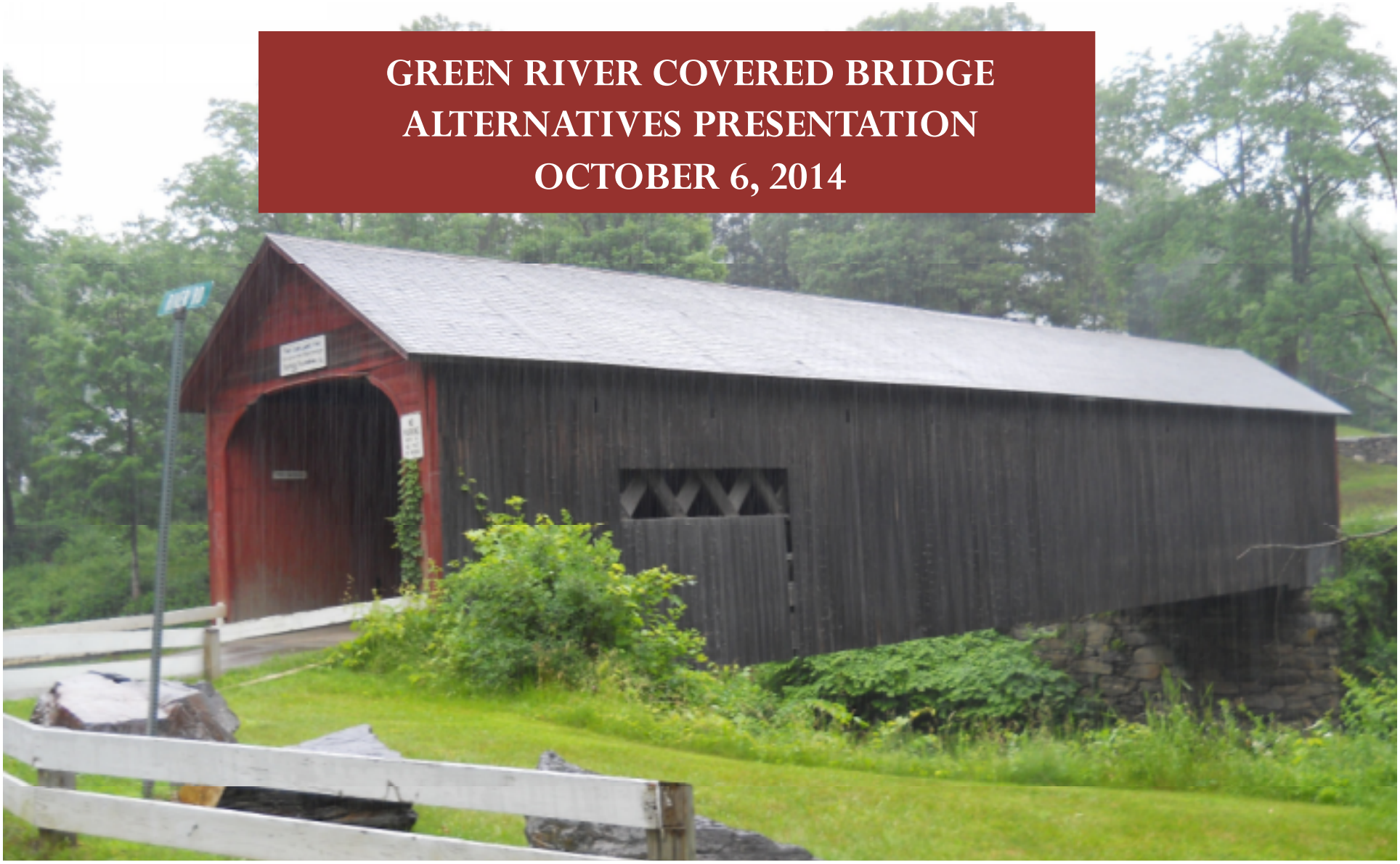
GREEN RIVER COVERED BRIDGE ALTERNATIVES PRESENTATION

OCTOBER 6, 2014



Prepared by:

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Presentation Outline

- Purpose and Need
- Scope of Study
  - Site Selection Methodology
- Resource Constraints
- Alternative Concepts
  - Design Criteria
- Funding
- Summary
- Questions

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Purpose and Need

Purpose

- Study Vehicular Crossing Options Near the Green River Covered Bridge (GRCB)

Need

- Unposted (Weight) River Crossing
- Unposted (Height) River Crossing
- 45+/- Properties on West Side of Green River
- Long Detour

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Site Selection Methodology

- **Alternatives Analysis Scope of Work**
- **Town Goals - 2010 Guilford Town Plan**
- **USGS Map Review**
- **Site Visits**
- **Local Concerns Meeting**
- **Cost, Constructability**

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Scope of Study

- **Half Mile Radius with GRCB at Center**
  - **2 Alignments to the North (A & B)**
  - **3 Alignments to the South (C, D, E)**
  - **Options at GRCB (F)**

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Scope of Study

Northerly Alternatives

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Site Selection Methodology

- **Alternative A**
  - **Within Study Limits**
  - **Utilizes Existing Bridge**
- **Alternative B**
  - **Shorter Roadway than A**
  - **Requires New Bridge**

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Scope of Study

Southerly Alternatives

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Site Selection Methodology

- **Alternatives D&E**
  - **Existing Access from Stage Road**
  - **Low Cost to Construct Road**
- **Alternative C**
  - **Similar to D&E without Conservation Easement**

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Resource Constraints

- **Resources- Parts of the Natural or Human Environment Impacted**
- **Resource Impacts- Can Require a Permit**
- **Constraints - Lengthy or Costly Permitting Processes**
- **Identified by Review of Online Listings, Data Sets and Maps**

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Resource Constraints

- **Review of Resources Included:**
  - **Vermont Agency of Natural Resources (ANR) Natural Resources Atlas Map Layers**
  - **Town of Guilford Data**
  - **State and National Register Database**
  - **Online tools/sources used: USFWS, NRCS, FEMA, and NWI**
  - **Limited Field Review**
  - **Mapping Uncertainties**

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Resource Constraints

Resources Identified in the Study Area:

- **Floodplains**
- **Wetlands and Floodable Soils**
- **Conserved and Managed Lands**
- **Protected Soils**
- **Private Wells**
- **Wildlife Habitat**
- **State Historic District and Listed Properties**
- **National Register of Historic Places Properties**

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Resource Constraints

- **Constraints Identified in the Study Area:**
  - **Wetlands, Floodplains and Protected Soils - Impacts May Require a Permit and Mitigation**
  - **Private Wells Should be Avoided**
  - **Conserved Land and Wildlife Habitat have Protection from Development**
  - **Impacts to State/National Register Properties**

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Resource Constraints

- **Resource Regulations**
  - **Floodplains and Special Flood Hazard Areas as identified by FEMA**
  - **Stream Alteration Permit**
  - **State and USACOE Wetland Permit**
  - **NRCS Farmland Protection Policy Act (FPPA)**
  - **NRCS Wildlife Habitat Incentive Program**
  - **National Historic Preservation Act of 1966**

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Design Criteria

- **AASHTO & VTrans Standards**
- **2013 Guilford Town Road and Bridge Standards**
- **Average Annual Daily Traffic (273 VPD)**
- **Design Speed – 30 mph**
- **Roadway Width – 28’ (2–11’ Lanes, 2–3’ Shldrs.)**
- **Gravel Roadway Surface**

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Design Criteria

- **New Bridge Criteria**
  - **VTrans Hydraulic Manual**
    - **1' Freeboard over Q_{25} for Local Roads**
    - **For Study Purposes Use 1' Above Floodplain**
- **Bridge Width**
  - **Two 11' Lanes, Two 3' Shoulders, Two 1'-6" Curbs**
    - **Total Bridge Width = 31'-0"**

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Alternative Concepts – C, D & E

- **Wetlands & Floodplains Present**
- **New Bridge and Roadway**
  - **Long Bridges Required to Span Floodplain**
- **Conservation Land**
- **Agricultural Lands**
- **Well Locations**
- **Partial Property Takings**

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Alternative Concepts – C, D & E

- ***Alternative C***

Alternative Concepts – D & E

- **Alternative D, E**

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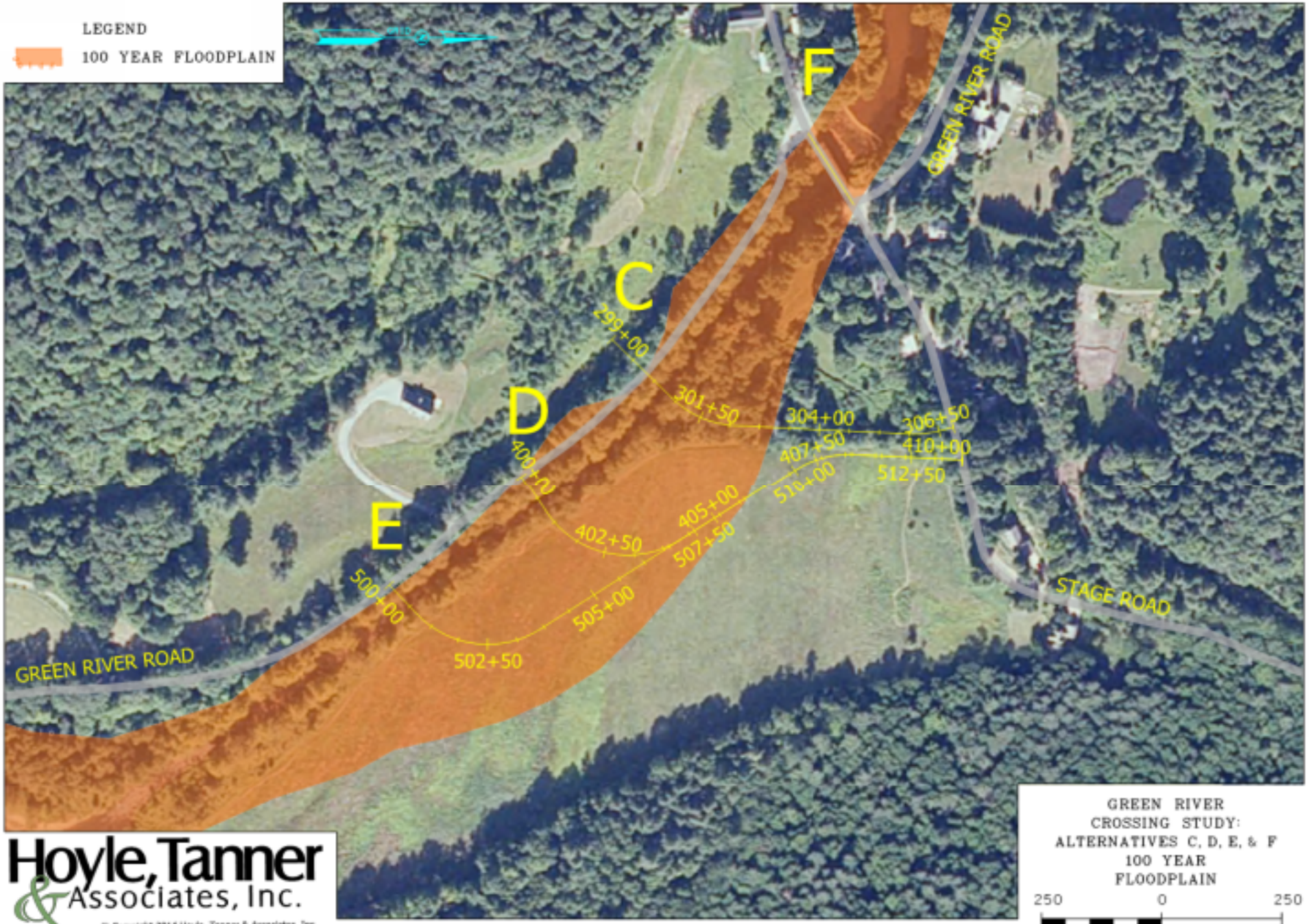

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GREEN RIVER CROSSING STUDY: ALTERNATIVES C, D, E, & F 100 YEAR FLOODPLAIN

