March 6, 2023

Ms. Jennifer Meyer
Wisconsin Department of Natural Resources
Southeast Region Office
Remediation and Redevelopment Program
1027 W. St. Paul Avenue
Milwaukee, WI 53233

Project # 40383B

Subject: **Emerging Contaminants Evaluation**
School Sisters of Notre Dame Redevelopment Project
13105 Watertown Plank Road, Village of Elm Grove, Wisconsin
BRRTS #: 02-68-589720, FID: 268020280

Dear Ms. Meyer:

K. Singh & Associates, Inc. (KSingh) has prepared this Emerging Contaminants Evaluation letter on behalf of Caroline Heights Apartments, LLC for documentation purposes for the Wisconsin Department of Natural Resources (WDNR).

Caroline Heights Apartments, LLC is proposing to perform historic rehabilitation of Notre Dame and Maria Halls and construct 35 apartments within those structures. The other buildings on the property will be razed and the property redeveloped with 202 new luxury, market-rate apartments, for a total of 237 apartments. A total of 21 single family homes will be developed on the eastern portion of the property along Red Barn land and the southern portion of the property near Green Meadow Lane. The western portion of the property will be preserved as a cemetery.

Prior soil and groundwater investigation results are documented within these three reports as reference:

- Phase II Environmental Site Assessment (KSingh, April 22, 2022),
- Site Investigation Work Plan (KSingh, July 11, 2022), and
- Site Investigation Report (KSingh. August 31, 2022).

Considering the sites past history of the site being used as a commissary since the late 1800s the potential for emerging contaminants is highly unlikely. In addition, a table from Intrastate Technology Regulatory Council (ITRC) website (Table 1) was used to compare industry and applications against the subject site and no Per- and Polyfluorinated Substances (PFAS) uses were noted. It is KSingh's opinion that emerging contaminants are not a concern at the subject site.

Please contact us if you have any questions.

Sincerely,

K. SINGH & ASSOCIATES, INC.

Daniel K. Pelczar, CPG, P.G.
Senior Geologist

Robert T. Reineke, P.E.
Project Manager

Pratap N. Singh, Ph.D., P.E.
Principal Engineer

cc: Mr. Phillip Aiello / Caroline Heights Apartments, LLC (via Mandel Development)

Table 1 - Site Evaluation of Historic and Current Uses of PFAS

TABLE 1

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Site Evaluation of Historic and Current Uses of PFAS

Evaluation of PFAs Based on ITRC Table 2-4 (https://pfas-1.itrcweb.org/2-5-pfas-uses/)

