Kentucky Transportation Cabinet
Expedited Bridge Replacement Study

PROJECT INFORMATION

County: CASEY
Road Name: UPPER BRUSH CREEK
Route Number: CR-1006
Bridge ID: 023C00002N
Bridge MP: 1.319

Highway Plan Project Description:
REPLACE BRIDGE ON UPPER BRUSH CREEK ROAD OVER BRUSH CREEK, 1.3 MI NORTHEAST OF JCT KY 1552; (STRUCTURALLY DEFICIENT, SR = 20.3) 023C00002N
Milepoint: 1.319

- [x] Roadway classified as collector or local.
- [x] ADT less than 1,500.
- [x] Bridge replacement at current location or adjacent to existing bridge.
- [x] Temporary Traffic Control maintained on existing structure: part-width construction or adjacent temporary traffic control.
- [x] Existing structure's hydraulic performance is adequate.
- [x] Proposed project is not in a FEMA Zone AE regulatory area. Although the project is in a FEMA Zone AE, Central Office Drainage Branch has reviewed the site and approved its inclusion.
- [ ]

Categorical Exclusion Level 1

Potential for Effects Resulting from Project ☐ None ☑ Low ☐ High

(If effects potential is low or high, describe how project meets CE criteria and means to address outstanding issues)

Impacts to archaeological resources cannot be fully assessed at this time. An investigation will be completed during detailed design. Impacts are not anticipated and should not impede project development. Potential Indiana bat habitat is present in the project vicinity. If it is determined that trees will be cut for this project, those impacts will be addressed under the IB PCMOA. An ACM survey will be conducted for any suspect bridge materials during detailed design. An ACE/LON is anticipated on this project and that permit application will be completed during detailed design and prior to letting to construction.

☑ Reevaluation required prior to construction

The project described above has been determined to meet the Categorical Exclusion criteria established in 23 CFR 771.17 and the FHWA/KYTC Categorical Exclusion Agreement.

Approved by: Jami West — District Environmental Coordinator — 10-14-13 Date

☑ Yes, this project meets the conditions for being an Expedited Bridge Replacement Project.

Recommended by: _____ District TEBM for Project Development

Approved by: _____ Director, Division of Planning

Programming Information

Item No: _____ *Federal Project No.:* _____
Program No.: _____ *UPN:* (Function) (County #) (Route) (MP to & from)

Version 9-20

Kentucky Transportation Cabinet
Expedited Bridge Replacement Study

I. PROJECT DATA

County: CASEY
Bridge ID: 023C00002N
Road Name: UPPER BRUSH CREEK
Bridge MP: 1.319
Route Number: CR-1006

Functional Class.: ☑ Local ☐ Collector ☐ Urban ☐ Rural

Route on ☐ NHS

Truck Class.:

% Trucks:

Terrain: Rolling

ADT (current): 206 (2010)

MPO Area: Not Applicable

Existing Bike Accommodations: Shared Lane

Ped: ☐ Sidewalk

Roadway Data:	**Existing**
No. of Lanes	2
Lane Width	8.2'
Shoulder Width	<3'
Max. Superelevation	1%
Minimum Radius	±50'
Maximum Grade	0.50%
Minimum Sight Dist.	±180'
Sidewalk Width(urban)	n/a
Clear-zone	<10'

Bridge Data:

Bridge Number	023C00002N
Sufficiency Rating	20.3
Total Length	83.99'
Width, curb to curb	19'
Span Lengths	1 -40', 1 -39'
Year Built	1969
Posted Weight Limit	12 TON
Structurally Deficient?	YES
Functionally Obsolete?	

Existing Rdwy. Plans available?
☐ Yes ☑ No
Year of Plans:

Existing Geotech data available?
☐ Yes ☑ No

Notes: 1 -40' AND 1 -39' PPCDU SPANS
BRIDGE INSP. REPORT FROM 1/2013 IN SECTION V BELOW.
NO OVERHEAD UTILITIES, BUT BURIED GAS LINES ON DOWNSTREAM SIDE

II. PROJECT SUMMARY

A. Purpose, Need & Project Estimate

In order to maintain connectivity, the purpose of the project is to replace the deficient bridge.

