

DATE: July 20, 2016

TO: Katie Crawley, Deputy Mayor for Public Works and Communication, City of Madison

FROM: Linda Hanefeld, South Central Region Remediation and Redevelopment Team Supervisor

SUBJECT: Responses to Citizens' Questions Regarding Clean-up at the Madison Kipp Corporation Site

On May 18, 2016, you shared with me a list of questions the SASY Neighborhood Association asked about various aspects of the investigation and clean-up at the Madison Kipp Corporation (MKC) facility located at 201 Waubesa Street, Madison. These questions were transmitted to you via electronic mail by Katherine Domina, a legislative aide to Representative Chris Taylor. The DNR and the city of Madison Water Utility have provided the answers in this memo.

Question 1 -- [PCBs in the soil, MKC Grounds, Bike Path and Rain Garden Areas](#)

Recent excavation of the bike path and rain garden area is encouraging but has raised concerns that PCB levels above allowed standards may still be present near the Goodman Center's compost and garden areas and downstream from the rain garden. Very high levels of PCBs remain below the MKC parking lot and building. Please explain the science and methodology you have used to conclude that the off site cleanup and remaining onsite contamination is acceptable.

DNR Response

- *Contaminated soil cleanup standards and their applicability are described in [Wis. Admin. Code § NR 720](#). The Department of Natural Resources (DNR) relies on soil residual contaminant levels (RCLs) following the U.S. Environmental Protection Agency (EPA) procedures to be protective of human health.*
- *RCLs are determined by following EPA procedures that use exposure assumptions such as the amount of time a person may spend on a property each day, the weight of an individual, toxicity of the chemical of concern, how a person might become exposed to the chemical(s), etc. [DNR publication RR-890](#) describes how to use EPA's RCL web calculator.*
- *DNR compares site data acquired through soil sampling and analysis with the soil RCLs to determine whether a cleanup is protective of human health given the current use of the property.*
- *DNR may also allow people responsible for cleanups to use methods like clean soil covers or impervious pavement (e.g., a parking lot, an asphalt path) to keep people from coming into direct contact with the contaminants of concern. These caps and covers also help minimize the amount of rain and melting snow flowing through contaminated soil and moving contaminants closer to groundwater.*
- *The Madison Kipp Corporation (MKC) removed 3,820 tons of PCB-contaminated soil (on- and off-site combined) between 2012 and 2016. DNR, the city of Madison (City) and MKC analyzed soil-sampling data to determine what soil needed to be excavated and properly disposed.*

- All accessible soil that contained polychlorinated biphenylsⁱ (PCBs) in excess of .74 milligrams per kilogram (mg/kg) was removed from the grassed-in section of the bike path. The .74 mg/kg concentration is the RCL selected for the bike path, consistent with the application of RCLs described in [DNR publication RR-890](#). With the exception of a single sampling location, all PCB-contaminated soil beneath the MKC parking lot in excess of 50 mg/kg was also removed.
- The RCL (soil cleanup goal) of less than 50 mg/kg for soil beneath the MKC parking lot is consistent with DNR rules, EPA requirements identified in the Code of Federal Regulations, 40 C.F.R. § 761.61, and the DNR/EPA agreement on the cleanup of PCB-contaminated soil in Wisconsin. See “PCB Remediation in Wisconsin under the One Cleanup Program Memorandum of Agreement” guidance, November 2014, [DNR publication RR-786](#).
- EPA, DNR and MKC are currently considering a proposal to allow PCB-contaminated soil to remain in place under the MKC building as an interim measure until the soil becomes more accessible and can be more easily removed as a final remedial action.
- Sampling data indicated the soil contamination beneath the building should not impact groundwater. However, continued groundwater sampling and analysis is required by EPA and DNR to ensure the PCB-contamination is not migrating into groundwater. If sampling shows the contamination is moving then immediate removal of the contaminated soil underneath the building will be necessary.
- There does not appear to be an overland flow path that would transport contaminants from the MKC parking lot to the Goodman Community Center compost pile or rain garden. Soil samples collected northeast of the rain garden did not contain PCB-levels that exceeded the RCL (and clean-up goal) of .74mg/kg.
- All soil in the project area that exceeded the RCL at the time of lab analysis, and remains in place, is capped/covered by clean soil or a solid layer of asphalt. A cap/cover maintenance plan is in place and DNR requires MKC to comply with the conditions of this maintenance plan to ensure it remains protective.
- A detailed description of the soil condition in the bike path and rain garden area is included in the case closure request submitted by MKC and received by DNR on April 28, 2016. This request has been reviewed by DNR and the City. A copy of the case file, reports and the closure determination for the rain garden and bike path area are available at <http://dnr.wi.gov/botw/GetActivityDetail.do?adn=0213562649&siteId=564900&crumb=1&search=b>

