

Mike Schmoller Project Manager Wisconsin Department of Natural Resources South Central Region 3911 Fish Hatchery Rd Fitchburg WI 53711

Subject:

Site Investigation Work Plan Addendum, Madison-Kipp Corporation, 201 Waubesa Street, Madison, Wisconsin. Facility ID No. 113125320, BRRTS No. 02-13-001569

Dear Mr. Schmoller:

On behalf of Madison-Kipp Corporation, a Site Investigation Work Plan was submitted to the Wisconsin Department of Natural Resources (WDNR) on May 31, 2012 for approval to complete site investigation activities. The WDNR provided a *Conditional Approval* letter dated June 25, 2012 for this Work Plan. The conditional approval was granted with the understanding that the on-site investigation activities completed at Monitoring Wells MW-3D3 and MW-5D3 would be evaluated and the data used to confirm the recommended locations, depths, and construction of future wells. The data from Monitoring Wells MW-3D3 and MW-5D3 was evaluated and presented at a technical meeting with the WDNR on August 23, 2012. This Site Investigation Work Plan Addendum (Addendum) has been prepared to document the new well details as discussed during the August 23 meeting.

## **Investigation Work Plan Addendum**

The following sections present a description of the work to be completed as part of the Site Investigation Work Plan Addendum.

### **Proposed Well Locations**

Five additional wells will be installed to further evaluate the horizontal and vertical extents of groundwater impacts on-site and off-site (Figure 1). The following is an overview of locations that were agreed to at the August 23 meeting.

• One well will be located at the west entrance to the Madison-Kipp parking lot located on the west side of Waubesa Street.

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#### ENVIRONMENT

Date: September 13, 2012

Contact: Jennine Trask

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Our ref: WI001283.0007

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- One well will be located in the Madison-Kipp north parking lot between Monitoring Well MW-1 and the Monitoring Well MW-3 well nest.
- One well will be nested with the Monitoring Well MW-6S/D well nest located in the Madison-Kipp southeast parking lot.
- One well will be located at the intersection of Fairview Street and Dixon Street.
- One well will be nested with the Monitoring Well MW9D/D2 well nest located in the right-of-way of Saint Paul Avenue.

It should be noted that the proposed well locations depicted on Figure 1 are approximate and may need to be modified in the field based on impediments such as underground and aboveground utilities and parkway vegetation.

## **Drilling and Sampling**

Below is a summary of the proposed drilling, well installation, and groundwater sampling activities.

### Soil and Rock Drilling

The boreholes will be advanced using hollow stem auger drilling in the unconsolidated soils and mud rotary drilling in the bedrock. Below is a summary of the soil and rock sampling methodology.

Soil samples will be collected at 2-foot intervals using split spoons from the top of the water table to the top of bedrock. The soils will be field screened for the presence of volatile compounds and the characteristics will be logged. Once bedrock is encountered, a 6-inch permanent casing will be set approximately 5 feet into competent bedrock. The bedrock will be blind drilled using mud rotary drilling methods.

### Vertical Aquifer Profiling

Vertical aquifer profiling will be completed at each proposed borehole location using a "top-down" sampling approach. Groundwater samples will be collected as the borehole is advanced using a single or double packer. This "top-down" sampling approach limits vertical migration and in-hole mixing of groundwater. Vertical aquifer profiling is a method used to determine the vertical extent of groundwater impacts by

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sampling discrete intervals. The purpose of the packer system is to limit the flow of groundwater from above and below the desired sampling interval, so that a discrete interval of the borehole may be tested. Packer tests provide a means of assessing the hydraulic yield of the test zone, and of collecting groundwater samples for laboratory analysis. After pumping water from the sample interval to remove the effects of the drilling activities, a water sample will be collected from the interval.

Groundwater samples will be collected every other 10-foot interval from the base of the permanent casing (estimated 40 feet below land surface [ft bls]) to 200 ft bls and submitted to TestAmerica for laboratory analysis of volatile organic compounds (VOCs). The exceptions to this plan are the proposed wells nested with MW-9D/D2 and MW-6S/D. Groundwater samples at the Monitoring Well MW-6S/D and MW-9D/D2 well nests will begin at 80 ft bls, which is 10 feet below the deepest currently installed screen at each well nest.

The groundwater samples will be placed in laboratory-supplied containers. The containers will be placed in a cooler with ice for transport to the analytical laboratory. Groundwater samples will be submitted for analysis of VOCs by Method 8260B for expedited (3 working day) turnaround time. The groundwater analytical data will be used to aid in selecting which locations are converted to single screen wells or multiport sampling systems, and to determine what depths will be sampled.

## **Geophysical Logging**

Down-hole geophysical logging will be completed at these locations up to approximately 200 feet. Multiple geophysical logging tools will be utilized including gamma, fluid temperature, fluid resistivity, caliper, heat-plus flowmeter, and high resolution acoustic and optical borehole televiewers. The purpose of geophysical logging is to determine the locations and thickness of formations and fractures and identify the less and more permeable water-bearing zones where contaminant flow exists. The groundwater analytical results and geophysical logs will aid in determining where the contaminant mass resides in the groundwater and where the predominant groundwater flow in the fractures is present.