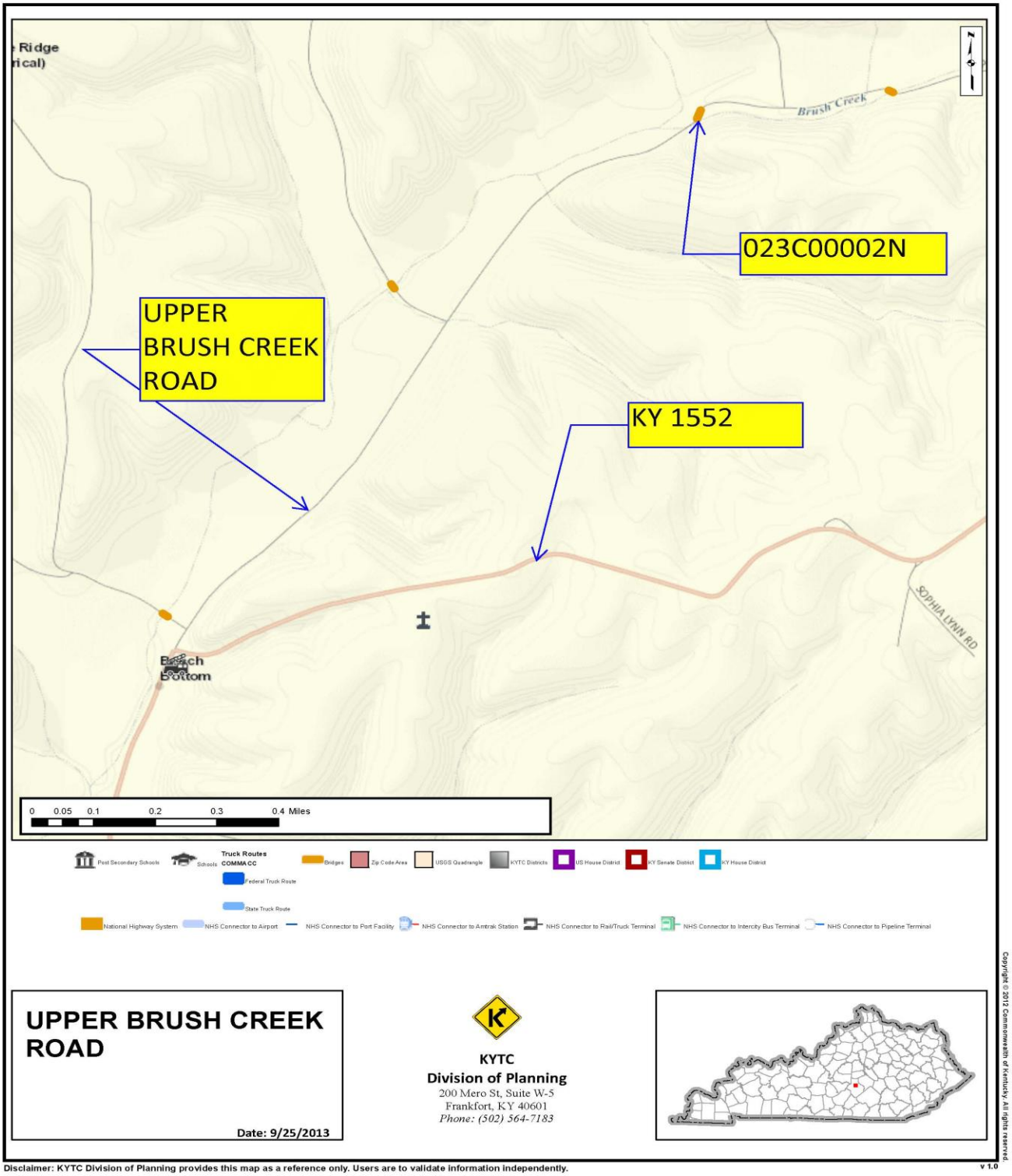
Project Estimate

Phase	Estimate
Design	$250,000
R/W	$75,000
Utilities	$25,000
Const	$420,000
TOTAL	**$770,000**

B. Project Approach

Replace entire bridge in-place. The terrain lends itself for a temp. diversion to be constructed if so chosen. A private drive is located close to one end of the bridge (see Pictures below). Bridge width and approach radius needs to be considered for truck and farm equipment traffic.

III. Photos and/or Maps



IV. Categorical Exclusion Level 1
Summary

Effects Potential (scale of effects and potential to influence project schedule)

None	Potential to significantly affect Air Quality
Low	Potential to significantly affect any cultural or archaeological resources
None	Potential to affect historic properties or other Section 4(f) resources
	☐ can be addressed through standard practices (programmatic agreements, deminimis, etc.)
Low	Potential to significantly impact any federally listed, threatened or endangered species
None	Potential to significantly effect properties with hazardous materials concerns
Low	Potential to significantly impact Waters of the U.S. or Commonwealth
Low	Potential to significantly affect traffic noise
None	Potential to require relocations or other significant socioeconomic impacts (travel patterns, land use, or planned growth)

A. Air Quality

Project is in: ☑ Attainment area ☐ Nonattainment or Maintenance Area ☐ PM 2.5 County

☑ No potential to significantly affect Air Quality (attach PM 2.5 and MSAT documentation, as appropriate or note below intent to complete prior to construction)

MSAT Documentation attached.

B. Archaeology

	Yes	No
1) Is all area to be affected by the project previously disturbed or within existing ROW? (If YES, STOP- Bridge is unlikely to adversely affect archaeological resources)	☐	☑
2) Are known archaeological sites present (project may potentially affect archaeological resources; Discuss with SME and provide comment below)	☐	☑

☐ No effect to archaeological resources

☑ Archaeological resources may be present; investigation to be completed during detailed design. Impacts to archaeological resources are not expected and should not impede project development.

☐ Archaeological impacts are of such potential complexity project schedule is likely to be adversely affected.

