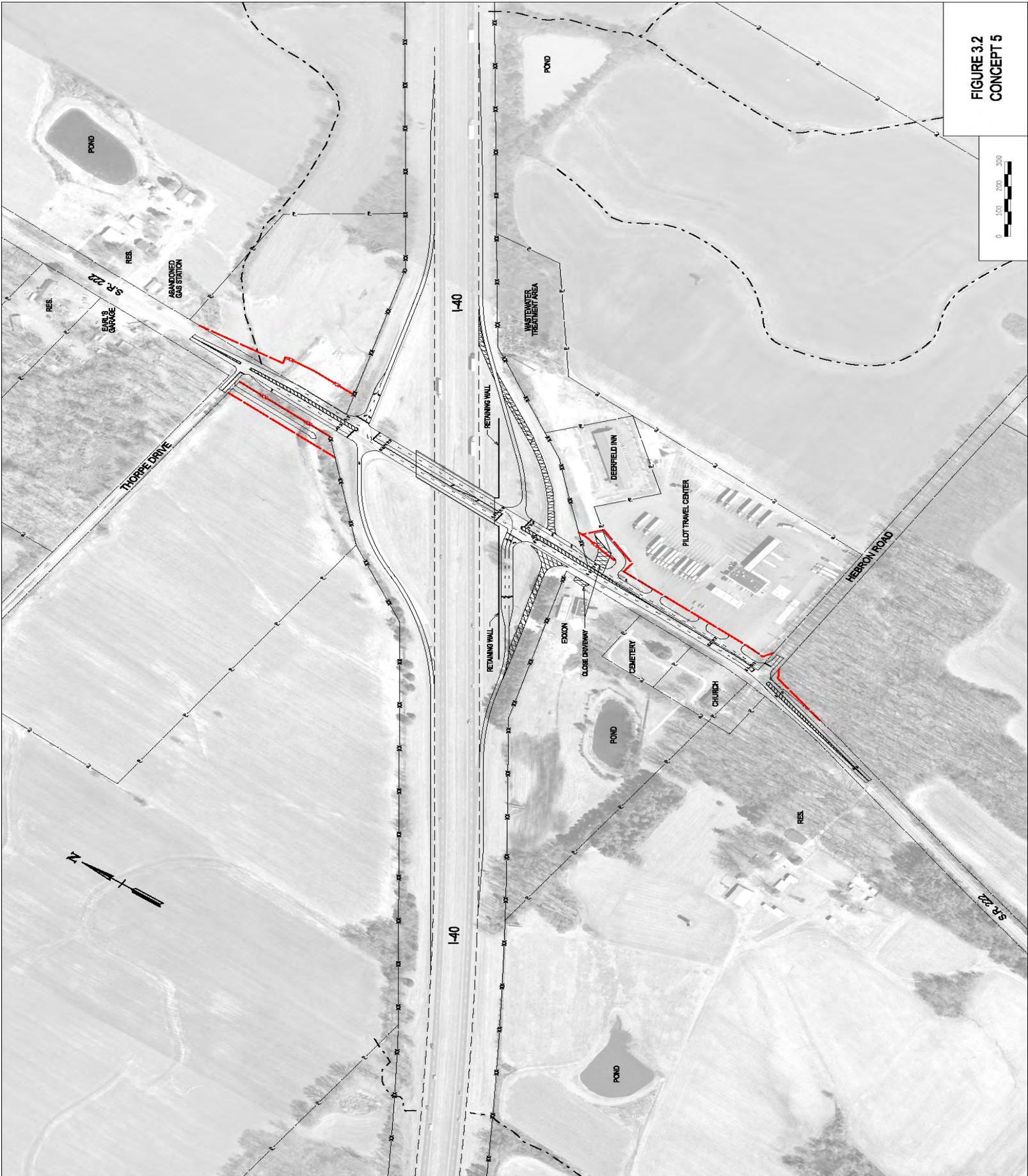


FIGURE 3.2
CONCEPT 5





United States Department of the Interior

FISH AND WILDLIFE SERVICE

446 Neal Street
Cookeville, TN 38501

March 22, 2012

Mr. Matt Richards
Tennessee Department of Transportation
Environmental Planning and Permits
James K. Polk Building, Suite 900
505 Deaderick Street
Nashville, Tennessee 37243-0334

Subject: FWS #12-CPA-0361. Proposed construction to the Interstate 40 Interchange at State Route 22; P.E. 24001-1147-44, PIN# 114219.00, Fayette County, Tennessee.

