District Digest

Second Edition, Fall 2024/Winter 2025

Updates on Cleanup in Tri-State Mining District Watersheds

Welcome to the District Digest – Watersheds Edition

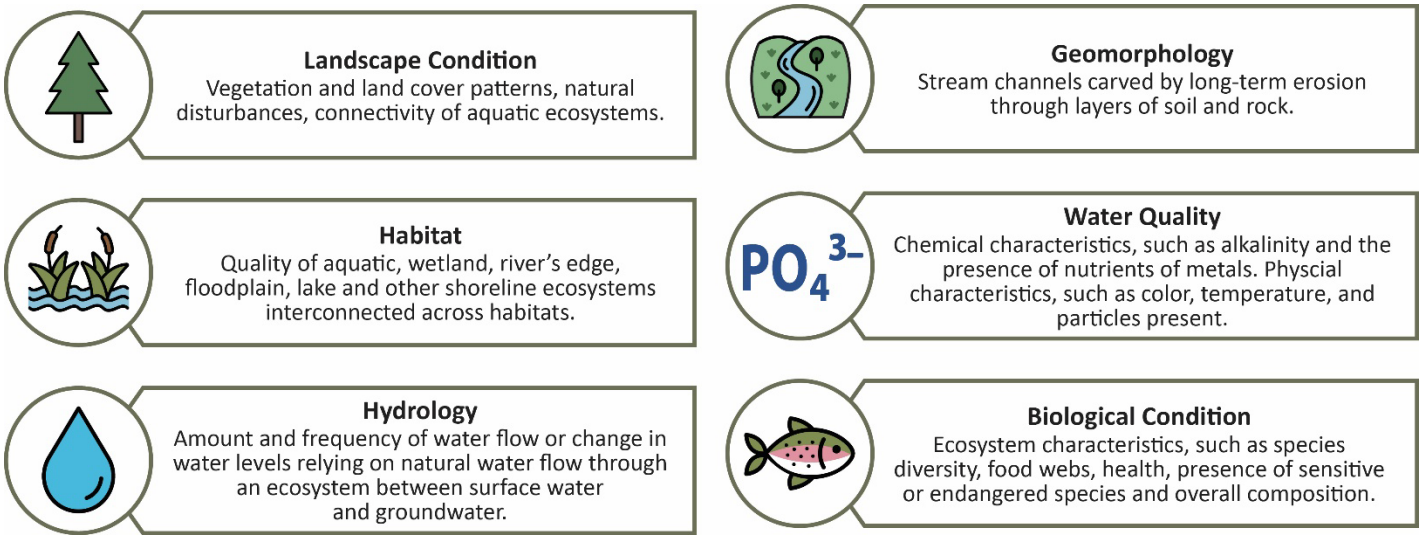
This second edition of the **District Digest** provides information and updates about cleanup activities in the Tri-State Mining District (TSMD) watersheds. The U.S. Environmental Protection Agency (EPA) plans to publish the digest twice a year to share site information, announcements, and ways to get involved in activities across EPA's Regions 6 and 7 TSMD National Priorities List (NPL) Superfund sites located in Kansas, Missouri, and Oklahoma. Please sign up to receive the digest by email or a hard copy via mail. (If by mail, please include a physical mailing address.)

- Contact Elizabeth Kramer, EPA Region 7, at r7-tsmd@epa.gov or 1-800-223-0425.
- Find it online at: www.epa.gov/mo/missouri-cleanups and www.epa.gov/ks/kansas-cleanups.

District Digest Highlights

What Is a Watershed?

A watershed is defined as an area where precipitation, such as rain and snow, is collected and drains into a common outlet, such as a river or creek. A watershed may include large, year-round, flowing streams that are referred to as *perennial,* or streams that have periodic flow or flow only during rain events referred to as *intermittent* and *ephemeral*. The foundation of a healthy watershed relies upon the review of landscape condition, habitat, hydrology, geomorphology, water quality, and biological condition.



The Tri-State Mining District Watersheds

The Spring River, Neosho River, and Lost Creek watersheds collectively make up the TSMD watersheds. Portions of the TSMD watersheds are contaminated with lead, zinc, and cadmium due to historic mining. Mine wastes, such as chat and tailings, have spread through surface water and sediment within the watersheds and can impact vulnerable populations.