Question 2 -- [PCE in Well 8](#)

The City water utility may decide to draw from Well 8 year-round by constructing a facility to house Iron and Manganese filters under the assurance that the PCE contaminated water will not be drawn toward the well. If after constructing this facility the City finds water contaminated by the PCE plume is drawn to it by the 24/7 withdrawals, in spite of assurances to the contrary, what remedial measures does the City have in place? Has the City conducted cost-benefit analysis on this scenario and if so, what are its conclusions? If the City is confident that the pollution will not reach Well 8, please provide supporting geologic and scientific data regarding this conclusion, given that fractures do exist in the bedrock of this area and it is not as impermeable as once thought.

City of Madison Water Utility Response

- *Madison Water Utility relies on Well 8 as a seasonal well to meet supply and fire protection needs on the East Side during high-demand summer months. While MWU may eventually need to use the well year-round, it is unclear whether the increased pumping will affect a nearby plume of groundwater containing PCE. An iron and manganese filter for the well is currently budgeted for completion in 2026, but more analysis must be done before that filtration system can be constructed.*
- *In 2014, Madison Water Utility hired an independent environmental consultant to review the conclusions of modeling work performed by Madison Kipp's consultant, Arcadis (Evaluation of Plume Stability and Fate and Transport Modeling for PCE in Bedrock Groundwater). Our consultant's review identified some shortcomings of the study and opportunities for further investigation. A second consultant is currently under contract with the City to expand on the work of the initial review and analysis. The objectives of this work include:*
 - *Evaluate the stability of the PCE plume utilizing groundwater data collected since the first consultant completed her report. Determine if the plume is advancing, retreating, or has stabilized.*
 - *Identify gaps (three-dimensional) in the current monitoring. Recommend additional groundwater monitoring locations and screen intervals.*
 - *Refine the existing subsurface conceptual model for the area. Re-evaluate the hydrogeological units and calibration points used by Arcadis in their fracture flow model. Re-run fracture flow model if necessary.*
 - *Work with Wisconsin Geological and Natural History Survey (WGNHS) staff to identify potential effects of various pumping scenarios at Unit Well #8 on the local groundwater flow system using the new regional aquifer groundwater model.*
 - *Identify possible locations and vertical coverage for a groundwater "Sentinel Well" system. This system would identify migrating contaminants before they reach Well #8.*
 - *Documents related to these investigations can be found on the Madison Water Utility's website: <https://www.cityofmadison.com/water/water-quality/whats-next-for-well-8>*
- *As part of the city's Capital Budget process, Madison Water Utility develops a multi-year capital improvement plan, which is re-evaluated annually to account for changing water use patterns and fiscal constraints. The East Side Water Supply plan, completed in 2012, confirmed that the city will eventually need to use Well 8 year-round in order to meet demand on the East Side. Reconstruction of the well would be more economical than locating, drilling and developing a completely new well site in that part of the city.*
- *With the reconstruction of Well 7 on Sherman Avenue now complete, combined with other financial constraints, the utility has been able to delay the Well 8 project. Madison Water Utility's 2017 Capital Improvement Plan, approved by the Water Utility Board and submitted to the Mayor for*

inclusion in his executive budget, identifies 2026 as the completion year for this project. The proposed plan also includes a groundwater study in 2017 and installation of sentinel wells in 2018 to further examine groundwater movement in the area. Reconstruction of Well 8 would initially include iron-manganese filtration but could also be expanded to include PCE removal.