Borehole Development and Temporary Blank Liner Installation

Each borehole will be developed to produce water free of sediment, drill cuttings and drilling fluids. Well development forms (WDNR Form 4400-113B) will be completed for each of borehole. After development, FLUTe blank liners will be temporarily

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installed in the boreholes to limit vertical migration and in-hole mixing until all five boreholes have been advanced and sampled.

#### Well Installation

After the five boreholes are advanced, sampled, and logged using geophysical methods, the groundwater analytical and draft geophysical data will be evaluated. Recommendations for the borehole locations to be converted to single screen or multiport well, and where screens or sampling ports will be installed, will be provided to the WDNR.

Based upon the WDNR-approved screen and sample port locations, wells will be installed in the boreholes. The single screen wells will be constructed and developed in accordance with NR141 Wis. Adm. Code. A 5-foot, 0.010-inch, stainless steel screen and Schedule 80 polyvinyl chloride riser will be used. However, a 10-foot stainless steel screen may be installed if multiple fractures are identified. The multiport systems will be installed using Schlumberger Westbay Systems, which consist of hydraulically-inflated permanent packers connected to modular casing and valved port couplings to allow for monitoring pressure (converted to groundwater elevation) and collection of groundwater samples. The wells will be completed at the surface with a flushmount well compartment set in concrete.

#### Hydraulic Conductivity Testing

In-situ hydraulic conductivity testing will be completed at new well locations where a single screen is installed. The testing will be completed using a pneumatic test method. The purpose of hydraulic conductivity testing is to measure the ability of the rock to transmit water when subjected to a change in hydraulic gradient. The testing will also provide a means to evaluate whether existing wells are screened in low or high transmissivity portions of the aquifer (e.g., whether bedrock wells screen fractured or unfractured intervals of rock). These data will help to interpret results from those wells both in terms of plume delineation and future remedial performance.

#### Water Levels and Groundwater Sampling

Initially, a single round of groundwater samples will be collected from the new and existing monitoring wells. The water level in each well will be measured using a decontaminated electronic water level meter in the wells with single screens and a pressure transducer in the wells where multiport systems were installed.

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Groundwater samples will be collected using low-flow sampling techniques from wells with single screens. Groundwater grab samples will be collected from no-purge discrete sampling ports where multiport systems were installed. Low-flow sampling techniques consist of purging the groundwater at a low-flow rate until a set of field parameters stabilize. Low-flow sampling techniques are used to collect representative water samples in the formation adjacent to the well screen while 1) reducing water turbulence which may unnecessarily volatilize contaminants; 2) reducing turbidity levels that may bias analytical results high, and 3) reducing the volume of water requiring management. Multiport systems do not require purging since water is not stored in well casing, but instead retrieved directly from the formation. Thus, the data from the multiport systems provide comparable water quality to wells sampled using low-flow sampling techniques.

Groundwater samples will be submitted for laboratory analysis of VOCs, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, and dissolved Resource Conservation Recovery Act metals from on-site wells and VOCs from off-site wells for standard (10 working day) turnaround time. On-site wells will include Monitoring Wells MW-1, MW-2S, MW-2D, MW-3S, MW-3D, MW-3D2, MW-3D3, MW-4S, MW-4D, MW-4D2, MW-5S, MW-5D, MW-5D2, MW-5D3, MW-6S, MW-6D, the well proposed to be nested with MW6S/D, and the well proposed in the north parking lot. Off-site wells will include Monitoring Wells MW-1, MW-12S, and two proposed wells located in the west parking lot and at the intersection of Fairview Street and Dixon Street.

All containers and preservatives will be obtained directly from the analytical laboratories. Immediately after collection, the sample containers will be placed in a cooler with ice until shipment to the appropriate laboratory can be arranged. Standard chain-of-custody procedures will be followed throughout sample collection, storage, and shipment.

#### Surveying

A Wisconsin-licensed surveyor will locate the horizontal location to Wisconsin state plane coordinates and vertical elevation for each boring location. The bulk of the contaminant mass identified previously at Monitoring Wells MW-3D3 and MW-5D3 was confirmed to a maximum depth of 160 ft bls. It was agreed upon at the technical meeting with the WDNR to complete vertical aquifer profiling to 200 feet in order to sample below the location with the potential highest contaminant mass. Due to topographic changes in the area, the locations and elevations of each borehole will be surveyed to confirm each location is drilled to an elevation located between 667

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feet (200 ft bls at MW-3D3) and 672 feet (200 ft bls at MW-5D3) above mean sea level. The horizontal locations and vertical elevations of the proposed wells will be surveyed again after installation.

