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**MEMO**

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From:  
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Date:  
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ARCADIS Project No.:  
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Subject:  
Superior, Wisconsin Site

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This memorandum summarizes the results of the hydrologic analysis performed for Crawford Creek, as proposed under Task 4 of our September 15, 2008 Purchase Order Request for Engineering Support Activities (the PO Request) related to the Koppers Inc. Superior, Wisconsin Facility.

The purpose of this hydrologic analysis was to determine peak stream flows (i.e., peak discharges) for Crawford Creek for the 2-, 10-, 25-, and 100-year storm events for later use in evaluating the potential hydraulic impacts (changes in flow conditions, flooding potential, etc.) that could result from realigning the stream. Figure 1 (attached) shows the watershed boundary that was used for this analysis. Peak discharges were calculated at the railroad crossing, located at the downstream (northern) extent of the project site, using regionalized flood-frequency regression equations developed by the United States Geologic Survey (USGS). These regional regression equations are provided in a report published by the USGS in 2003, titled *Flood-Frequency Characteristics of Wisconsin Streams (Water-Resources Investigations Report 03-4250)*. This report can be viewed online at <http://pubs.usgs.gov/wri/wri034250/>. The following table summarizes the results of the hydrologic analysis; detailed calculations can be provided upon request:

Storm Event	Peak Discharge (cfs)
2-year	388
10-year	888
25-year	1,155
100-year	1,547

cfs = cubic feet per second

This information will be used, along with other hydraulic and topographic information related to existing and proposed channel conditions, in performing the hydraulic analyses outlined under Task 5 of the PO Request. The hydraulic analyses will also include an evaluation of changes in flood storage capacity associated with the modified floodplain areas.

Please contact me at 518.452.7826, ext. 11 if you have any questions.

Attachment: Figure 1. Crawford Creek Watershed Map

Figure 1. Crawford Creek Watershed Map