- *Water quality will be monitored in the sentinel wells once they are constructed. If PCE is detected moving toward the well and is rising to unacceptable levels, a future treatment system to remove PCE or other volatile organic compounds would be added. Along the way, there will be multiple decision points and opportunities for community feedback to be incorporated into the planning process.*
- *In the meantime, Well 8 will continue to operate on a seasonal basis. The plan for summer 2016, and in future years, is to operate the well for about four hours daily between mid-July and mid-September. During this time, the well will deliver about 400,000 gallons of water per day and 20 million gallons per season. More water may be pumped during emergency conditions – large fire or equipment failure at another well – or extreme drought.*

Question 3 -- PCE Near Surface Water and Vapor Intrusion

Many homes near MKC were tested for the presence of PCEs and fitted with sub-slab vapor removal systems which pull out the vapors and release them near the homes' rooflines, as in radon control systems. Others have never been tested and do not have vapor removal systems installed. Those residents are concerned their exposure to PCE vapor is being overlooked. In addition, the Goodman Center and Madison Brassworks have never been tested for the presence of PCEs. Please provide data supporting your conclusion that such limited data collection is conclusive and that no more testing or vapor system installations are justified.

DNR response

- *DNR tested 47 MKC-area houses in 2012 to determine if tetrachloroethyleneⁱⁱ (PCE) soil contamination was releasing gases/vapors that were migrating into houses and buildings. Based upon 2012 guidance criteria, none of the houses tested required the installation of vapor mitigation systems.*
- *A 2012 DNR report titled, "[Review of Vapor Sampling Results for the Neighborhood Surrounding the Madison Kipp Corporation](#)," indicates that all 47 homes tested were below the 2012 PCE indoor air and sub-slab vapor health-based screening levels. Information about vapor sampling is available at <http://dnr.wi.gov/botw/GetActivityDetail.do?adn=0213558625&siteId=564900&crumb=1&search=b> as well as on the DNR's MKC web page: <http://dnr.wi.gov/topic/Brownfields/kipp.html>.*
- *The 2012 report concluded that "[t]he extent of PCE vapor intrusion health risk to residents in homes near the MKC property has been defined. The current data indicate that the health risk from vapor intrusion in the neighborhood due to PCE contamination of soil and shallow groundwater from MKC property has been quantified and addressed through installation of sub-slab depressurization systems" (i.e., mitigation systems) at a few homes immediately adjacent to the MKC property.*

- *Regarding the Goodman Center - Based on the data collected for the 2012 DNR vapor study and report, DNR concluded the extent of any potential vapor plume associated with contamination from the MKC property had been determined; it did not extend beyond a few properties immediately adjacent to the MKC property and no further vapor sampling was necessary. DNR determined that PCE soil gas vapors from the MKC property would not reach the Goodman Center property.*
- *Investigations performed at the Goodman Center indicate there is not a source of chlorinated contamination on the Goodman property. It is the DNR's professional opinion, based upon the data available, that there is insufficient chlorinated contamination present to lead to a vapor intrusion concern at the Goodman Center. Reports documenting the types of contaminants found at the Goodman Center can be viewed at:
<http://dnr.wi.gov/botw/GetActivityDetail.do?siteId=630300&adn=0213552584>*
- *Regarding the Madison Brass Works property, the city of Madison conducted a vapor assessment here in 2014 using EPA grant funds and determined that vapor intrusion into the building was not an issue or concern. The Phase I and II environmental assessment information can be viewed at <http://dnr.wi.gov/botw/GetActivityDetail.do?siteId=3803800&adn=0313001683>*

Question 4 -- Groundwater Extraction/Treatment System/Stormwater Discharging PCEs and Other Chemicals

MKC's groundwater extraction system (GETS) is currently pumping about 64,000 gallons of contaminated groundwater from beneath its site each day and discharging it through City storm sewers into Starkweather Creek. Although the GETS discharge is treated to remove some of the contamination, this water may still contain PCE, TCE, chloride, peroxide, permanganate and other chemicals at levels orders of magnitude higher than groundwater standards.

