
Hinkson Science Team Meeting Minutes

A meeting of the Hinkson Creek Science Team occurred on January 6, 2026, starting at 3:00 PM via Microsoft Teams call.

Science Team Members

Name	Organization	Area of Interest or Role	Present/Absent for Meeting
Dane Boring	U.S. Environmental Protection Agency	Water Chemistry/Water Quality/ CWA Section 303d	Present
Paul Blanchard	Retired	Hydrology/ Water Quality	Present
Robert Voss	Missouri Department of Natural Resources	Water Chemistry/Water Quality/CWA Section 303d	Present
John Holmes	Allstate Consultants	Civil/Environmental/Water Resources Engineer	Present
Robb Jacobson	University of Missouri Columbia, Adjunct Professor	Potamologist	Present
Dave Michaelson	Missouri Department of Natural Resources	Aquatic Macroinvertebrate Biologist/ Water Quality	Present
Chris Schmitt	Retired/Emeritus U.S. Geological Survey	Aquatic Toxicology	Present
VACANT	VACANT	Modeling/BMP related?	VACANT
Alba Argerich	University of Missouri Columbia	Water Quality/Stream Ecology	Absent

Other People in Attendance: Michele Woolbright, Lynne Hooper, Nicki Rineheart, Cody Luebbering, Dave Alvarez, Ted Haeussler

Minutes

The minutes for July 2025 were approved. No meetings were held in August, September, October, November, or December.

Discussion Items

1. USGS Monitoring Presentation and Discussion
 - a. Dave Alvarez with USGS CERC provided an overview and summary of the Hinkson Sampling project, see highlights below.
2. Open Topics
 - a. DNR Macroinvertebrate study planned for Fall of 2025/Spring of 2026

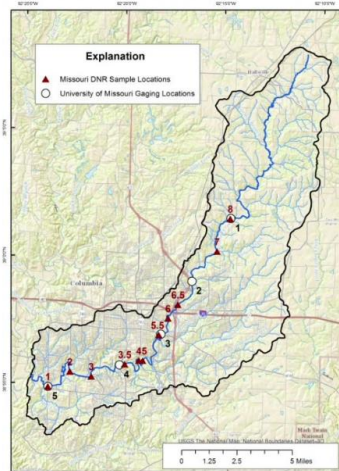
Why do an extensive chemical assessment in Hinkson Creek?

In 1998, listed as impaired for not supporting the “protection of aquatic life” as specified in Missouri’s Water Quality Standards.

In 2001/2002, DNR confirmed the aquatic community was impaired between I-70 and downstream of Broadway.

Toxicity tests indicated some stormwater discharges were toxic to test organisms, implicated chemicals included PAHs and petroleum compounds, pesticides and metals

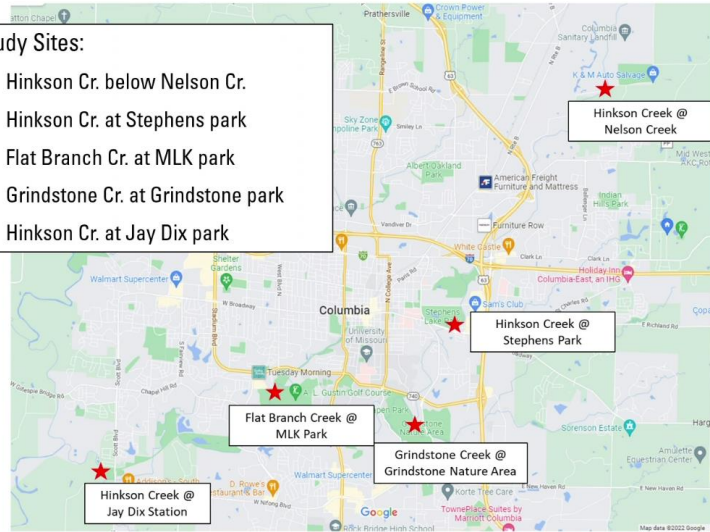
Problem is pollutants included in past assessments do not provide a broad look beyond regulated contaminants.



