In-Stream Remediation of Coal Tar-Impacted Sediments and Fractured Bedrock

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Background/Objectives. Parsons was retained as the construction manager of a MGP-site remediation in Upstate New York. A portion of the site included remediating a section of an urban stream adjacent to a major structural wall. The objective was to remove the previously delineated coal tar impacted sediments and restore the stream grades, including restoration of the vegetated banks.

Approach/Activities. A temporary dam was constructed and the stream flow was bypassed by pumping to allow for "in-the"dry" removals. As the sediments were being removed, it was discovered that the extent of the coal tar impacts was significantly greater than delineated in the Remedial Investigation documents. In addition, it was also discovered that the upper limestone bedrock was heavily fractured and was also severely impacted with coal tar NAPL flowing from numerous joints and bedding plane fractures. Initially, the heavily fractured bedrock was removed down to a competent, low fracture frequency limestone bed in the downstream section of the remediation area. As the fractured layer thickened, Parsons observed that the competent layer had a smooth surface with a constant dip back to the edge of the stream adjacent to the owner's site.

Parsons designed an in-stream containment system to prevent recontamination of the sediments and surface water from migration of the coal tar from the underlying and surrounding bedrock as well as coal tar impacted soils in the banks. This provided protection of the stream without additional bedrock removal. The containment system included passive collection trenches, including one in the fractured bedrock, to collect NAPL which follows the dip of the competent bedrock surface back to the owner's site where the NAPL can then be collected in a sump. The detailing was developed with the contractor's input to better match the equipment, materials, and staff available on the site.

Results/Lessons Learned. Delineation of NAPL, especially in fractured bedrock, requires a focused effort during the remedial investigation. Minor geological details can play a major role in determining an efficient and effective solution. In this case, the identification of a competent bedrock layer with a constant dip greatly simplified the development of an effective containment system. Much more attention needs to be paid to logging soil and bedrock structure in remedial investigations. Addressing the discoveries of the extent of coal tar impacts during construction required immediate responses due to the complexities of doing unanticipated removals at the foundation level of a major structural wall.