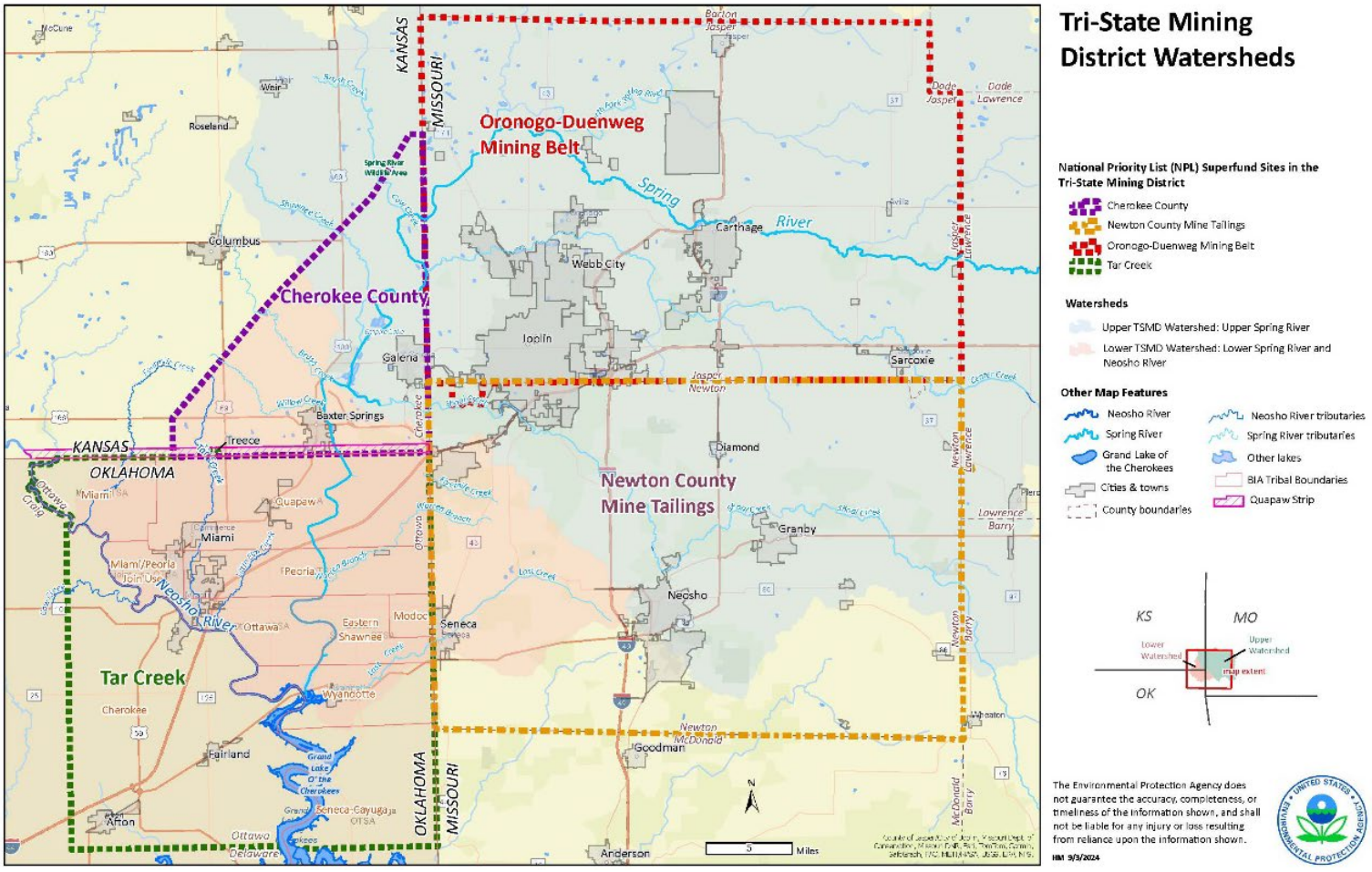
Due to the size of the collective watersheds, EPA has separated them into Upper and Lower units of the TSMD watersheds for study purposes.

<u>Upper TSMD Watershed</u>

- Spring River watershed from the two dams at Empire Lake in Kansas upstream into Missouri.

<u>Lower TSMD Watersheds</u>

- Spring River watershed from the Empire Lake dams downstream to the lake-head delta at Grand Lake O' the Cherokees.
- Neosho River watershed from its confluence with Fourmile Creek to the lake-head delta at Grand Lake O' the Cherokees.
- Lost Creek watershed from its headwaters to the lake-head delta at Grand Lake O' the Cherokees.