An archaeological investigation will occur during the design phase of this project. Impacts to archaeological resources is not anticipated, but will be verified during the investigation.

C. Threatened and Endangered Species

	Yes	No
1) Is the bridge over a KY DOW Special Use Water or within designated critical habitat? (If YES, STOP- Not eligible for EBRP; If NO, continue)	☐	☑
2) Does the county have federally listed fish and mussel species? (If NO, STOP; If YES, continue)	☑	☐
3) Does the bridge cross a stream with perennial flow? (If NO, STOP - No effect for mussels/fish species; If YES, continue)	☐	☑
4) Are any of the mussel/fish species typically found in smaller rivers and streams? (If NO, STOP; if YES, requires SME review to conduct Habitat Assessment)		
Additional Information required for possible effects assessment:	☐	☑

1) Will the bridge be replaced in the same location as existing?
2) Will the new bridge clear-span the stream?

☑ Biological concerns unlikely to impede project development (For all appropriate species, conduct Habitat Assessment/Biological Assessment prior to construction)

☐ Biological concerns are of such complexity that project schedule is likely to be adversely impacted

No Effect for Snuffbox (NE attached). Will use IB PCMOA if trees are cut.

D. Hazardous Materials	Yes	No
1) Are potentially contaminated sites present?	☐	☑
2) Does bridge require inspection for asbestos containing materials?	☑	☐

☑ Hazardous materials concerns are non-existent or routine in nature, will be addressed during detailed design and should not impede project development.

☐ Hazardous materials concerns are of such complexity that the project schedule is likely to be adversely affected.

Inspection for ACM to be conducted during the design phase and prior to construction.

E. Permitting

Check all that may apply: ☑ Waters of the US ☐ MS4 area ☐ Floodplain Impacts ☐ Navigable Waters Impacted

Are 401/404 Permits likely to be required? ☑ Yes ☐ No Impacts to: ☐ Wetlands ☑ Stream/Lake/Pond

☑ ACE LON ☐ ACE NW ☐ General WQC ☐ TVA

	Yes	No
1) Will the project affect more than 300 lf of stream? (If YES, STOP- Not eligible for EBRP; If NO, continue)	☐	☑
2) Will the project effect more than ½ acre of potential wetland? (If YES, STOP- Not eligible for EBRP; If NO, water related impacts not likely to impede project development)	☐	☑

☑ Will not significantly impact Waters of the U.S. or Commonwealth. Stream and wetland impacts, if any, are routine in nature and will not require individual permits; Any required permits will be acquired during detailed design. Project development should not be impeded.

☐ Stream and/or wetland impacts exceed nationwide and general WQC thresholds. Project schedule is likely to be adversely impacted (Not eligible for EBRP).

Application for 401/404 permits to be completed during design phase and prior to construction. ACE/LON anticipated.

F. Noise	Yes	No
1) Are existing or planned noise sensitive receptors adjacent to the proposed project? (If NO, STOP- No effect for Noise Impacts; If YES continue)	☑	☐
2) Is this considered a "Type I Project" according to the KYTC Noise Analysis and Abatement Policy?	☐	☐

☐ No noise related impacts predicted for the project

☑ Noise related impacts are unlikely but will be further assessed during detailed design prior to construction. Further assessment should not impede project development.

☐ Noise related impacts are of such complexity that project schedule is likely to be adversely affected.

There is one residential area near the project that may be temporarily impacted by noise associated with construction activities. Temporary noise impacts will cease upon construction completion.

G. Socioeconomic	Yes	No
1) Are there any relocations required for construction of the project? (If YES, STOP- Does not meet criteria for EBRP; If NO Continue)	☐	☑
2) Will project require more than approximately one acre of fee simple R/W? (If YES, STOP- Project Does not meet criteria for EBRP; If NO, continue)	☐	☑

	Yes	No
3) Is ROW required from any federal agency?	☐	☑
4) Will project cause disproportionately high and adverse effects on any minority or low-income population in accordance with the provision of E.O. 12898 and FHWA Order 6640.23	☐	☑
5) Will project significantly affect land use, travel patterns or planned growth?	☐	☑

☑ Will have no significant Socioeconomic impacts

☐ Socioeconomic impacts are unlikely but will be further assessed during detailed design prior to construction. Further assessment should not impede project development.

☐ Socioeconomic impacts are of such complexity that project schedule may be adversely affected.

