

Scope of Services

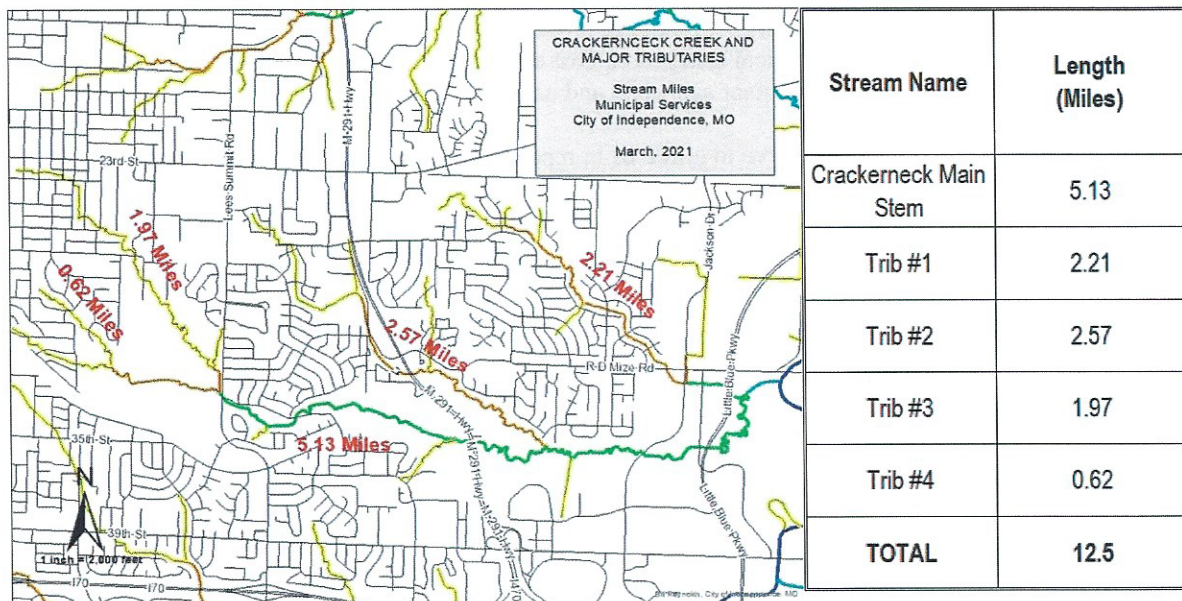
Crackerneck Watershed Geomorphology Study

Phase 1 PES

Independence, MO

The Crackerneck Creek watershed includes approximately 4,700 acres of Independence, Missouri; a large suburb of Kansas City. The watershed is generally bound by 23rd street/Mo-78 to the north, Noland Rd. to the west, 39th St. to the south and the Little Blue River to the east (Figure 1). The watershed contains commercial properties, housing, and a complex road network. Unlike the other urbanized streams in Independence, the Crackerneck watershed is experiencing unusually high levels of erosion which is currently threatening infrastructure including sewer lines which could result in significant water quality issues.

This scope of services describes the items and tasks required for completion of engineering analyses and stream bank stabilization recommendations on the Crackerneck watershed in Independence, Missouri. The study area includes the stream reaches shown in Figure 1.



The key components of the project scope are as follows:

1. PROJECT MANAGEMENT

This task includes coordination meetings with staff and applicable agencies.

- 1.1 Hold kick-off meeting with City staff to develop project goals, vision, objectives and criteria at the outset of the project. Facilitate coordination meetings throughout the project with Public Works and other appropriate City staff. Provide regular written status updates via email to the Client at least monthly. Present findings at a City staff meeting.

2. DATA COLLECTION, BASE MAPPING & REVIEW

- 2.1 Collect, compile and evaluate available City and County watershed data including but not limited to the following:

- Historical aerial photography available through USDA, Independence and Jackson County
 - Prior citizen complaint logs and known problem locations
 - Available bridge and culvert as-builts and/or inspection records
 - City GIS data: contours, streams, aerial images, sanitary sewers, utilities
 - Planned City storm drainage, roadway, and sanitary sewer improvement projects
 - Soils data
 - Existing and proposed FEMA floodway and floodplain
- 2.2 Compile all the above data into a GIS project base map that is fully compatible with the City's established geographic information system (GIS).

3. GEOMORPHIC ASSESSMENT & FIELD INVESTIGATIONS

- 3.1 A comparison of present channel alignment with older aerial photos will be performed. The interpretation of aerial photography will involve tracing stream thalwegs visible in aerial photographs available, then evaluating how the land uses and associated channel conditions have changed over time. Stream tracing shape files for key time intervals will be mapped and evaluated.
- 3.2 Based on initial aerial mapping analysis, identify critical stream migration areas impacting homes, property and infrastructure, and further project if the stream will continue to migrate at an aggressive rate or if it is diminishing or halted. Identified areas will be evaluated in greater detail in the field investigations.
- 3.3 Perform field geomorphic analysis and inventory of the channel, encompassing roughly 12.5 miles of stream. Critical areas identified in Task 3.2 will receive particular attention, but the full length of stream will be investigated for additional potential problem areas. A field assessment form will be utilized to log results. Assessments will focus on those areas where assets are threatened. The field investigations will include:
- a) Assessment of bank material composition and erodibility by observations of vegetation cover, bank angle, stratigraphy, and lithology of bank deposits or materials will be conducted.
 - b) Assess and determine the stream dynamics causing channel instability – progressing head-cuts, down-cutting, meander migration, overall widening, etc.
 - c) Visual geotechnical evaluations will be performed in potential bank stabilization locations to determine weak soil zones, unstable channel bank slopes, and evaluate the overall geologic profile of the project areas.
- 3.4 Place assessment findings information on GIS basemap indicating location of significant incised or unstable channel banks, head-cuts, and threatened property and infrastructure. Populate database with findings from the field investigations, problem locations and problem severity.
- 3.6 Prepare narrative to describe the findings and recommendations of the assessments conducted in this task. Review with City staff and modify as needed prior to subsequent tasks.
- 3.7 For each identified stormwater problem area, develop conceptual improvements that address the specific problems identified in the geomorphic assessments and protect the impacted assets. Solutions will be with attention to several factors including effectiveness, cost, environmental impacts including regulatory limitations and potential mitigation measures, aesthetics, utility impacts, overlap with other City projects, private property impacts, and land/easement acquisition. Solution options will be reviewed with City staff as needed throughout this effort. A maximum of ten (10) project areas is included with this Scope of Work.