Industry / Application	PFAs Type	Documented Use and Examples of Some PFAs	Site Evaluation
Aviation and Aerospace	Polymer	Mechanical components made of fluoropolymers (such as PTFE and PFA tubing, piping, seals, gaskets, cables, and insulators)	No aviation or aerospace activities performed at site or in immediate vicinity.
	Nonpolymers	Hydraulic fluid additives made from PFSA salts (such as PFOS at about 0.1%) to prevent evaporation, fires, and corrosion	
Automotive	Polymer	Mechanical components made of fluoropolymers, including wiring and cable, fuel delivery tubing, seals, bearings, gaskets and lubricants, and some polymer coatings on carpets	No automotive parts manufacturing performed on site or in immediate vicinity.
	Nonpolymers	Surface treatment for textiles, upholsteries, carpets, leather and exterior surfaces	
Biocides (Herbicides and Pesticides)	Polymer	None reported	No biocides used or manufactured on site or in immediate vicinity
	Nonpolymers	Active ingredients such as short-chain sulfonamides in plant growth regulators and herbicides, and EtFOSA (sulfluramid) in ant and termite baits; inert enhancing ingredients in pesticides; PFPAs and PFPiAs as anti-foaming agents in solutions	
Building and Construction	Polymer	Fluoropolymer membranes and coatings (such as PTFE, PVDF, and/or side-chain fluorinated polymers) in architectural materials (like fabrics, roofing membranes, metals, stone, tiles, concrete, radomes); adhesives, seals, caulks; additives in paints (for example, low- and no-VOC latex paints), varnishes, dyes, stains, sealants; surface treatment agent and laminates for conserving landmarks	No building or construction manufacturing performed on site or in immediate vicinity.
	Nonpolymers	Additives in paints, coatings, and surface treatments (PASF- and fluorotelomer-based compounds, ammonium salt of PFHxA)	
Cable and Wiring	Polymer	Coatings and jacketings made of fluoropolymers (such as PTFE and PVDF) for weathering, flame, and soil resistance, with cables used in many applications, including communication facilities, antennae, and computer networks	No cable or wiring manufacturing performed on site or in immediate vicinity.
	Nonpolymers	None reported	
Cosmetics/Personal Care Products	Polymer	Dental floss and micro powders used in creams and lotions.	No cosmetics or personal care products manufacturing performed on site or in immediate
	Nonpolymers	Cosmetics, shampoos, nail polish, eye makeup, denture cleaners	
Electronics	Polymer	Fluoropolymers (such as PVDF and PTFE) used in insulators, solder sleeves, printed circuit boards, cell phones, computers, speakers, and transducers	No electronics manufacturing performed on site or immediate vicinity.
	Nonpolymers	Flame retardants for polycarbonate resin (such as the potassium salt of PFBS)	
Energy	Polymer	Fluoropolymer films (such as FEP, PVDF) to cover solar panel collectors, electrolyte fuel cells, PTFE expansion joint materials for power plants	No manufacturing related to energy production performed on site or immediate vicinity.
	Nonpolymers	Fuel cell and battery electrolyte (such as the lithium salt of PFAAs)	
Firefighting/Safety	Polymer	Fluoropolymers used in firefighting equipment and protective clothing (such as those woven with PTFE). Other polymer coatings using side-chain fluorinated polymers)	No fire fighting foams used or manufactured on site or immediate vicinity.
	Nonpolymers	Coatings and materials used as water repellents and some Class B foam (may contain PFCAs, PFSAs, and fluorotelomer-based derivatives), vapor suppression for flammable liquids (for example, gasoline storage)	
Food Processing	Polymer	Fluoropolymer fabrication materials (such as PTFE) (liners for trays, ovens, grills)	No food processing performed on site or in immediate vicinity.
	Nonpolymers	May be used as coatings on food packaging	
Household Products	Polymer	Nonstick coatings (fluoropolymers such as PTFE); aftermarket treatment for textiles, upholsteries, carpets, and leather (such as FT-based side-chain fluorinated polymers)	No household products manufactured on site or in immediate vicinity.
	Nonpolymers	Aftermarket treatment for textiles, upholsteries, carpets, and leather (such as PASFs; floor polishes (such as the ammonium salt of PFDA), coatings, and floor finishes (PFPAs and PFPiAs) and cleaning agents and alkaline cleaners; automobile waxes; may include PFAAs, PASF- and fluorotelomer-based derivatives	
Medical Products	Polymer	Fluoropolymers used in surgical patches, cardiovascular grafts, raw materials for human body implants (such as catheters, stents, needles, and other) given biocompatibility and extremely low coefficient of friction	No medical products manufactured on site or in \immediate vicinity.
	Nonpolymers	X-ray film, stain- and water-repellent protective medical fabrics (like surgical drapes and gowns) created from PASF- or fluorotelomer-based (meth)acrylate polymers and polyurethanes	
Metal Plating	Polymer	None reported	Metal metal plating work not performed on site or in immediate vicinity.
	Nonpolymers	Wetting agent, mist suppression for harmful vapors, and surfactants (may include potassium, lithium, diethanolamine and ammonium salts of PFOS or 6:2 FTS)	
Oil Production	Polymer	Lining of gas pipes	No oil production manufacturing or related work performed on site or immediate vicinity.
	Nonpolymers	Marketed for and potential instances of use in oil well production	
Mining	Polymer	None reported	No mining or related manufacturing performed on site.
	Nonpolymers	Instances of surfactants used in ore mining flotation	
Paper and Packaging	Polymer	Oil and grease and water repellent to paper, paperboard, molded pulp products (including food contact materials), and LDPE bags; examples include side-chain fluorinated polymers in which the PASF- or fluorotelomer-based alcohols or their acrylate or methacrylate esters are attached on side chains	No manufacturing involving PFAs containing paper and packaging performed on site or immediate vicinity.
	Nonpolymers	Phosphate ester salts (esterification of PASF or FT-based alcohols with phosphoric acid; PFPEs	
PFAS Production	Polymer	Not applicable	No PFAs manufactured on site or immediate vicinity.
	Nonpolymers	Emulsion polymerization processing aids for fluoropolymers (such as PTFE, FEP, PFA, PVDF), (co)monomer of side-chain fluorinated polymers; (co)monomer of fluoropolymers and to make fluoroelastomers; may use salts of long-chain PFCAs (such as PFOA and PFNA), salts of short-chain PFCAs (such as PFHxA), or PFECAs	
Photolithography & Semiconductor	Polymer	Equipment raw materials (such as PFA) for molded wafer baskets to handle corrosive liquids and gases, use as fluids in mechanical vacuum pumps	No semiconductor manufacturing performed on site or in immediate vicinity.
	Nonpolymers	Photolithography (such as using PFOS) in manufacture of semiconductor chips	
Textiles (Upholstery, Carpets), Leather, and Apparel	Polymer	Fluoropolymers (such as PTFE) are used in the construction of outdoor gear, clothing, and housewares; side-chain fluorinated polymers (such as PASF- or fluorotelomer-based (meth)acrylate polymers and -polyurethanes) may be used in oil- and water-repellent and stain release finishing and treatment coatings	No textile manufacturing performed on site or in immediate vicinity.
	Nonpolymers	PFOA-based chromium treatment for paper and leather. Nonpolymer coatings used to treat textiles to provide oil- and water- repellent and stain release finishes	
Other	Polymer or Nonpolymers	Scrap Yards, Neighboring Sites, Suspicious Fill	Not a scrap yard or landfill. No neighboring sites with reported PFAs or in immediate vicinity .