H. Section 106, 4(f) or 6(f) Resources

The following are present on the project:	Yes	No
1) Does the project affect a park, wildlife refuge or recreation area (If YES, STOP- Not eligible for EBRP; If NO continue)	☐	☑
2) Is the bridge a truss (If YES, STOP- Not eligible for EBRP; if NO continue)	☐	☑
3) Is the bridge or do any of the surrounding properties appear to be greater than 50 years old? (If YES continue; If NO, STOP: No Effect to Historic Properties)	☑	☐
4) Was the bridge constructed after 1945? (If YES continue; If No, STOP- project will require SME review; If YES, continue)	☑	☐
5) Is the bridge of a common type covered by the FHWA Program Comment? (If YES continue; If NO, STOP-project will require SME review)	☑	☐
6) Are there any buildings or potentially important features (wells, barns, cemeteries, etc.) of the surrounding property that are more than 50 years old that will be impacted by the project (If YES, STOP - project will require SME review; If NO, STOP: No Effect/No Adverse Effect to historic properties)	☐	☑

☑ No potential to affect cultural historic resources, Section 4(f) or Section 6(f) resources

☐ No Potential to affect Section 4(f) or Section 6(f) resources other than cultural historic resources, which can be addressed through standard practices (Programmatic 4(f), deminimis, etc.) and should not impede project development

☐ Affects to cultural historic resources are of such complexity that the project schedule may be adversely affected

Consulted DEA Historian to confirm no impacts to cultural historic resources. See attached email coorespondence.

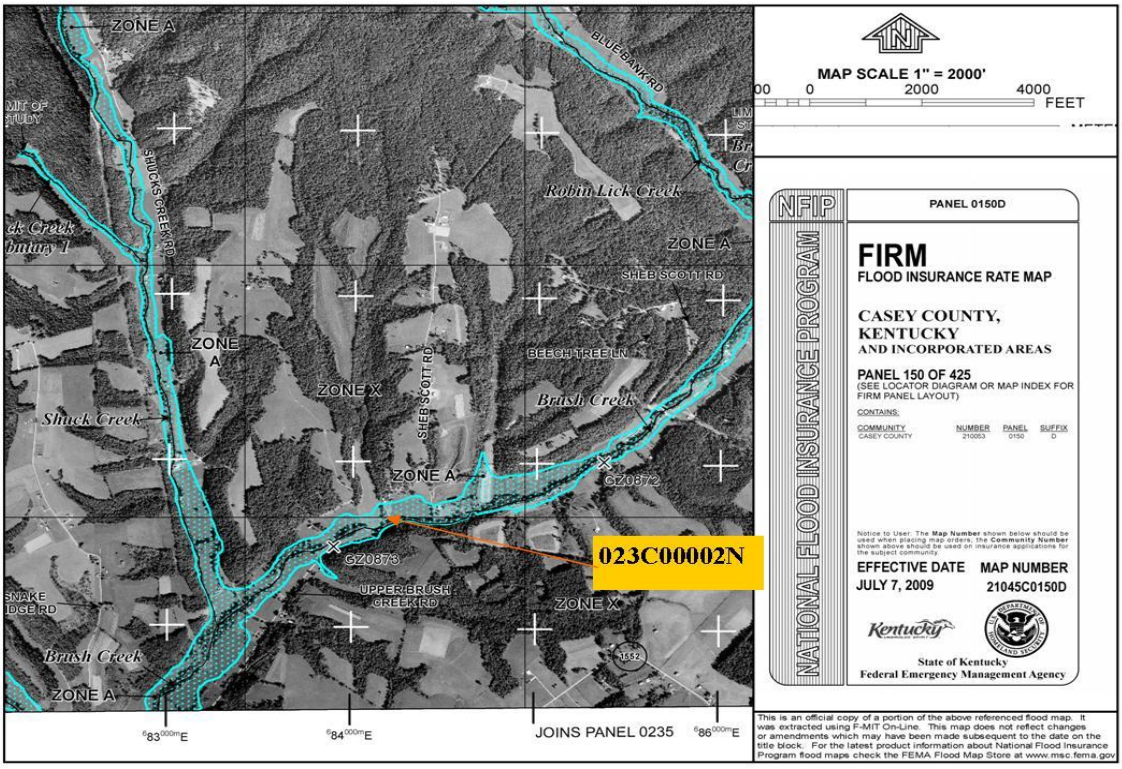
V. Additional Photos and/or Maps

V. Additional Photos and/or Maps

V. Additional Photos and/or Maps

Buried gas line markers in background

V. Additional Photos and/or Maps



V. Additional Photos and/or Maps

023C00002N

KYTC Bridge Inspection Report

Summary:
Inspection Date: 10/16/12
Inspector: LLINKES (135)
Primary Type: Substandard (12 Months)

Types of Inspections Performed:

National Bridge Inventory:	Y
Element:	Y
Fracture Critical:	N
Underwater:	N
Other Special:	N

Inspector Signature:

District Review Date: 1/8/13
District Reviewer: JCOE (24)

IDENTIFICATION

Bridge ID (8):	023C00002N	District Number:	8
Route Carried (7):	UPPER BRUSH CREEK	County (3):	23 Casey
Mile Point:	1.319	Feature Intersected (6):	BRUSH CREEK
Location (9):	1.35 MI NORTH OF KY 1552	Road Name:	UPPER BRUSH CREEK RD
Structure Description:	83.99 Foot - 2 Span Prestressed concrete Slab		

NBI CONDITION

Deck (58):	4
Superstructure (59):	4
Substructure (60):	4
Culverts (62):	N
Channel/Protection (61):	4