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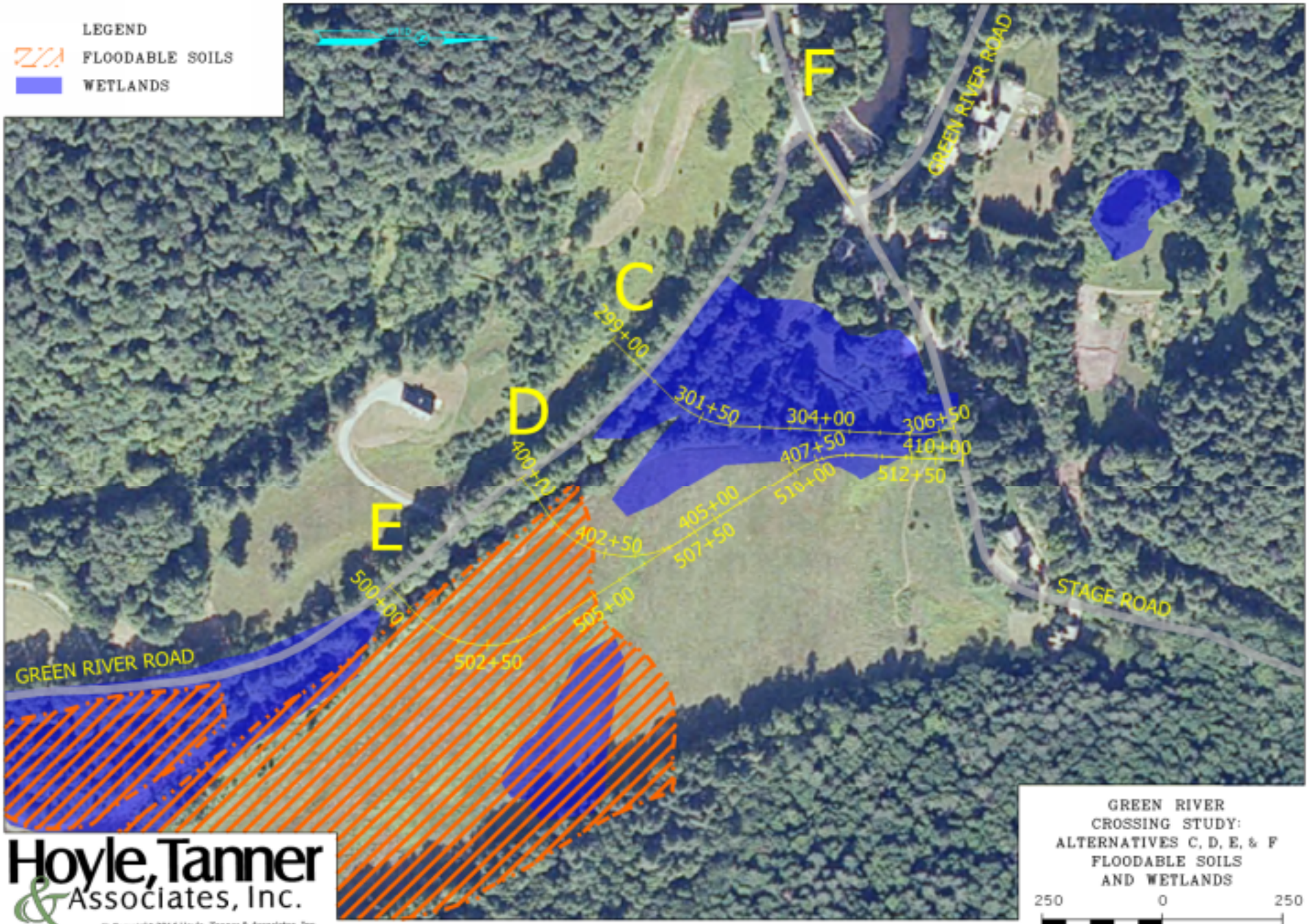

GREEN RIVER CROSSING STUDY: ALTERNATIVES C, D, E, & F FLOODABLE SOILS AND WETLANDS

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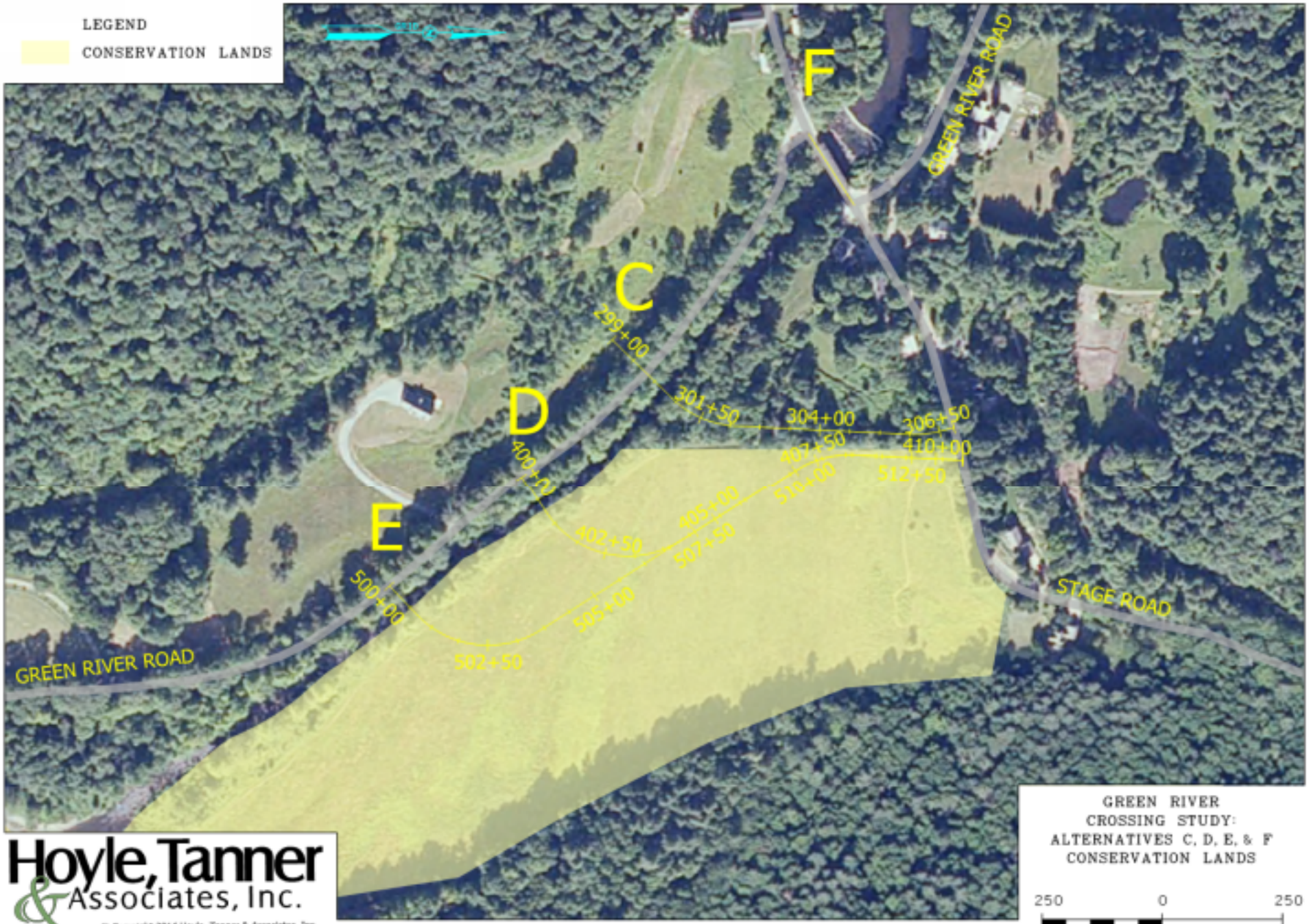