Dear Mr. Richards:

Thank you for your correspondence dated March 7, 2012, regarding the proposal for construction to the Interstate 40 Interchange at State Route 22 in Fayette County, Tennessee. The Tennessee Department of Transportation has requested a list of threatened or endangered species that may be present within the project area. Personnel of the U.S. Fish and Wildlife Service have reviewed the subject proposal and offer the following comments.

Endangered species collection records available to the Service do not indicate that federally listed or proposed endangered or threatened species occur within the impact area of the project. We note, however, that collection records available to the Service may not be all-inclusive. Our data base is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitat and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality. Therefore, based on the best information available at this time, we believe that the requirements of section 7 of the Endangered Species Act of 1973, as amended, are fulfilled for this species. Obligations under the Act must be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

Information available to the Service does not indicate that wetlands exist in the vicinity of the proposed project. However, our wetland determination has been made in the absence of a field inspection and does not constitute a wetland delineation for the purposes of Section 404 of the Clean Water Act. The Corps of Engineers should be contacted if other evidence, particularly that obtained during an on-site inspection, indicates the potential presence of wetlands.

If you have any questions regarding our comments, please contact John Griffith of my staff at 931/528-6481 (ext. 228) or by email at john_griffith@fws.gov.

Sincerely,

A handwritten signature in black ink that reads "Mary E. Jennings". The signature is written in a cursive style with a large, prominent initial "M".

Mary E. Jennings
Field Supervisor

Species Review

Project: Fayette County, I-40 at SR-222
 P.E. 24001-0147-44 PIN 114219.00

Date of field study: 3/22/2012

Date TDEC database checked: 3/28/2012

Completed by: Matt Richards, TDOT

Species reported within 1 mile radius of project:

Species Scientific and common names, followed by (A) for animal or (P) for plant	Status		Species is potentially present in R-O-W because: (A) it is listed by TDEC within ROW (B) habitat is present (C) observed during site visit (D) critical habitat present within ROW	Species is considered likely NOT present in R-O-W because: (A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	Accommodations to minimize impacts: (A) BMPs are sufficient to protect species (B) Special Notes are included on project plans (C) Individuals will be impacted. (D) Accommodations not practical due to broad habitat description or mobility of species	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
	Fed	TN					
None							

Species reported within 1-mile to 4-mile radius of project:

Species Scientific and common names, followed by (A) for animal or (P) for plant	Status		Species is potentially present in R-O-W because: (A) it is listed by TDEC within ROW (B) habitat is present (C) observed during site visit (D) critical habitat present within ROW	Species is considered likely NOT present in R-O-W because: (A) Present habitat unsuitable (B) Not observed during site visit (C) Original record questionable (D) Considered extinct/extirpated	Accommodations to minimize impacts: (A) BMPs are sufficient to protect species (B) Special Notes are included on project plans (C) Individuals will be impacted. (D) Accommodations not practical due to broad habitat description or mobility of species	Habitat (include blooming, breeding or other information; where found according to TDEC database; year last observed; reference)	Notes
	Fed	TN					
None							

Species Review

Project: Fayette County, I-40 at SR-222
 P.E. 24001-0147-44 PIN 114219.00

Migratory Birds

List ***significant concentrations*** of migratory birds encountered within the project area (rookeries, aggregations, nesting areas, etc).

Species (Scientific and Common Name)	Approximate No. of Nests (or Individuals)	Location of Nests (or Individuals) (Include Latitude & Longitude)	Nesting Dates and Reference	Photograph #
None				

USFWS letter: Yes X (attached) No ___ (explain)

Biological Assessment: Yes ___ (response letter attached; see below) No X

Species (scientific and common names)	USFWS conclusion ¹

¹ Choose from "no effect"; "not likely to adversely affect;" "likely to adversely affect;" if "likely to adversely affect" is chosen, indicate "no jeopardy to species and no adverse modification to habitat" or "jeopardy to species, or adverse modification to habitat" based on FWS concurrence letter

List **Natural Areas, management areas, refuges, or similar sites within or adjacent to project (attach 7.5 minute topographic map with pertinent boundaries of area marked)**

Area Name	Type of Area	Pertinent Notes
None		

List **locations that contain potential Indiana bat habitat (Provide an aerial that indicates areas checked)**

Location (description; lat/long or station number)	Tree Species	Photograph #
None		



STR-1 looking downstream from farm road crossing



SPG-1 looking west



WTL-2 looking east



WTL-3 looking west