#### **Investigative-Derived Waste**

Soil and rock cuttings generated during the soil boring advancement will be containerized in appropriate roll-off containers. Water generated during boring advancement, sampling activities, and wash water generated during the cleaning of down-hole equipment will be containerized in an aboveground storage tank. Arrangements will be made with a licensed disposal facility for the transportation and disposal of the non-hazardous waste.

### Reporting

A Site Investigation Report will be prepared that documents the facility and release history, geologic and hydrogeologic conditions, nature and extent of contamination, potential receptors and transport mechanisms, the results of the bedrock characterization completed in June and July 2012, the scope of work detailed in the Addendum, and recommendations (as warranted).

### Schedule

The schedule for the scope of work detailed in this Addendum will be determined based on availability of the multiple subcontractors and suppliers, and weather conditions. ARCADIS anticipates the work will begin in September 2012.

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## Closing

If you have any questions regarding this letter, please contact me at (414) 276-7742.

Sincerely,

ARCADIS U.S., Inc.

Joni L. Schoer

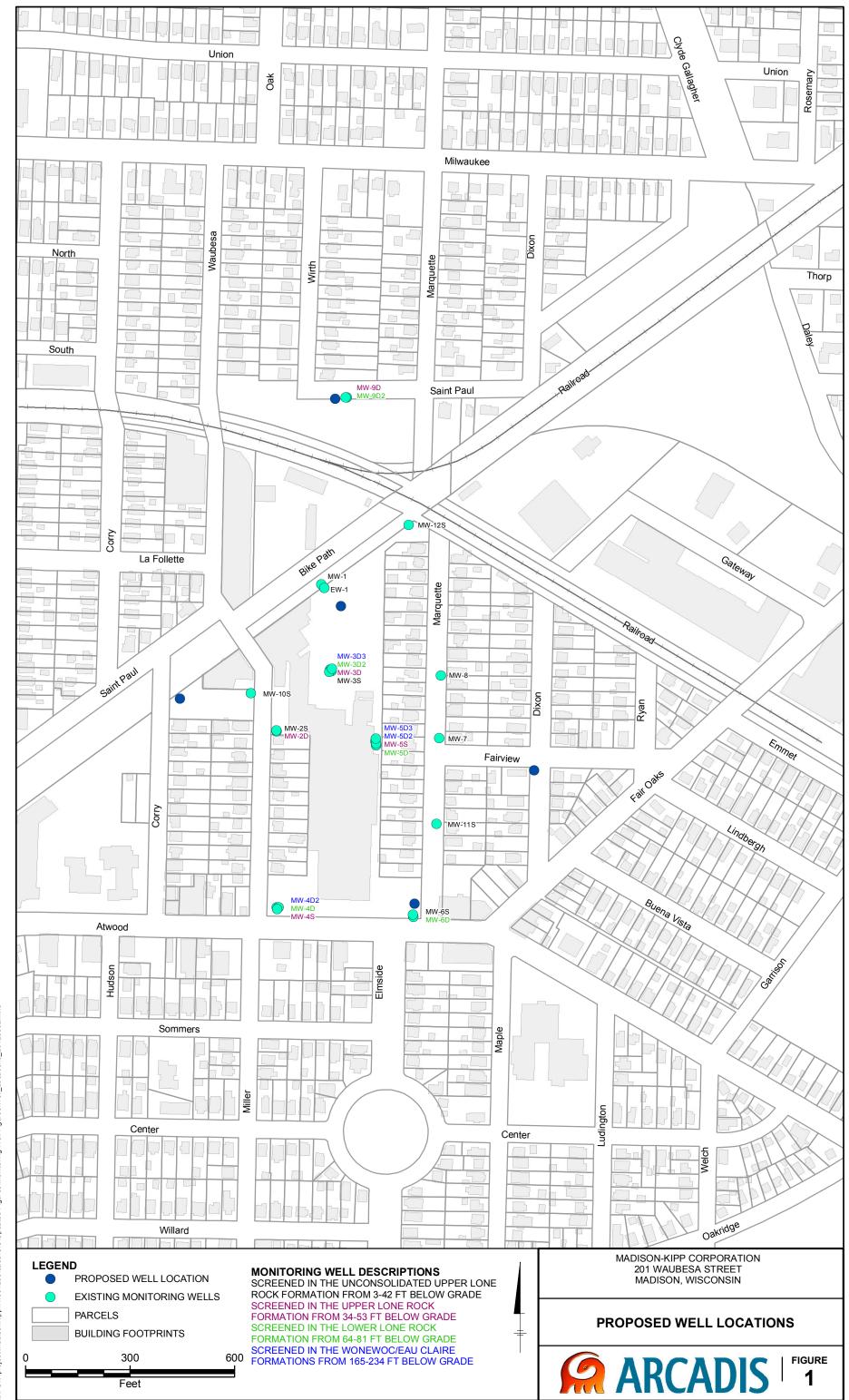
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