For some time MKC injected potassium permanganate into this groundwater to try to break down the PCEs in place. This permanganate was observed as a pink color in the discharge when MKC had to run the effluent above ground last fall while the storm sewer was being replaced, so MKC added a treatment step using hydrogen peroxide to break down the permanganate, which is highly toxic to aquatic life, before release. The only "test" to assure this permanganate is completely removed is a monthly visual inspection for the "pinkness" of the discharge. In any case, high levels of manganese may still be present in the discharges.

The DNR and City permits for this GETS system include requirements for MKC to sample, test and monitor the discharged water, but not for all possible chemical pollutants. PCEs and their breakdown products are tested monthly, but many possible chemicals, including PCBs, permanganate, manganese and chlorides are not monitored in the discharge at all. Chlorides are becoming one of the most concerning chemicals in our lakes and groundwater, and some of the contaminants are toxic to aquatic life. What goes into surface water can end up eventually in groundwater, and manganese is already a problem in Well 8, not far from where Starkweather Creek discharges into Lake Monona. Furthermore, the frequency of testing (monthly grab samples) cannot assure we really know what is being pumped into the creek and lake.

Why isn't the DNR or City requiring that all harmful chemicals in the GETS effluent be properly tested to assure the health of Starkweather Creek, Lake Monona and groundwater?

MKC's contribution to the phosphorus, dissolved solids, and other contaminant problems in the lakes should be investigated. Kipp has never monitored how much phosphorus, dissolved solids, chlorides, PCBs, metals or other toxic contaminants, are coming from their stormwater runoff and going via storm drains into Starkweather Creek and Lake Monona, which are on the "impaired waters" lists for TSS, phosphorus, and metals. As of August 2015, chloride was also added to the impaired listing for Starkweather Creek. Kipp has self-reported since 1994 (even while contaminants were being documented all over the site) that there are NO contaminants coming out of its storm pipes at all. DNR and the city have trusted MKC self-reports and have not required Kipp to test storm water discharges for these contaminants.

What will the long term effects of these ongoing discharges of contamination into Starkweather Creek, Lake Monona, and groundwater--particularly Well 8 and Well 11--be? These issues should be investigated, addressed and discussed with the east side and broader community.

DNR Response

- *MKC requested regulatory coverage under the "Wisconsin Pollution Discharge Elimination System (WPDES) Contaminated Groundwater from Remedial Action Operations" general permit; the DNR reviewed the application and determined the proposed discharge qualified for coverage under the general permit. The application materials did not indicate any realistic potential to exceed surface water quality standards listed in ch. NR 105, Wis. Adm. Code, for pollutants not directly limited by this general permit.*
- *PCB groundwater contamination was very minor and only present in the initial sampling events from well nest MW-22S&D; subsequent sample results all showed no-detections of PCBs. It is believed PCBs have not migrated to groundwater but rather were associated with the sediment present in the groundwater sample collected from those monitoring wells. MW-22S&D are also located outside the capture zone of the groundwater extraction well.*
- *The presence of elevated manganese in the groundwater is not considered to be from the MKC. Manganese concentrations are commonly found in groundwater aquifers of Wisconsin, and its presence occurs naturally from soils and certain types of rock. The groundwater in this aquifer is in contact with manganese-containing solid materials, dissolving them, and releasing the naturally-occurring manganese into the groundwater. Chapter NR 105, Wis. Adm. Code, Tables 1 through 9, do not identify a surface water quality discharge limit criteria for manganese. Based on the EPA toxicity database, the DNR derived a secondary criterion for manganese. The average groundwater concentrations from the monitoring wells tested in capture zone did not identify a surface water discharge concern.*
- *Sodium permanganate is a commonly used soil and groundwater remediation injection agent for chlorinated compounds and was used in the previous remediation efforts for MKC. After startup of the groundwater extraction system, the system extracted some of the residual sodium permanganate (approximately 0.75 - 3.8 milligrams per liter or mg/L concentration) remaining from the initial remediation efforts. Chapter NR 105, Wis. Adm. Code, Tables 1 through 9, do not identify a surface water quality discharge limit for permanganate. However, the DNR has required that MKC neutralize the permanganate as part of the treatment process. The neutralization process is being monitored and adjusted by visual observation and the results are submitted with the Discharge Monitoring Reports to determine compliance.*