SCHEDULE TAB

Schedule:	Required (Y/N)		Last Date		Frequency	Next Date
NBI (90):			10/16/12	(91):	12 mos	10/16/13
Fracture Critical (92A):	N	(93A):	1/1/01	(92A):	mos	1/1/01
Underwater (92B):	N	(93B):	1/1/01	(92B):	mos	1/1/01
Other Special (92C):	N	(93C):	1/1/01	(92C):	mos	1/1/01
Elemental:	NA				12 mos	10/16/13

Load Rating and Posting

Truck Type	Typ I	Typ II	Typ III	Typ IV	Gross
Recomm. Posting:	12	12	12	12	12
Field Posting:	-1	-1	-1	-1	12

Posting Status (41): P Posted for load
Signs Posted: Cardinal: Y Non-Cardinal: Y

WATERWAY

Scour Critical (113):	8
Observed 113 Rating:	4
Waterway Adeq. (71):	8

DECK/WEARING SURFACE

Deck Type (107):	2 Concrete Precast Panel								
Wearing Surface/Protective System (108):	Type:	1	Membrane:	0	Protection:	1			
Traffic Safety Features (36):	Bridge Rail:	1	Transition:	0	Appr. Rail:	0	Rail Ends:	0	
Overlay:	N								
Overlay Type:	-1	(34) Skew:	30						
Overlay Thickness:	-1	(51) Curb-to-Curb Width:	19						

Vertical Clearances

Minimum Vertical Overclearance (53):	99.99
Minimum Vertical Underclearance (54):	0.00
Maximum Vertical Clearance (10):	99.99
Minimum Vertical Clearance:	99.99

Sufficiency Ratings

SR:	20.3	SD/FO:	1 Structurally Deficient

Element Condition State Data

Elm/Env	Description	Units	Total QTY	QTY CS1	QTY CS2	QTY CS3	QTY CS4	QTY CS5
104/1	P/S Conc Box Girder	LF	588.00	0.00	200.00	360.00	28.00	0.00
12/1	Bare Concrete Deck	SF	1680.00	0.00	0.00	1680.00	0.00	0.00

V. Additional Photos and/or Maps

023C00002N

KYTC Bridge Inspection Report

Summary:
Inspection Date: 10/16/12
Inspector: LLINKES (135)
Primary Type: Substandard (12 Months)

Types of Inspections Performed:

National Bridge Inventory:	Y
Element:	Y
Fracture Critical:	N
Underwater:	N
Other Special:	N

Element Condition State Data

Elm/Env	Description	Units	Total QTY	QTY CS1	QTY CS2	QTY CS3	QTY CS4	QTY CS5
210/1	R/Conc Pier Wall	LF	22.00	7.00	8.00	6.00	1.00	0.00
215/1	R/Conc Abutment	LF	97.00	0.00	70.00	25.00	2.00	0.00
301/1	Pourable Joint Seal	LF	20.00	0.00	0.00	20.00	0.00	0.00
334/1	Metal Rail Coated	LF	168.00	100.00	68.00	0.00	0.00	0.00
361/1	Scour Smart Flag	EA	1.00	0.00	0.00	1.00	0.00	0.00
503/1	Curbs	LF	168.00	20.00	125.00	15.00	8.00	0.00
608/1	Long. Shear Keys	EA	1.00	0.00	0.00	1.00	0.00	0.00

Element Condition State Data

Str	Unit	Elm/Env	Description	Description
1		104/1	P/S Conc Box Girder	At 2012 inspectiopn, the bottom of Beams 1, 2, 6, & 7 had spalls with exposed steel cable. There are longitudinal cracks forming (ed) along the faioing/failed keys, due to excessive mositure on the beams. DETAILED BEAM INFORMATION CAN BE FOUND IN THE 2006 INSPECTION REPORT. *Updated photos are on media tab, dated 2012 INPSECTOR AND BRIDGE ENGINEER ARE IN AGREEMENT THAT, DUE TO THE CONDITION OF THE PPC BEAMS, THIS BRIDGE SHOULD BE REPLACED. THIS OFFICE PROVIDED THE COUNTY WITH A COST ESTIMATE FOR IT'S REPLACEMENT, DATED 10-2007.
1		12/1	Bare Concrete Deck	The surface has small to med sized popouts throught, with spall in the deck surface where rebar is exposed. See 2012 photos of top of Beam 4 as example. The deck is dirty and scattered with gravel & has vegetation growing at the curblines.
1		210/1	R/Conc Pier Wall	PIER WALL IS A POURED IN PLACE CONC. SLAB WALL. THE POUR WAS ROUGH, LEAVING MINOR TO MODERATE SCALE AND MORE ADVANCED DETERIORATION AT THE FLOW LINE.
1		215/1	R/Conc Abutment	ABUTMENTS HAVE MODERATE CRACKS AT THEIR HAUNCHES AND FINE CRACKING OF THEIR BREASTWALLS. BOTH ARE DIRTY AND DISCOLORED.
1		301/1	Pourable Joint Seal	THE JOINT OVER P-2 HAS FAILED COMPLETELY AND NEEDS REPLACED.
1		334/1	Metal Rail Coated	G-RAIL IS RUSTY AND HAS VEHICULAR DAMAGE. NEEDS REPLACED OR REPAIRED.
1		361/1	Scour Smart Flag	SCOUR IS PRESENT UNDER ENTIRE LENGTH OF A-3 AND P-2 FOOTERS, MEASURING AS MUCH AS 1 1/2' (+/-) DEEP AND BACK UNDER THE FOOTERS AS MUCH AS 2 1/2', WITH PILING EXPOSED AT THE NW CORNER. TWO ROWS OF PILING ARE VISIBLE AND ARE RUSTY W/BEGINNING LOSS OF SECTION NOTED. THE CHANNEL HAS ALSO SCOURED IT'S BANKS, BOTH UP AND DOWNSTREAM, IN EFFECT WIDENING THE STREAM TO A POINT THAT EXCEEDS THE STRUCTURE'S WIDTH. *Updated photos can be seen on media tab, dated 2012.
1		503/1	Curbs	CONC. CURB HAS MINOR CRACKING, W/SMALL SPALLED CORNERS AT BOTH APPROACHES. Curb = 6"
1		608/1	Long. Shear Keys	Failed.

