To: Royalton Town Administrator and Selectboard
From: Ethan Swift, MAP Program Manager, Vermont DEC Watershed Management Division
Date: Monday, July 16, 2018

Subject: Bridge Street bridge site visit

The Watershed Management Division (WSMD) conducted a site visit to the Royalton Bridge site visit on 7/12/2018 in response to reports of a substance dripping on recreationalists (i.e., swimmers and tubers). Site visit was conducted by Rick Levey, an Environmental Scientist with the Watershed Management Division.

Background

Information provided by Royalton Road crew in the 7/11 "Valley News" article states that this bridge was reconstructed in 1982, and that the wooden deck was built with creosote-treated lumber.

- Coal tar creosote is the most widely used product to treat wooden bridges.
- Concerns over preservative "weeping" (migration) have increased over the past 2 decades.
- Leaching and weeping of creosote, especially in hot weather appears to be the priority issue.

Creosote

- Creosote is a complex mixture produced from coal that is made up of more than 250 compounds.
- Polycyclic Aromatic Hydrocarbons (PAHs) can make up to 90% of creosote.

Problem

The Royalton Bridge (Bridge Street) is built off of creosote wooden deck which is "weeping" in hot weather (i.e., typically in excess of 90 degrees) and river users are being exposed to dripping creosote which can pose a health hazard.

Creosote -Acute Health Effects

- Skin contact can cause irritation, burning redness, rash and itching, which is made worse by exposure to sunlight.
- Contact can cause severe eye irritation and burns and may cause loss of vision.

Site visit Observations

- Evidence of significant weeping/dripping on concrete abutments on both sides of bridge.
- Evidence of weeping on underside of bridge wooden deck (between wood).
- Evidence of creosote drippings on "dry" rocks below bridge.
- Evidence of creosote drippings on "dry" sand / substrate below the bridge.

Air Temperature

Temperature during site visit was 82 F, the WSMD investigator did not observe creosote dripping from bridge during visit.
Based on review of reports, it appears that temperature needs to be approximately high 80's to 90 degrees Fahrenheit or above before the bridge creosote begins to weep.

White River- Instream Observations

WSMD investigator used snorkeling gear to examine the "wetted" river substrate above / below and under the bridge.

WSMD investigator looked for evidence of creosote drippings staining river substrate, looked for evidence of oil sheen when substrate was disturbed. In addition, the WSMD investigator

- Did not observe any "wetted" substrate with creosote drippings / stain.
- Did not observe any "oil sheen" when bottom substrate (sand / gravel) was disturbed.
- Did not smell any "petroleum" product at the water surface (creosote from the bridge could be smelled).

Comments on "hot weather" weeping

- There is clear evidence that creosote weeping is occurring at the Royalton Bridge.
- The evidence of recent weeping is consistent with recent reports that some river users have been exposed to creosote drippings at this site during hot weather periods.

Areas of Highest Risk of Exposure

- Underside of bridge during hot weather when creosote is weeping.
- Immediately downstream of bridge, drippings that enter water will float and users can be exposed to the creosote before it breaks up and is carried downstream, dissolving and volatilizing.

Moderate Risk

The river substrate/sediment is at moderate risk from creosote, in shallow/turbulent areas creosote drippings may adhere to substrate and in slow moving areas heavier weight compounds may sink to bottom.

Moderate Risk

- Surface water chemistry immediately downstream of bridge may contain elevated levels of PAHs when the bridge is actively weeping creosote.
- It is not likely that these levels would remain elevated further downstream due to dilution and other factors.

Suggestions

1. **Signage should be installed** at this bridge site informing all users that there is "Risk of Creosote Exposure," especially under the bridge during hot weather periods and immediately downstream of the bridge. **Signage should be apparent** to river users traveling by boat and/or tube.

2. Develop corrective action plan and/or mitigation to prevent "creosote weeping" from entering river corridor and public use area. A variety of mitigation actions could be considered, the degree of which will directly inform the depth of engineering and potential remediation actions.

Note: Vtrans has been contacted (Andy Shively, Hazardous Materials and Waste Coordinator with the Vtrans HazMat Unit – contact: Mobile (802) 229-8740, andy.shively@vermont.gov) and can provide technical assistance (Andy is cc'ed this message).

Monitoring

- The WSMD can provide technical assistance to the town if water quality monitoring should be considered to determine potential effects of the bridge weeping during hot weather (high 80 to

90 degrees Fahrenheit) to further delineate areas of concern and gain further understanding of risk associated from this weeping.

- WMD can assist with water quality monitoring (PAHs) downstream from bridge during "weeping events," to determine if water quality standards are exceeded and delineate the zone of impact if needed.
- The Vermont DEC Watershed Management Division is available to discuss further and assist in developing monitoring plan if desired.

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Photos showing the apparent creosote dripping, and substrate below the bridge with creosote: