SUBJECT:	**Guidance to Mining Impacts related to Crayfishes**
DATE:	**July 12, 2017 REVISED March 28, 2018**
APPROVAL:	**Harold Ward – Director**

Guide to Consideration of Potential Mining-related Impacts on the Guyandotte River and Big Sandy River Crayfishes

The following information shall serve as guidance regarding consideration of the Federally Endangered Guyandotte River crayfish, *Cambarus veteranus*, and the Federally Threatened Big Sandy River crayfish, *Cambarus callianus*, to potential impacts wrought by mining activities. The information includes an initial key to determine which protective measures, if any, are needed in consideration of/mitigation for an action. Also, an adaptive management plan designed to prevent and mitigate for any impacts from sedimentation emanating from the action. These processes, along with the existing permit provisions designed to protect all wildlife, are considered sufficient to protect aquatic species, including Federal T&E species. As such, the WVDEP/DMR anticipates no impacts to the species if these and all permit provisions are adhered to.

INITIAL KEY TO CONSIDERATION OF IMPACTS TO T&E CRAYFISHES

1.) Does the proposed action occur within a HUC-10 watershed of known occurrence for or within the described range of the threatened or endangered (T&E) crayfish species?

- Yes---------go to step 2
- No----------no further action needed

2.) Does the proposed action immediately impact a 3rd order stream segment or larger within a known occurrence HUC-10 watershed or does the proposed action impact a tributary to a 3rd order stream segment.

- Yes--------go to step 3
- No---------provide standard benthic/habitat/water quality data required to assess the impacts of the proposed action, provide results for baseline analyses, no further action needed [1]

[1] Rather than proceeding through the remaining steps, applicants may choose to assume presence and develop a PEP (Step 5). Similarly, applicants may choose to skip habitat assessments (Step 3) and proceed directly to presence/absence surveys (Step 4) or to developing a PEP (Step 5).

3.) Conduct physical habitat assessment to determine the potential for crayfish colonization. Based upon the results of the survey, was potential habitat for the species present in the impacted stream segment?

- Yes, potential habitat present----------go to step 4
- No, potential habitat not present---------provide habitat survey results including photo documentation, no further action needed

4.) Conduct presence/absence survey for the T&E crayfish species via WVDNR/USFWS approved crayfish surveyor. Were T&E crayfish species located in the surveyed stream segment?

- Yes, T&E crayfish species present ---------go to step 5
- No, T&E crayfish species not present------provide survey results, no further action needed

5.) Complete a protection and enhancement plan (PEP) and Incidental Take statement for the identified T&E crayfish species and include documentation within section H-4 of the permit. Also, include a consultation closure letter from the US Fish and Wildlife Service.

WATER QUALITY PROTECTIVE MEASURES NEEDED FOR T & E CRAYFISHES

As part of the permit conditions associated with the proposed action, all applicable water quality standards are expected to be met, both for human health and the health of aquatic life, including endangered species. These criteria include numeric criteria established to protect aquatic life from all known toxicants and stressors as well as narrative criteria designed to evaluate aquatic life from a community perspective that incorporates all short-term and long-term stressors in a waterbody. The downstream reaches affected by this action are expected to maintain water quality standards (as compared to baseline conditions) and are not expected to be deleteriously impacted by the proposed action. However, as a precaution to the potential impacts from deposited sediment on the crayfish species' habitat emanating from the proposed action, an adaptive management plan will be employed.

ADAPTIVE MANAGEMENT PLAN FOR THE IMPACTS OF SEDIMENTATION EMANATING FROM MINING ACTIONS IMPACTING FEDERALLY THREATENED AND ENDANGERED CRAYFISHES

The following guidance will be used to monitor and mitigate for any extraneous impacts from sedimentation emanating from the proposed action.

At the first three (3) 300-meter stream segments, continuous or interrupted by tributary, downstream of the action or discharge, sediment monitoring stations will be established and periodically inspected. In the absence of an annual high precipitation event, the sediment monitoring stations will be monitored monthly using the standard USEPA Rapid Bioassessment Protocol measures of

sediment deposition and embeddedness applied throughout the reach. The sediment monitoring stations will be monitored following each annual high precipitation event. The results of each monitoring event will be compared to the initial evaluation for the location and, if a significant decline in the scoring is detected, mitigative actions will be performed to restore potential habitat within that stream reach. A significant decline in the sediment evaluations will be considered with a 5-point reduction in the scoring for either of the evaluation measures or when a narrative category declines for both measures (e.g., both sediment deposition and embeddedness decline from "optimum" conditions to "suboptimum").

Mitigation for potential habitat lost due to the impacts from sedimentation emanation from the proposed action shall include restoration of the habitat feature described as the most limiting factor affecting the occurrence of these crayfishes—slab boulders. At a rate of one hundred (100) slab boulder structures per 300-meter station, the stream reaches impacted will be augmented with the lacking habitat. These structures, along with natural features, will be surveyed for occupancy, as the monitoring of these reaches for continued impacts from sedimentation persists throughout the duration of the permit. It is not expected that sedimentation from a permitted action should displace any species, including crayfish, as the annual monitoring of benthic invertebrates associated with the action is designed to detect such impacts.