GREEN RIVER CROSSING STUDY: ALTERNATIVES C, D, E, & F CONSERVATION LANDS

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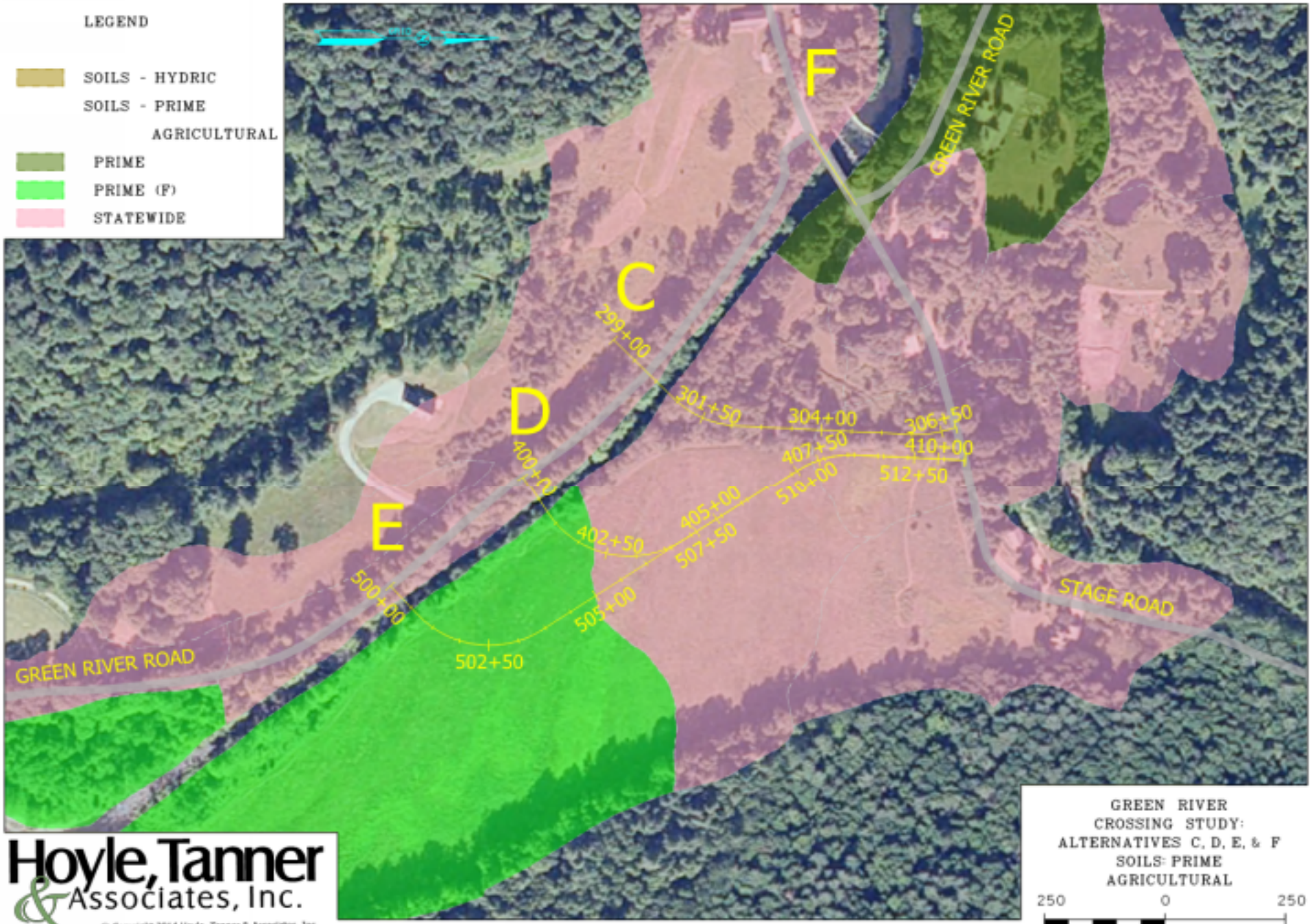