Best Practices Within the TSMD Watersheds

Lead is toxic if it is inhaled or swallowed and can cause lifelong negative health effects in children under age 7 and pregnant and nursing mothers. Within the impacted watersheds, EPA recommends minimizing your exposure to lead and other mining wastes in contaminated sediments, soils, and surface water, especially when practicing subsistence lifeways. Families and caregivers of young children can take these precautions when hunting, fishing, gathering, and recreating. For more information, visit: www.epa.gov/mo/protect-your-family-lead-hazards-historic-lead-mining-areas-fact-sheet-august-2022.

***Wash hands*, especially children's hands, after handling soil, playing outside, and before meals.**

Before you eat that fish, check local *Fish Advisories* to prevent unintended ingestion of lead.

After playing in sand, *change clothes*, wash hands, feet, and bathe when returning indoors.

"Pb&J just want to say, please follow these tips every day! Teach me to be lead-free!"
– Your friends, Phoebe bullfrog and Joe Armadillo, aka ***Pb&J.***

Parents and caregivers of young children can use "*Pb&J*" to communicate lead poisoning prevention best practices to kids using friendly characters with simple, memorable rhymes. For free downloadable Pb&J-themed children's materials – including an activity sheet, temporary tattoos, button, and sticker templates (to color in) – visit this link: https://semspub.epa.gov/work/07/30826632.pdf.

Where Are the Tri-State Mining District Watersheds in the Superfund Process?

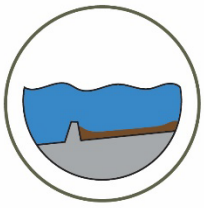
The TSMD watersheds are currently in the Remedial Investigation (RI) and Feasibility Study (FS) portion of the Superfund process. This means that the current focus of work is to characterize the concentration and movement of contaminants in surface water and sediment, and then evaluate potential cleanup options for the TSMD watersheds. After the potential cleanup options are evaluated, EPA will present the preferred cleanup alternative to the public for review. Each TSMD Superfund site has watershed-specific Operable Units (OUs) or project areas with unique characterization and assessment needs. EPA is currently studying perennial streams in each of these watershed OUs, whereas prior site investigations focused on other stream segments. This study also includes sampling and analysis of floodplain soils that may be transported downstream during flooding events.

Completed Watershed Work	Ongoing Watershed Work	Upcoming Watershed Work
• Upper TSMD Watershed Remedial Investigation report • Lower TSMD Watersheds Remedial Investigation report • Lower TSMD Watersheds Human Health Risk Assessment (HHRA) report • Lower TSMD Watersheds Preliminary Remediation Goal (PRG) memorandum	• Upper and Lower TSMD Watersheds data gap sampling, as needed • Combined HHRA report for the Upper and Lower TSMD Watersheds • Combined Ecological Risk Assessment for the Upper and Lower TSMD Watersheds • Pilot Studies to support the FS	• Draft final PRG memorandum • Early or interim action measures to reduce contamination in small sections of the watersheds

Completed Pilot Studies

Pilot studies are short-term remediation projects that provide valuable site-specific data on the effectiveness of new or different cleanup technologies. They can also be used to try out a known technology in new areas where it has not been used before. Within the TSMD, EPA uses many different tools from the Feasibility Study portion of the Superfund process toolbox to implement pilot studies to research and review outcomes and lessons learned. Common watershed pilot study concepts from Feasibility Study tools include sediment traps, dredging, and bank stabilization.

Feasibility Study Tools for Watersheds

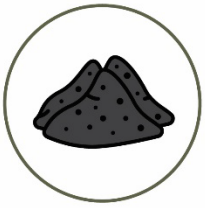


Sediment Traps
Small impoundments that allow sediment to settle out of overflowing water and collect.

Dredging
Contaminated sand and gravel removal from riverbeds, river banks, and nearby floodplains.

Metals Reclamation
Reprocessing of mine waste material to study the amount of heavy metals removed.

Bank Stabilization
The slowing or stopping of erosion along a stream bank through the use of rock and/or tree branch structures.



Biochar
The use of carbon-rich material to immobilize hazardous materials and strengthen soils for revegetation.

Modeling
Computer software used to forecast the movement of contamination throughout a watershed.

For More Information

Short Creek Pilot Study Fact Sheet: https://semspub.epa.gov/work/07/30828925.pdf
Turkey Creek Pilot Study Fact Sheet: https://semspub.epa.gov/work/07/30828926.pdf
Preliminary Remediation Goal (PRG) Memorandum: https://semspub.epa.gov/work/06/100023850.pdf
Upper TSMD Remedial Investigation Report: https://semspub.epa.gov/work/07/30825872.pdf
Upper TSMD Remedial Investigation Report Fact Sheet: https://semspub.epa.gov/work/07/30826462.pdf
Lower TSMD Remedial Investigation Report: https://semspub.epa.gov/work/06/100004764.pdf
Lower TSMD Human Health Risk Assessment Report (HHRA): https://semspub.epa.gov/work/06/9929891.pdf

Short Creek Pilot Study, Cherokee County, Kansas

The Short Creek pilot study investigated the use of sediment traps and dredging as remedial technologies to target and remove contaminated fine-grained sediments from an active natural stream channel.