Structure Notes

IT IS RECOMMENDED BY THE DISTRICT BRIDGE ENGINEER THAT THIS STURCTURE BE REPLACED, DUE TO THE CONDITION RATINGS OF THE PRECAST BEAMS.-2008

Beams contiune to deteriorate, with 3 additional beams showing spalling with exposed cable at 2011 insp. (this in additiona to the previous reported damaged beams) * See ELE.# 104 & 2011 Photos.--RRH

V. Additional Photos and/or Maps

023C00002N

KYTC Bridge Inspection Report

Summary:

Inspection Date: 10/16/12
Inspector: LLINKES (135)
Primary Type: Substandard (12 Months)

Types of Inspections Performed:

National Bridge Inventory:	Y
Element:	Y
Fracture Critical:	N
Underwater:	N
Other Special:	N

Inspection Notes

Both 12T Gross weight limit posting signs are in place & legible.10-16-2012

Work Candidates

Inspector Candidates:

Candidate ID:	Status	Priority	Assigned	Action	Elem	Date Recommended
A-KYTC-181A4F12-00000013	Approved	High	Unassigned	11	0	10/16/12

VI. CE1 Attachments

Mobile Source Air Toxics Impact

1.0 Qualitative Analysis

The County Bridge 023C00002N in Casey County, Kentucky involves the replacement of the Upper Brush Creek Road bridge structure and approaches over Brush Creek. It is located North of Liberty.

Based on the current year traffic forecasts (206 ADT), the replacement of the Upper Brush Creek Road bridge structure and approaches over Brush Creek is an exempt project according to 40 CFR 93.126 with negligible to low potential MSAT effects as defined by the February 3, 2006 FHWA Interim Guidance on Air Toxics Analysis in NEPA documents. For the Selected Alternative identified in the condensed CE Lv1 document included in the DNA document for the Expidited Bridge Replacement Program, the amount of MSATs emitted would be proportional to the vehicle miles traveled (VMT), assuming that other variables such as fleet mix are the same for each alternative that was assessed. The VMT estimated for the Selected Alternative is virtually the same as that for the No Build Alternative, because the nature of the project itself is not anticipated to increase the volume of traffic. In the event of an increase in traffic and emissions by something other than this project, the emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

For the Selected Alternative, emissions would likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The Upper Brush Creek Road bridge replacement project will have no effect on moving traffic closer to nearby homes, schools and businesses; therefore, for this project, there will be no localized areas where ambient concentrations of MSATs could be higher than the current conditions. However, as discussed above, the magnitude and the duration of any temporary potential increases compared to the current conditions cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is constructed, and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Selected Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

2.0 Uncertainty Analysis

Air toxics analysis is an emerging field and current scientific techniques, tools, and data are not sufficient to accurately estimate human health impacts that would result from a transportation project in a way that would be useful to decision-makers. For a further explanation of uncertainty analysis as it relates to MSATs for transportation related projects see *Appendix C – Prototype Language for Compliance with 40 CFR 1502.22* (attached).

U.S. Department of Transportation
Federal Highway Administration

FHWA Home | Feedback

Environment

FHWA > HEP > Environment > Air Quality > Air Toxics > memo

APPENDIX C-Prototype Language for Compliance with 40 CFR 1502.22

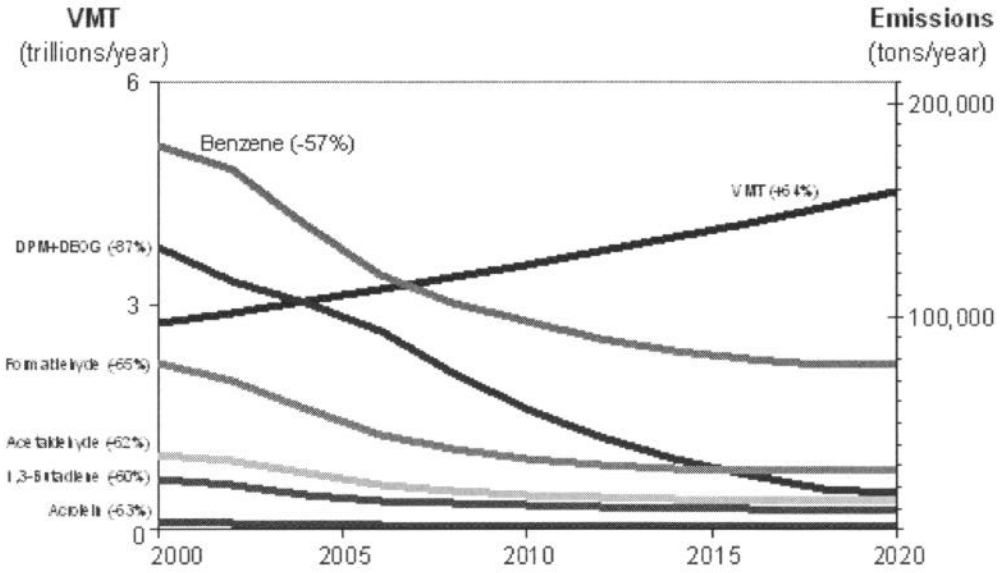
Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in the following graph:

U.S. Annual Vehicle Miles Traveled (VMT) vs. Mobile Source Air Toxics Emissions, 2000-2020



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: Highway Statistics 2000, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

Unavailable Information for Project Specific MSAT Impact Analysis

This [EA or EIS] includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this [EA or EIS]. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Information that is Unavailable or Incomplete. Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

- **Emissions:** The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

  These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

- **Dispersion.** The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

- **Exposure Levels and Health Effects.** Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs. Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.
- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- **Diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.
- **Diesel exhaust** also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems[1]. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of impacts based upon theoretical approaches or research methods generally accepted in the scientific community. Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

In this document, FHWA has provided a quantitative analysis of MSAT emissions relative to the various alternatives, (or a qualitative assessment, as applicable) and has acknowledged that (some, all, or identify by alternative) the project alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

[The Office of Environment, Planning and Realty can provide additional supporting documents for review and inclusion in the administrative record.]

---

[1] South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality); NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.

KENTUCKY TRANSPORTATION CABINET	**Kentucky Transportation Cabinet** **Federal Highway Administration** **NO EFFECT FINDING**		U.S. Department of Transportation Federal Highway Administration
KYTC Item No:	**023C00002N** -	**Route:**	**Upper Brush Creek Road**
Quadrangle(s):	**Liberty, KY**	**County:**	**Casey**

Project Description: (Type of improvement, areas to be impacted, crossroad improvements, easements, etc.)

Bridge (023C00002N) replacement on Upper Brush Creek Road over Brush Creek (proposed Expidited Bridge Replacement Project)

COUNTY LISTED SPP:

Indiana bat (USFWS); Snuffbox (KDFWR, KSNPC)

Methodologies: (Methods of assessment, who, what, when, resources, etc.)

Site visit (Jami West, D8 Environmental Coordinator), photographs, consultation with DEA Biologist, Nathan Click and Habitat Assessment Manual

Results: (Compare habitat used by listed species with available habitat)

Determinations:

The snuffbox usually inhabits stream bottoms with substrates composed of stable sand and cobble in moving water. They can be found in small streams to medium sized rivers. It has also been found in impoundments, but this is probably not preferred habitat. This species bury themselves deeply in the substrate. It has been collected in water as shallow as 2 inches but likely prefers deeper water of 2 feet or more in moderate current. Brush Creek is currently predominantly dry with the exception of some pooling in low spots. It is not a suitable habitat for mussel species.

It is not anticipated that any potential IB habitat trees will be impacted by this project, however if during the design process, it is determined that trees will be impacted, they will be addressed under the IB PCMOA.

The project has been assessed in accordance with the provisions of Section 7 of the Endangered Species Act. As a designated representative of the FHWA, the KYTC has determined that the project will have No Effect on any listed species or their critical habitat, and further Section 7(a)(2) consultation with the Service is not required.

Jami West
KYTC Signature

10-8-13
Date

Jami B. West
Print Name

E.A.T.S. Milestones updated

Name Date

09/24/2013

09/24/2013

09/24/2013

09/24/2013

U.S. Fish & Wildlife Service
Kentucky Ecological Services Field Office

U.S. Fish & Wildlife Service
330 West Broadway, Rm 265
Frankfort, KY 40601
Phone: 502-695-0468
Fax: 502-695-1024

Endangered, Threatened, & Candidate Species in _____CASEY_____ County, KY

Group	Species	Common name	Legal* Status	Known** Potential	Special Comments
Mammals	*Myotis sodalis*	Indiana bat	E	P	

NOTES:

* Key to notations: E = Endangered, T = Threatened, C = Candidate, CH = Critical Habitat

**Key to notations: K = Known occurrence record within the county, P = Potential for the species to occur within the county based upon historic range, proximity to known occurrence records, biological, and physiographic characteristics.