GREEN RIVER CROSSING STUDY: ALTERNATIVES C, D, E, & F SOILS: PRIME AGRICULTURAL

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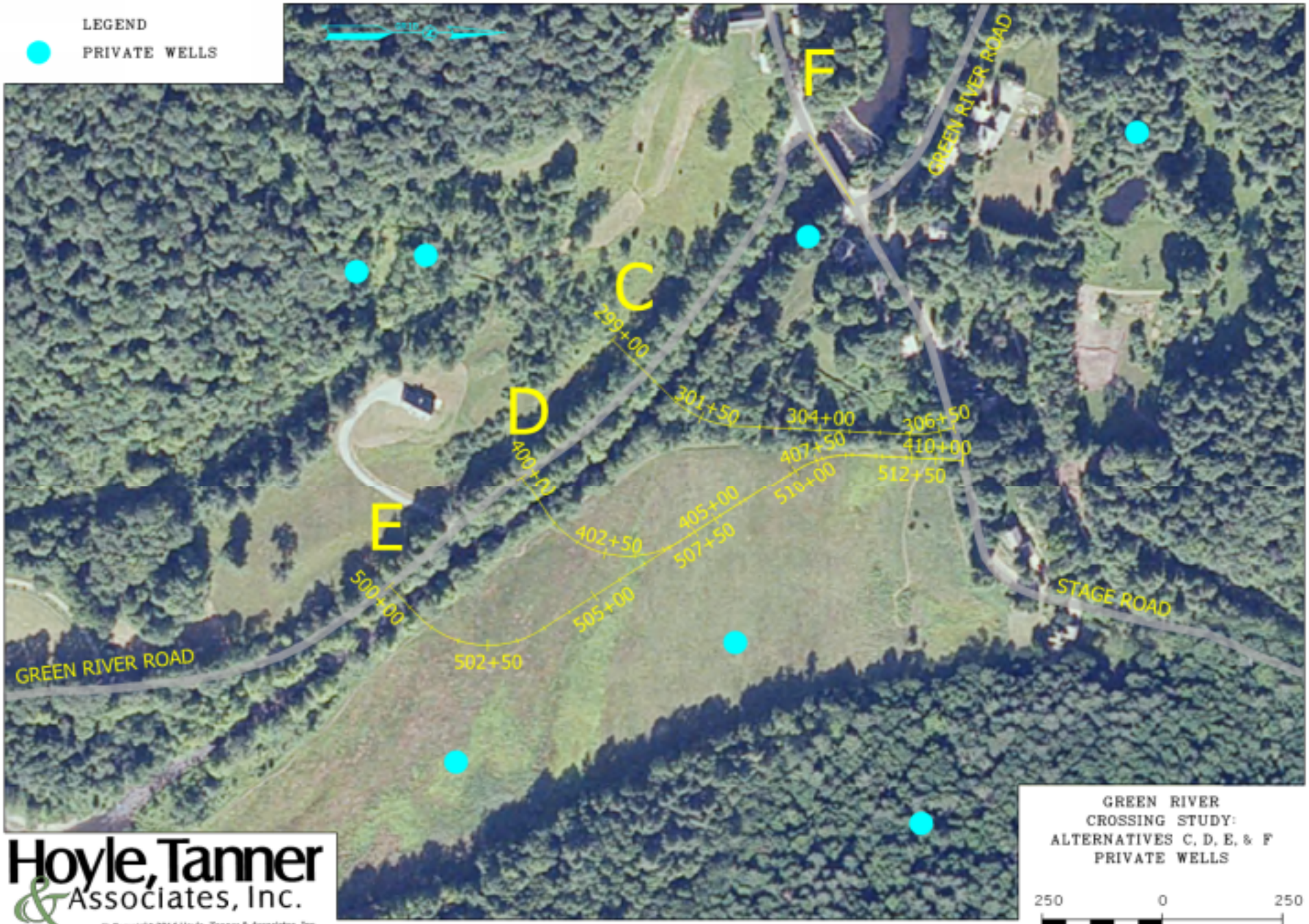

GREEN RIVER CROSSING STUDY: ALTERNATIVES C, D, E, & F PRIVATE WELLS

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Alternative Concepts – C, D & E

Summary

- **Town is Required to Avoid and Minimize Wetlands and 100 Year Floodplain Impacts**
- **D & E Cross Conservation Land**
- **300' – 600' Long Bridges**
- **Costly and Lengthy Permitting Process**
- **These Alternatives will be Eliminated from Further Consideration**

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Alternative Concepts – A

- **Minimal Impact to the 100-year Floodplain**
- **Requires**
  - **Clearing**
  - **Steep Grades (10-14%)**
  - **Significant Cuts and Fills**
  - **Utility Line Crossings**
  - **Retaining Walls**
  - **Partial Property Takings**

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Alternative Concepts – A

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Alternative Concepts – A

- **Existing Bridge No. 00009 over G. River**
- **In Good Condition**
- **Recommended Repairs Include:**
  - **Concrete Repair**
  - **Modification of Bridge and Approach Railing**
  - **Install Stone Fill at Abutment 2**
  - **Deck Joint Replacement**

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Alternative Concepts – B

- **Crosses over Floodplains – Minimal Impacts**
- **Requires**
  - **Clearing**
  - **Steep Grades (10-14%)**
  - **Significant Cuts and Fills**
  - **Utility Line Crossings**
  - **Partial Property Takings**

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Alternative Concepts – B

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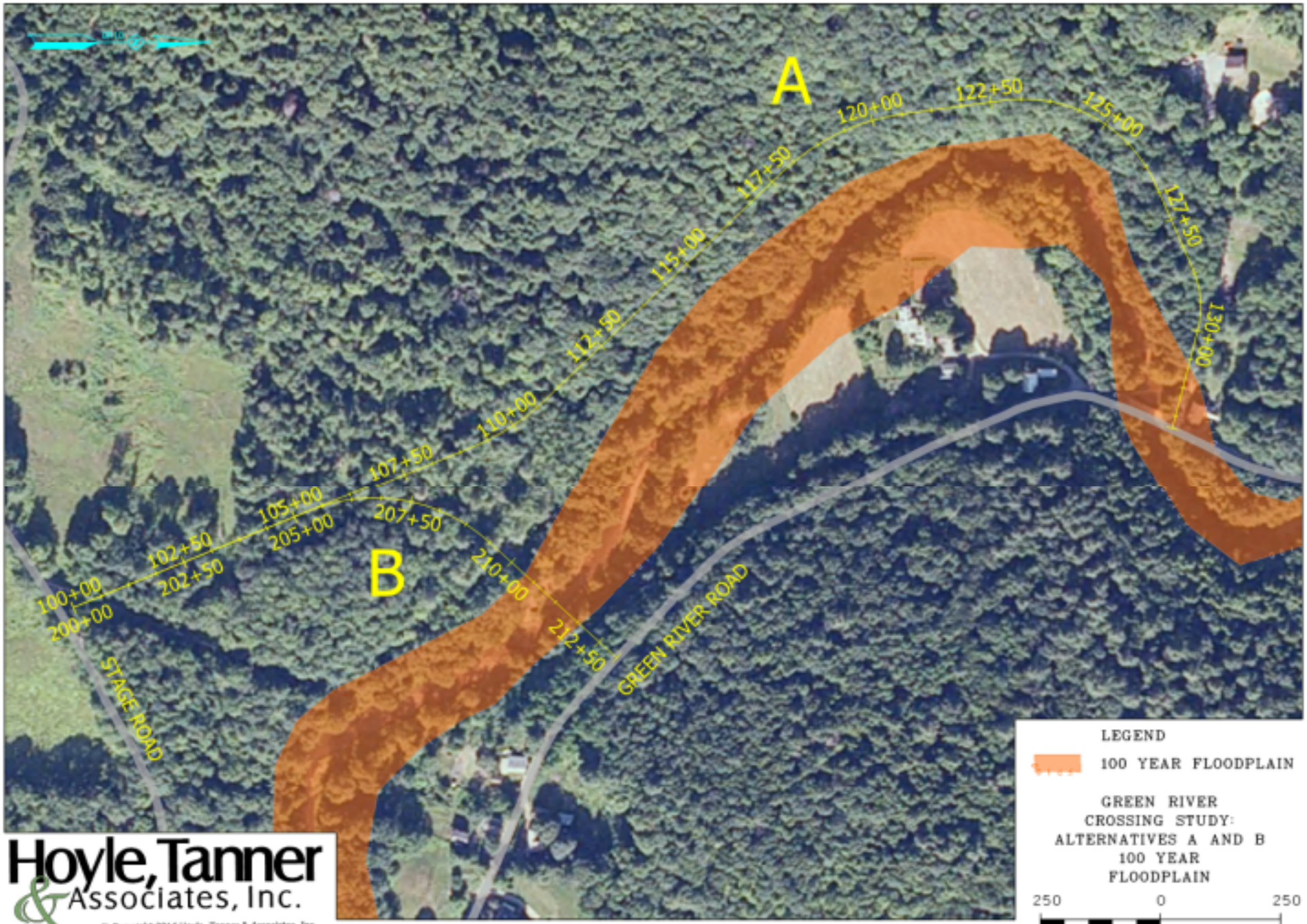