- *The DNR added the supplemental monitoring requirement for chloride, which is likely present in groundwater due to its use as a deicing agent for roads during winter. The sample results collected to date are below levels that would require the need for treatment and the issuance of a specific WPDES permit.*

Question 5 -- [Air Pollution](#)

When DNR issued air pollution permits to Kipp, the public hearings at East High School, Olbrich Gardens and DNR's offices were well-attended with residents anxious to express their concerns. Neighborhood residents repeatedly asked for better regulation of Kipp's air pollution. Kipp has gradually made improvements including better building ventilation in the mid-1990's, increasing the height of the furnace stacks to 100 feet and recently announcing that chlorine will no longer be used for purifying melted aluminum. While air pollution control equipment is available to eliminate the furnace and die casting emissions, Kipp continues to release uncontrolled air pollution into the neighborhood.

Very few tests have been conducted to measure Kipp's air pollution emissions. The last compliance test on the stacks exhausting the die casting fumes were conducted in 1994. At public hearings and written comments, residents have repeatedly asked the DNR to require more tests to determine amount and composition of Kipp's air pollution emissions. Evidence suggests that Kipp has discharged cancer-causing chemicals from its vents and stacks. We already know from tests that the injection of chlorine into the molten aluminum created stack emissions of the carcinogenic dioxins and furans. There has never been an analysis of the chemical composition of the die casting fumes. The Die Casting Association and USEPA acknowledge that die casting fumes contain toxic chemicals. The neighborhood's expert for the recent solvent contamination lawsuit, Dr. Everett, noted that the soil beneath Kipp wall vents was contaminated with PAH compounds and Kipp's die casting operations released PAH compounds through vents and stacks. Sampling inside Kipp last year found PCB's in the workplace air.

Neighborhood residents and Representative Taylor have repeatedly asked for tests on the Kipp die casting operations to determine the amount and composition of the fumes released into the neighborhood. When will the DNR require Kipp to test the die casting fumes?

How will new DNR air pollution regulations and policies affect the control of Kipp emissions? Examples include the policy on evaluating if fine particles comply with air quality standards, higher emission thresholds for generic registration permits, and non-renewable operation permits.

Will Kipp voluntarily agree to comply with current air quality standards, conduct stacks tests on its die casting operations, and install air quality monitors?

Could the DNR or health department identify all of the chemicals which Kipp releases as air pollution into the neighborhood?

DNR Response

- *Based on the compliance inspection performed by the DNR in 2013, the facility was found to be operating in compliance with all Wisconsin air pollution control regulations. The full compliance*

evaluation report is available for review at the DNR regional office at 3911 Fish Hatchery Road in Fitchburg, or at the agency headquarters at 101 S. Webster Street in downtown Madison. Current air quality monitoring data shows that citizens in Madison are breathing air that is in compliance with all national ambient air quality standards.

- *To the extent required by the Wisconsin Administrative Code, the company has reported all their emissions to DNR. The emissions from the company, and their current operation permit, 113125320-F10, can be found by using the permit search tool.*
- *Previous permits set emission limits for the die casting operations based on stack test data. The removal of chlorine for purifying melted aluminum eliminates the emissions from that process. Also, air quality trends for fine particulate matter in Dane County continue to improve, as shown on our website.*
- *Madison Kipp may choose to apply for coverage of a registration permit or may retain their current synthetic minor status. The air program is in a position to need to focus on renewals for the largest emitters of air pollution while the renewal permit application for Madison Kipp is for a lower emitting synthetic minor source. Any future permit review conducted by the program will follow the current policies. The various policies and permit options in the Air Management Program, including Registration Permits, are explained here, where a Type B Registration Permit Fact Sheet, Application Guidebook, Application Form, and the air pollution control registration permit itself, dated February 23, 2016 can be found.*
- *MKC was asked to monitor indoor air for exposures to PCBs. It is the DNR's understanding that EPA's concerns regarding worker exposure issues have been satisfied.*