Report of
Endangered, Threatened, and Special Concern
Plants, Animals, and Natural Communities
for Casey County, Kentucky

Kentucky State Nature Preserves
Commission
801 Schenkel Lane
Frankfort, KY 40601
(502) 573-2886 (phone)
(502) 573-2355 (fax)

www.naturepreserves.ky.gov

County	Taxonomic Group	Scientific name	Common name	Statuses	Ranks	# of Occurrences E	H	F	X	U
Casey	Vascular Plants	*Lilium superbum*	Turk's Cap Lily	T /	G5 / S1S2	1	0	0	0	0
Casey	Vascular Plants	*Trillium pusillum*	Least Trillium	E / SOMC	G3 / S1	3	0	0	0	0
Casey	Freshwater Mussels	*Epioblasma triquetra*	Snuffbox	E / LE	G3 / S1	0	1	0	0	0
Casey	Freshwater Mussels	*Simpsonaias ambigua*	Salamander Mussel	T / SOMC	G3 / S2S3	1	0	0	0	0
Casey	Freshwater Mussels	*Toxolasma lividus*	Purple Lilliput	E / SOMC	G3 / S1	0	1	0	0	0
Casey	Freshwater Mussels	*Villosa lienosa*	Little Spectaclecase	S /	G5 / S3S4	0	3	0	0	0
Casey	Crustaceans	*Barbicambarus cornutus*	Bottlebrush Crayfish	S /	G4 / S2	0	0	0	0	1
Casey	Insects	*Maccaffertium bednariki*	A Heptagenid Mayfly	S /	G2G4 / S2	1	0	0	0	0
Casey	Insects	*Ophiogomphus mainensis*	Maine Snaketail	E /	G4 / S1	2	0	0	0	0
Casey	Insects	*Stylurus scudderi*	Zebra Clubtail	E /	G4 / S1	0	1	0	0	0
Casey	Fishes	*Percina macrocephala*	Longhead Darter	E / SOMC	G3 / S1	0	2	0	0	0
Casey	Fishes	*Percopsis omiscomaycus*	Trout-perch	S / SOMC	G5 / S3	0	1	0	0	0
Casey	Fishes	*Phenacobius uranops*	Stargazing Minnow	S /	G4 / S2S3	1	1	0	0	0
Casey	Amphibians	*Cryptobranchus alleganiensis alleganiensis*	Eastern Hellbender	E / SOMC	G3G4T3T4 / S1	1	0	0	0	0
Casey	Reptiles	*Pituophis melanoleucus melanoleucus*	Northern Pine Snake	E / SOMC	G4T4 / S2	0	0	0	0	1
Casey	Breeding Birds	*Thryomanes bewickii*	Bewick's Wren	S / SOMC	G5 / S3B	1	0	0	0	0
Casey	Communities	*Siltstone/shale glade*		N /	GNR / S2S3	2	0	0	0	0
Casey County Total:						**13**	**10**	**0**	**0**	**2**

Data current as of April 2013

Species Information

Federal Threatened, Endangered, and Candidate Species observations for selected counties

Linked life history provided courtesy of NatureServe Explorer.

Records may include both recent and historical observations.

US Status Definitions Kentucky Status Definitions

List Federal Threatened, Endangered, and Candidate Species observations in 1 selected county.
Selected county is: Casey.

Scientific Name and Life History	Common Name and Pictures	Class	County	US Status	KY Status	WAP	Reference
Epioblasma triquetra	Snuffbox	Bivalvia	Casey	LE	E	Yes	Reference

1 species are listed

West, Jami B (KYTC-D08)

Cultural Historic - Coorespondence w/ DEA SME

From: Abner, Amanda (KYTC)
Sent: Tuesday, October 08, 2013 4:09 PM
To: West, Jami B (KYTC-D08)
Cc: Adams, Derek (KYTC)
Subject: RE: EBRP 023C00002N Brush Creek Rd - Casey County

I would not worry too much about the house as far away as it is. I have no concerns about the bridge.

-----Original Message-----
From: West, Jami B (KYTC-D08)
Sent: Wednesday, October 02, 2013 11:07 AM
To: Abner, Amanda (KYTC)
Cc: Adams, Derek (KYTC)
Subject: EBRP 023C00002N Brush Creek Rd - Casey County

Amanda,
The bridge on this EBRP project is 44 years old so I didn't consider it for historical significance. However there is an old house that is probably more than 150 feet from the bridge but is in the viewshed technically. You cannot see the house very well because of the trees and the whole property is covered in junk. I missed the house entirely the first time on the project. I saw the trailer and everything else and didn't' even see it. However it's there. Is it something we need to worry about?
Thanks.

Your message is ready to be sent with the following file or link attachments:

House2
House

Note: To protect against computer viruses, e-mail programs may prevent sending or receiving certain types of file attachments. Check your e-mail security settings to determine how attachments are handled.