Site Selection

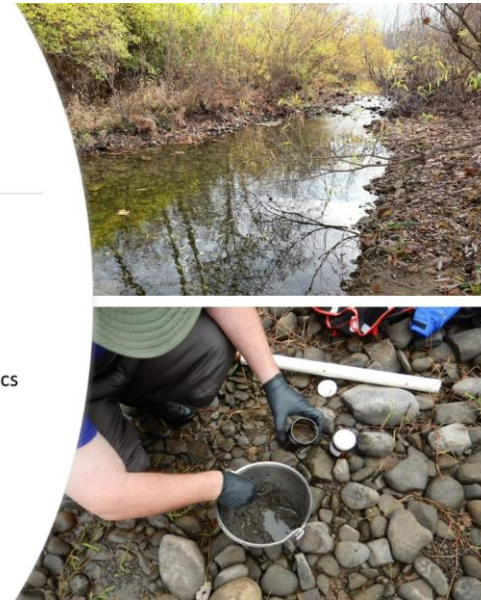
Study Sites:

- Hinkson Cr. below Nelson Cr.
- Hinkson Cr. at Stephens park
- Flat Branch Cr. at MLK park
- Grindstone Cr. at Grindstone park
- Hinkson Cr. at Jay Dix park



Sampling Approach

- Spring: 4/26/22 – 6/3/22
- Fall: 11/3/22 – 12/7/22
- Surface Water
 - Discrete/Grab – inorganics
 - Passive – organics
- Sediment Pore Water
- Sediments



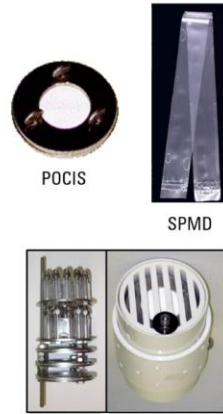
Passive Samples for Organic Chemicals

Provide a time-weighted average concentration of chemicals over periods of weeks to months

Potentially allows the measurement of lower concentrations than possible by other methods

Mimic potential exposure of aquatic organisms

- Semipermeable Membrane Device (SPMD)
 - Lipid soluble chemicals
 - Triolein (lipid) filled polyethylene (LDPE) tube
- Polar Organic Chemical Integrative Sampler (POCIS)
 - Water soluble chemicals
 - Solid phase sorbent held between filter membranes



Targeted Chemical Groups for Analysis

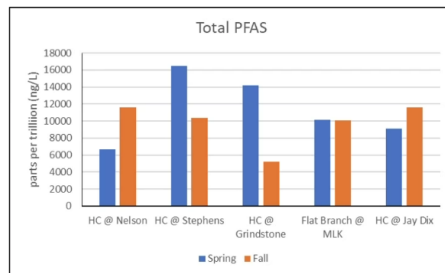
Surface Water ~522 analytes	Pore Water 34 analytes	Sediments ~310 analytes
<ul style="list-style-type: none"> • Petroleum (PAHs) • Legacy Pesticides • PCBs (total) • Fire Retardants • Wastewater Indicators • Pharmaceuticals • Current-Use Pesticides • PFAS • Metals • Cations /Anions • General Water Quality 	<ul style="list-style-type: none"> • Metals • Cations /Anions • General Water Quality 	<ul style="list-style-type: none"> • Petroleum (PAHs) • Legacy Pesticides • PCBs (total) • Fire Retardants (PBDEs) • Wastewater Indicators • PFAS • Metals • Sediment characteristics



PFAS in Water

Total PFAS (sum of 19) is elevated at all sites, but below EPA's acute toxicity benchmarks (not established for mixtures)

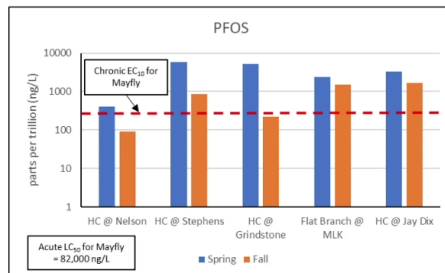
- Acute: 0.071 mg/L (71,000 ng/L) for PFOS
- Chronic: 0.00025 mg/L (250 ng/L) for PFOS



PFOS concentrations

- Greater than chronic effects concentrations for mayfly
- Less than acute lethal concentrations for mayfly

Effects conc: Soucek 2023 ES&T Letters



Wastewater Indicators in Water

Overall, few wastewater indicators were measured above background.