Question 6 -- Public Information

In 2011, the DNR set up a website and listserv to help neighbors and others keep abreast of the MKC contamination issues and clean-up efforts. DNR and Madison/Dane Co Public Health held two public meetings (in October 2011 and February 2012) and two "availability sessions" (March and May 2015) and allowed people to ask questions and get updates. No public meetings have been held since then. DNR placed updates on their website and sent them out to the listserv from October 2011 to October 2014, and placed the last public information document (regarding the GETS system permit) on this website in January 2015. Although DNR has put some technical documents on their BRRTS website since then, not many people are aware of this resource.

MKC has responded to questions a few times on the SASY Neighborhood Association Facebook page and listserv and met once with the SASYNA Kipp Committee, as well as attending the public availability sessions.

How can the DNR, MKC and other agencies assure that the public has complete, updated information on MKC's contamination issues and clean-up efforts?

DNR Response

- *Area residents and other citizens can directly access all DNR's environmental information related to soil investigation and cleanup activities at MKC here:*
<http://dnr.wi.gov/botw/GetActivityDetail.do?adn=0213576860&siteId=564900&crumb=1&search=b>.
- *The 3 DNR case file tracking numbers for the MKC activities discussed in this document are: a) 02-13-576860, which pertains to soil remediation work both on- and off-site; b) 02-13-558625, which pertains to the facility itself, including PCB and groundwater work); and c) 02-13-562649, which pertains to the investigation of the rain garden and bike path.*
- *In addition, information and documents related to other MKC cleanup project activities can be viewed by searching for "Madison Kipp" in the "Activity Name" box on this web page:*
<http://dnr.wi.gov/botw>.
- *The above web-based DNR database, known as BRRTS on the Web, contains information about all known discharges of hazardous substances to soil and groundwater in Wisconsin. It also includes data and, in some instances, documents for environmental assessment, investigation and remediation activities.*
- *Anyone having trouble accessing information via the web-based database, and anyone without internet access, is welcome to contact DNR and make an open records request for the information they wish to review. Call DNR's Open Records Coordinator at 608-266-2177.*
- *The DNR has made a commitment to make new documents received from Madison Kipp or its consultant, Arcadis, available on DNR's Bureau for Remediation and Redevelopment Tracking System database (BRRTS on the Web or BOTW) that is accessible to the public at:*
<http://dnr.wi.gov/botw/SetUpBasicSearchForm.do>
- *DNR's Madison Kipp Webpage, with historic information and documents about the environmental cleanup, is located at <http://dnr.wi.gov/topic/brownfields/kipp.html>.*
- *All records are available for viewing at the DNR office in Fitchburg by appointment. Please contact Wendy Weihemuller at 608-275-3212 or at wendy.weihemuller@wisconsin.gov to set up an appointment. Or, you can make an open records request by completing the form found at:*
<http://dnr.wi.gov/contact/csopenrecords.html>

ⁱ PCBs are a group of 209 different compounds. PCBs are manufactured substances and have no smell. They are yellow, oily liquids that don't burn easily. There are no natural sources of PCBs. Companies in the United States first made PCBs in 1929. They've been used as coolants in electrical equipment, in metal-cutting oils, in microscope lens oils, and in inks, dyes, and carbonless copy paper. Source: <https://www.dhs.wisconsin.gov/chemical/pcb.htm>.

ⁱⁱ Tetrachloroethylene (PCE) is a nonflammable, liquid solvent widely used in dry cleaning, wood processing, fabric manufacturing, and metal degreasing. In homes, it may be found in suede protectors, paint removers, furniture stripper, water repellents, silicone lubricants, spot removers, glues, and wood cleaners. PCE evaporates slowly at room temperature and has a sweet, ether-like odor. When PCE is improperly disposed of or spilled, most of it will evaporate into the air. The rest will seep into the soil. It may mix with groundwater and contaminate water supplies. Source: <https://www.dhs.wisconsin.gov/chemical/tetchlor.htm>