The sediment trap remained functional for about 16 months before flooding damaged the trap. The last sediment sampling event was in June 2021. About 0.10 cubic yard of material accumulated during the June 2021 event. This accumulation is thought to have occurred via a combination of bedload transport and the settling of suspended sediments.

Evidence of bedload sediment transport outside of the trap and on the exterior of the inlet riprap apron indicated that the trap was effective at separating fine-grained, suspended sediment from coarse-grained bedload sediment.



Turkey Creek Pilot Study, Jasper County, Missouri

The Turkey Creek bank stabilization pilot study investigated the use of stream bank stabilization as a remedial technology to minimize the erosion of contaminated floodplain soils into the stream.

The soil bioengineered bank stabilization remains intact and effective at preventing erosion of contaminated floodplain soils along the stabilized bank. Periodic inspections were performed in the short-term, post-construction period to document impacts of multiple high-flow events.

The study identified logistical challenges and solutions for weather delays, seasonal timing of handling live cuttings, site access, channel dynamics, and availability of plant material. A cost comparison demonstrated that the unit price for bioengineered bank stabilization for this project falls within an estimated range for conventional riprap bank protection at this site. These factors offset each other and support the conclusion that bank stabilization costs are similar for either technology.



Community Highlights

Ottawa Tribe Water Quality Monitoring Program

Photo of sampling locations, courtesy of the Ottawa Tribe

A Clean Water Act Section 106 Grant supports the Tribe's monitoring of surface waters within the Ottawa reservation. Their Environmental Department has collected and analyzed water samples from six locations on a monthly basis for nearly 20 years. Two sampling locations are on the Neosho River, one on Tar Creek, one on Little Elm Creek, and two on the Spring River. The data is used to assess the quality of water and determine if the water bodies meet the water quality standards for their designated uses. The Tribe monitors for basic parameters, such as temperature, pH, turbidity, dissolved oxygen, total nitrogen, and total phosphorus. *They also monitor for lead, cadmium, zinc, iron, and arsenic in water and sediments*. All data is entered into EPA's national water quality database.

Photo of muscles field collection, courtesy of the Peoria Tribe

Peoria Tribe Aquatic Facility

The Peoria Tribe of Indians of Oklahoma founded the Peoria Aquatic Facility to further protect and restore aquatic natural and cultural resources. At the facility, the Tribe is working to recover mussel species populations native to the area that have been endangered, injured, or even lost due to contamination associated with the Tar Creek Superfund Site. The hatchery program at the facility is advancing the recovery of local populations with the end goal of reintroducing them to the site waterways and recovering these mussel populations in the wild. In addition, the facility also supports Tribal subsistence and recreational fisheries by growing bass for sale and stocking ponds. The Tribe aspires for the facility's programming to develop into a model for environmental restoration of aquatic species for other tribes and parties within the TSMD.

Photo of muscles, courtesy of the Peoria Tribe

For More Information

To learn about **Support for Environmental Assessment Grants for Tribes in Region 6**, including quality assurance and sampling and analysis protocols, please visit: www.epa.gov/quality/support-environmental-assessment-grants-tribes-region-6.

Announcements, Key Topics, and Tips

For site-specific announcements, updates, events, and opportunities for public input, visit:

- **Tar Creek Superfund Site:** www.epa.gov/superfund/tar-creek
- **Cherokee County Superfund Site:** www.epa.gov/superfund/cherokeecounty
- **Newton County Mine Tailings Superfund Site:** www.epa.gov/superfund/newtoncountymine
- **Oronogo-Duenweg Mining Belt Superfund Site:** www.epa.gov/superfund/oronogoduenwegmining

EPA ESD for Cherokee County Tar Creek Sediments

In August 2024, EPA issued an Explanation of Significant Differences (ESD) to address mine waste in the main stem of Tar Creek in Kansas for the Cherokee County Superfund Site. Tar Creek, Kansas, is within the Treece subsite (OU4) where the selected remedy in the 2016 Record of Decision (ROD) Amendment included the removal, consolidation, and capping of contaminated sediments during the same Remedial Action as the surrounding mine waste and impacted soils. This ESD expands use of the same strategy and cleanup technology as described in the ROD Amendment to the main stem of Tar Creek. The combination of Remedial Actions in OU4 has been shown to be more efficient, due to reduced costs associated with remobilization, disturbance of capped areas, and/or construction of new capped areas. Contaminated sediments planned to be addressed under OU9; Tar Creek Watershed will now be remediated under OU4.