LEGEND

100 YEAR FLOODPLAIN

GREEN RIVER CROSSING STUDY: ALTERNATIVES A AND B 100 YEAR FLOODPLAIN

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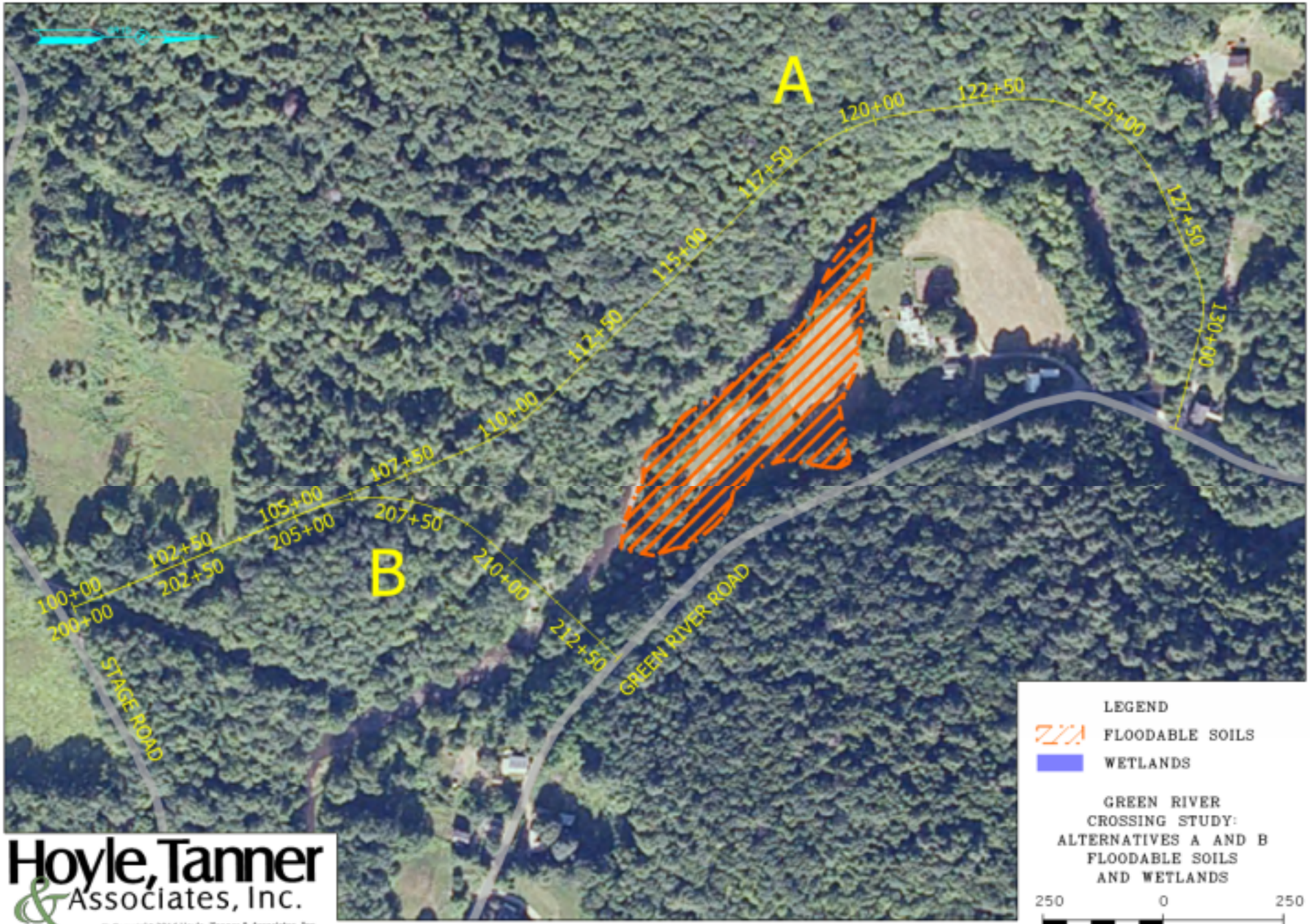