Alternative phosphate-based flame retardants were the most frequently detected.

Chemicals related to wood preservatives identified at several sites.

Overall, Flat Branch Creek @ MLK had the highest concentrations and number of detections followed by Hinkson Creek @ Jay Dix

Concentrations were slightly higher in Spring versus Fall, especially for herbicides.



Preliminary Information-Subject to Revision. Not for Citation or Distribution.

Pharmaceuticals in Surface Water

Overall, few pharmaceuticals (111 human-use drugs targeted) were detected.

Carbamazepine: anticonvulsant, neuropathy, bipolar disorder

Fexofenadine: antihistamine (Allegra)

Lidocaine: local anesthetic

Metoprolol: beta-blocker for high blood pressure

Sulfamethoxazole: antibiotic (Bactrim)

Cotinine: metabolite of nicotine

Concentrations were generally similar with the Stephens Park and Jay Dix sites slightly greater than other sites.

Concentrations were slightly higher in Spring versus Fall, except for sulfamethoxazole.

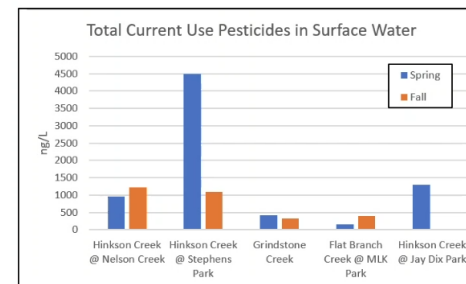
Current-Use Pesticides in Surface Water

Overall, 51 out of 82 pesticides targeted were detected.

- Herbicides 2,4-D, Atrazine, Metolachlor measured at highest concentrations
- Several metabolites of these also detected
- There were more detections in the Spring (199 vs 150) and total concentrations were more than double in the Spring (7300 vs 3030 ng/L)

2 sites had slightly elevated concentrations in the Fall

- Nelson Cr largely due to herbicide degradation products
- Flat Branch Cr partially due to increased fungicide use



Organics in Sediments

PAHs

- Total PAHs at Flat Branch Creek at MLK 6-10X greater than any other site
- MLK site exceeded threshold effect concentrations (*MacDonald 2000 Arch. Environ. Contam. Toxicol.*)

PCBs, Chlorinated Pesticides, PBDE flame retardants

- Overall, very low in sediment samples
- Likely well below any toxicological relevant concentrations

Metals in Sediments and Pore Waters

Sediments

- Concentrations generally less than threshold effect concentrations (TECs) (*MacDonald 2000 Arch. Environ. Contam. Toxicol.*)
- Hinkson Creek @ Nelson Cr and Flat Branch Creek @ MLK had concentrations of As, Ni and Zn near or slightly above TECs

Pore Waters

- Copper, Nickel, Zinc, and Barium most frequently detected
- Concentrations appear to be below EPA aquatic life criteria levels

Total N, P, pH, and DO in Surface and Pore Waters

Surface Water

- Total N: generally <1 mg/L (max of 1.64 mg/L at Hinkson Cr. @ Nelson Cr.)
- Total P: <0.05 mg/L in Spring, up to 0.08 mg/L in Fall (Hinkson Cr. @ Nelson Cr.)
- pH: 7.25-7.98 (no difference between seasons)
- DO: 8.94-10.06 mg/L (Spring only) – all above min. EPA recommended levels

Pore Waters

- Total N: generally <1 mg/L (max of 1.86 mg/L at Hinkson Cr. @ Stephens)
 - Total P: 0.058 to 0.113 mg/L (no difference between seasons)
 - pH: 7.37-7.85 (no difference between seasons)
 - DO: not measured
-