For more information, please view the Cherokee County ESD at:
https://semspub.epa.gov/work/07/30821317.pdf

Tar Creek Annual Open House

Hosted by EPA Region 6, Quapaw Nation, and the Oklahoma Department of Environmental Quality, the next annual Tar Creek Open House will be held in April 2025!

- The purpose of this open house is to provide additional education and health outreach to community members, partners, and local organizations with a focus on blood lead testing for children and residential yard testing.
- The open house will feature lead health resources and materials, as well as Tar Creek Superfund Site updates and an open session for Q&A.
- Other participants at the 2024 Tar Creek Open House included the Oklahoma State Health Department, Ottawa County Health Department, U.S. Department of Housing and Urban Development's Office of Native American Programs, Oklahoma Corporation Commission, and Local Environmental Action Demanded (L.E.A.D) Agency.
- *Be on the lookout for the official press release of the event in spring 2025!*

Check out the EPA Region 7 Community Information Guide!

The Community Information Guide webpage provides communities, nonprofits, stakeholder groups, community-based organizations, academia, tribes, state and local governments, and other partners with the latest news and information on funding and technical assistance opportunities, meetings, conferences, events, webinars, and other activities related to human health and the environment (covering any EPA program/activity). Visit the page to see what's new: www.epa.gov/aboutepa/region-7-community-information-guide.

About EPA's Community Involvement Program

– Key goals of EPA's Superfund Community Involvement program are to ensure that community members affected by Superfund actions: *1) are aware of EPA's activities; 2) have opportunities to influence site cleanup and reuse decisions, and 3) are aware that their concerns are considered in the site decision-making process.*

Lead Poisoning Prevention Tips: *Let's do our part to be lead-smart!*

EPA has been working in the TSMD to protect families from lead hazards for years. While people are waiting for a lead test and/or cleanup during the "heavy lifting" of EPA's physical cleanup, people can minimize their exposure to lead in the home. A Jasper County Children's Coloring Book character, named "Pb Possum" (after the chemical symbol for lead) promoted lead poisoning prevention for kids at: https://semspub.epa.gov/work/07/30826670.pdf.

"Pb&J," our new lead safety friends, also share tips to reduce or prevent lead exposure:

"Hey! It's ***Pb&J***!
We'll show you the ***way***
to be lead-safe when you eat and ***play***!
Here are three ***tips***,
from our ***lips***:

FREE Children's Activities!

Download ***free*** templates to print stickers, buttons, and a Pb&J children's activity sheet, online, at: https://semspub.epa.gov/work/07/30826632.pdf.

Thank you for making our day! – *Pb&J*

Opportunities to Get Involved!

- **Sign up** for EPA's contact lists for site and/or watershed updates.
- **Attend** EPA's meetings and events.
- **Invite** EPA to participate in or present events in your community.
- **Contact** EPA to provide input on communication or technical assistance needs.
- **Provide** ideas for lead health education for children and their caregivers to prevent lead exposure.

Contact EPA!

EPA's Region 7 Community Involvement Coordinator
Elizabeth Kramer, 913-551-7186 or
kramer.elizabeth@epa.gov or
r7-tmsd@epa.gov

EPA's Region 6 Community Involvement Coordinator
Janetta Coats, 214-665-7308 or
coats.janetta@epa.gov

EPA welcomes community input and ideas on tips and future outreach materials to protect people from lead hazards, especially children under 7 years old, parents, and their caregivers. For mailing list changes, to send comments on this digest, contact the editors, or submit articles for consideration, please contact Elizabeth Kramer, as noted above. Mention of trade names, products, or services does not convey, and should not be interpreted as conveying, official EPA approval. endorsement, or recommendation.

United States Environmental Protection Agency

U.S. EPA Region 7
EJCEERD/Community Participation and Site Information Branch
11201 Renner Blvd., Lenexa, KS 66219 (Attn: Kramer)

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Permit No. G-35
Lenexa, Kansas

Fall 2024/Winter 2025

Learn more about EPA's Site Cleanups on the web at:
www.epa.gov/mo/missouri-cleanups
www.epa.gov/ks/kansas-cleanups

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