LEGEND

FLOODABLE SOILS

WETLANDS

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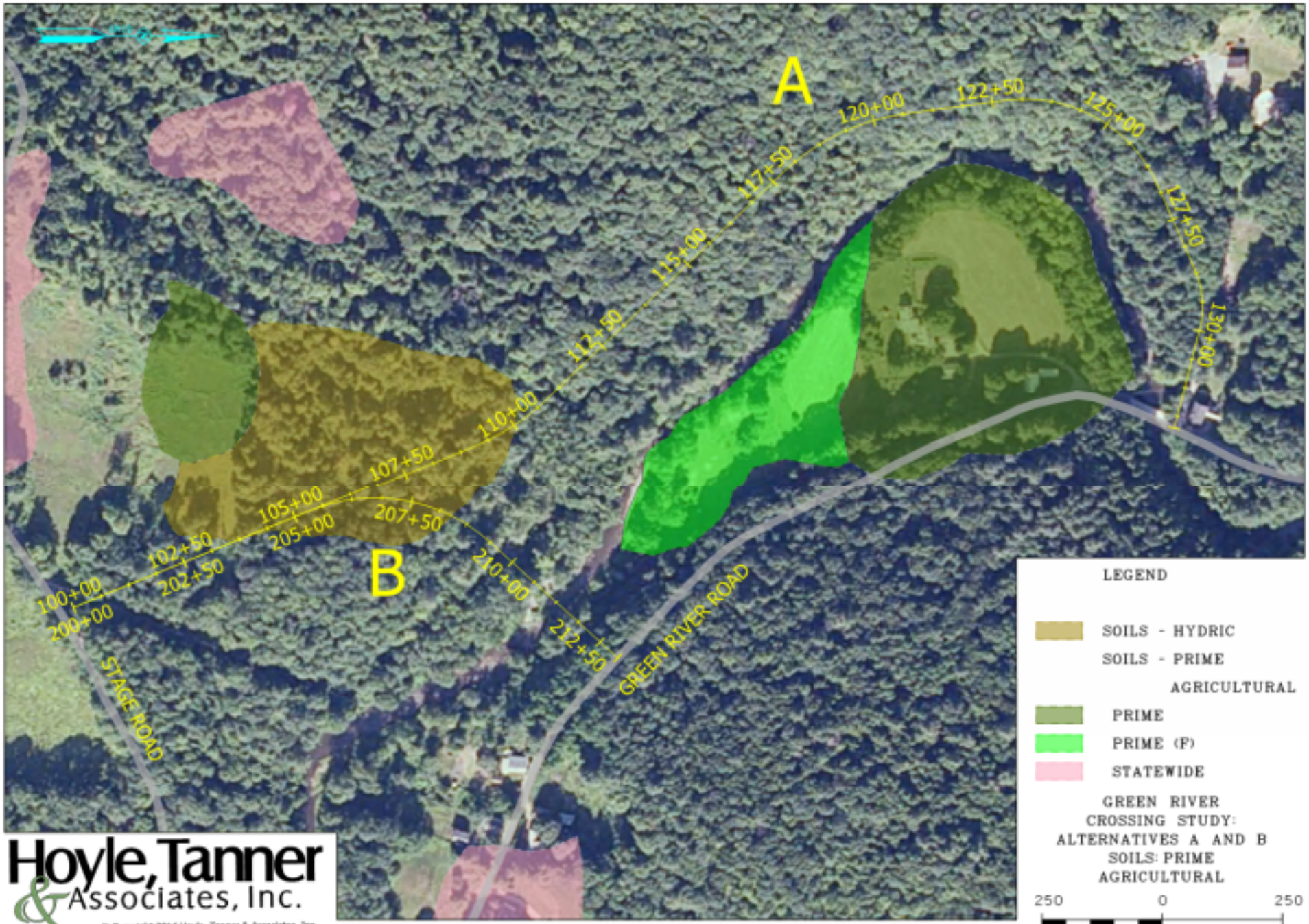

LEGEND

SOILS - HYDRIC

SOILS - PRIME AGRICULTURAL

PRIME

PRIME (F)

STATEWIDE

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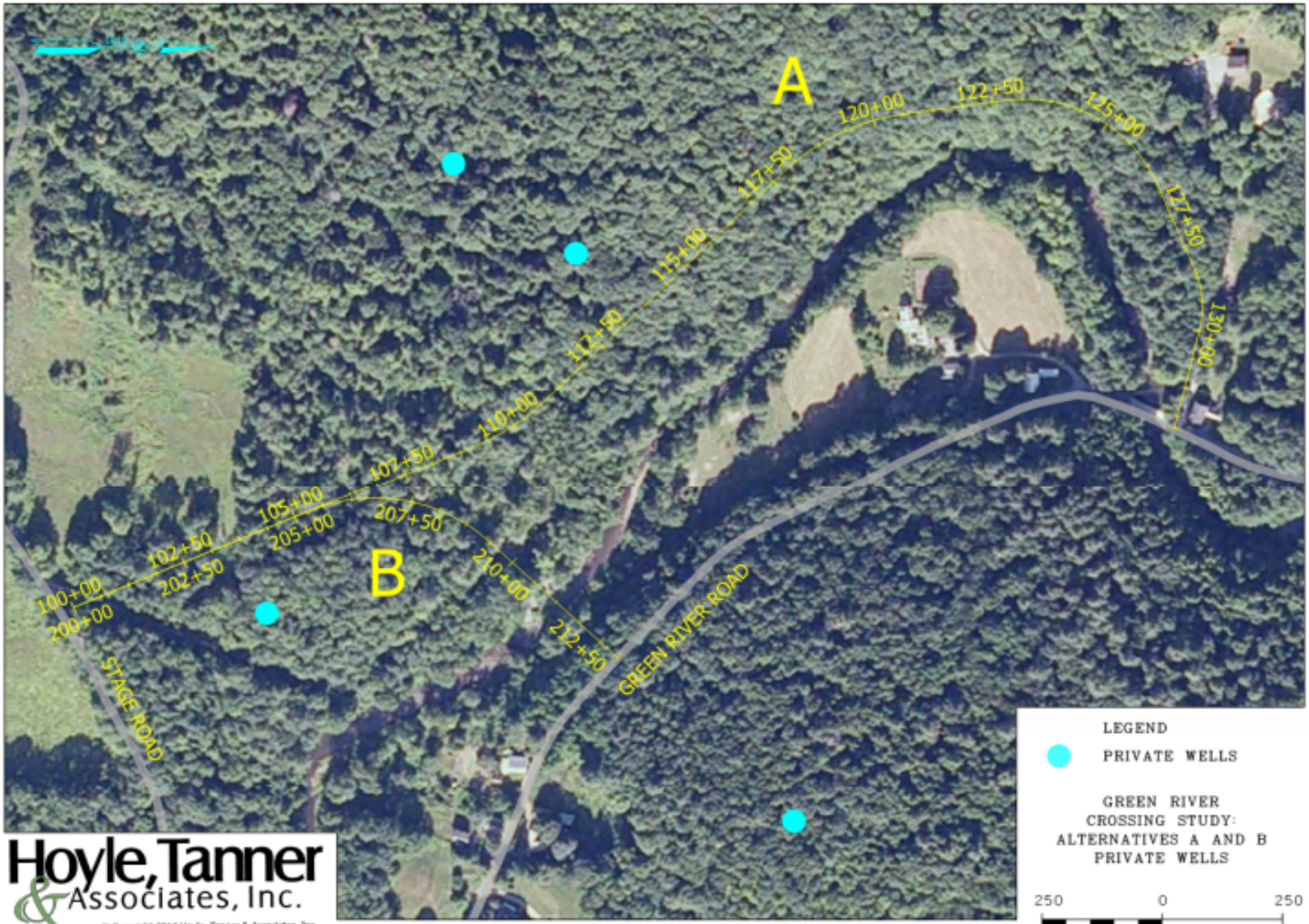

LEGEND

PRIVATE WELLS

GREEN RIVER CROSSING STUDY: ALTERNATIVES A AND B PRIVATE WELLS

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Alternative Concepts – B

- **Alternative B New Bridge**
  - **300’ Long, 2 Span Steel Stringer Bridge**
  - **High Abutments with Center Pier**
  - **Difficult Site to Construct Bridge**
  - **Utility Crossings**

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Alternative Concepts – A &B

Summary

Alternative A & B

- **Minimizes Floodplain Impacts**
- **No Wetland Impacts**
- **No Conservation Land**
- **Requires Partial Land Takings**
- **Total Estimated Cost of A $1.7M**
- **Total Estimated Cost of B $5.2M**
- **Estimated Project Duration of 3-5 Years**

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Green River Covered Bridge

- **Built in 1870 by Marcus Worden**
- **Listed in National Register of Historic Places in 1973**
- **Town Lattice Trusses (16'-7" o.c.)**
- **104' Long, 18'-6" Wide, Single Span Spanning Green River**
- **11'-6" Vertical Clearance**
- **Stone Masonry Abutments & Wingwalls**

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Alternative Concepts – F

- **Several Alternatives Evaluated at GRCB**
  - **Maintenance Repairs Only**
  - **Upstream or Downstream Bypass Bridge**
  - **8 Ton Live Load**
  - **12 Ton Live Load**
  - **20 Ton Live Load**
  - **Relocate GRCB / New Bridge**

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Alternative Concepts – F

- **Maintenance Repairs Only**
  - **Includes New Roof, Minor Truss Repairs, Approach Roadway and Railing Improvements**
  - **Funded Through Transportation Alternatives Program**
  - **No Changes to Current Live Load Posting**
  - **$315,000 Estimated Construction Cost**

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Alternative Concepts – F

- **Upstream or Downstream Bridge**
  - **NE – Archaeological Concerns**
  - **SE – Abutting Building**
  - **NW – Long Wingwall / Dam**
  - **SW – Grade / Intersection Concerns**

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Alternative Concepts – F

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Alternative Concepts – F

- **8 Ton Live Load**
  - **Previous Posting for GRCB; Recently Reduced**
  - **Detailed Structural Analysis is Required**
  - **With Some Repairs, 8 Tons is Achievable**
  - **Maintenance Repairs Still Required - $315,000**
  - **Estimated Total Project Cost $550,000**

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Alternative Concepts – F

- **12 Ton Live Load**
  - **Will Require Addition of:**
    - **Supplemental Steel Beams**
    - **Concrete Caps on Abutments**
    - **Raise in Approach Grade**
  - **VTrans Covered Bridge Committee May Not Approve**
  - **Maintenance Repairs Still Required - $315,000**
  - **Estimated Total Project Cost $1.6M**

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Alternative Concepts – F

- 20 Ton Live Load
- Will Require:
  - Supplemental Steel Beams
  - Replacement of Stone Masonry Abutments with Concrete
  - Raise in Approach Grade
- VTrans Covered Bridge Committee Likely Will Not Approve
- Maintenance Repairs Still Required - $315,000
- Estimated Total Project Cost $2.5M

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Alternative Concepts – F

- **Relocate GRCB / New Bridge Includes:**
  - **Relocation of the GRCB within Guilford**
  - **A Portion of Maintenance Repairs**
  - **Replacement of Stone Masonry Abutments with Concrete**
  - **Raise in Approach Grade**
  - **Installation of New Modern Bridge**
- **Option Has Significant Regulatory Concerns**
- **Estimated Total Project Cost $3.6M**

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Alternative Concepts – F

Summary

- **Maintenance Repairs Only - $315K; 1 Year**
- **8 Ton Live Load & Maint. - $550K; 2 Years**
- **12 Ton Live Load & Maint. - $1.6M; 2-3 Years**
- **20 Ton Live Load & Maint. - $2.5M; 3-4 Years**
- **Move GRCB / New Bridge & Maint. - $3.6M; 3-5 Years**

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Funding

- **Town Highway Bridge Program**
  - **10% Town Match (5% for Rehabilitation)**
  - **Local Match Capped at $0.50 Tax Rate**
  - **Assistance is not Limited for a Single Project**
  - **Windham Regional Commission Makes Rec.**
    - **Needs Exceeds Funding**
    - **Prioritization of Existing Infrastructure**
    - **Justifying New Bridge Would be Required**
    - **5-7+ Years from Acceptance to Construction**

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Funding

- **Town Highway Structures and Class 2 Roadway Program**
- **10% Local Match**
- **Structures**
  - **Limited to $175,000**
  - **Shorter Time to Construction (1-3 Years)**
- **Roadways**
  - **Only for Preservation of Existing Roadways**

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Funding

- **Transportation Alternatives Program**
  - **Historic Preservation and Rehabilitation**
  - **20% Local Match**
  - **Limited to $375,000 Total Project Cost**

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Summary

- **B, C, D & E Not as Viable as Other Alternatives**
  - **B – Most Expensive Alternative Studied**
  - **C, D & E – Regulatory Constraints**
- **Alternative A**
  - **$1.7M Estimated Project Cost**
  - **Estimated Project Duration of 3-5 Years**
  - **No Height or Weight Restrictions**
  - **Provides Second Point of Access to West Guilford**

TOWN OF GUILFORD VERMONT

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Summary

- **Alternative F**
  - **Estimated Project Cost Varies ($315K - $3.6M)**
  - **Project Duration; 1-5 Years**
  - **No Land Taking Required**
  - **Historic / Regulatory Approval Issues**

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Questions ?
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