

Baldwin Park

Site Name: Baldwin Park

Classification: Class 4

Date of Registry Placement: September 23, 1986

Site Address: Baldwin Park is located on High Street in the extreme northeast corner of the town of Aurora, Lawrence County, Missouri, NE 1/4, Sec. 7, T26N, RW, Aurora Quadrangle

Present Property Owner: City of Aurora

Lead Agency: Missouri Department of Natural Resources (Department)

Waste Type: 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD), 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T), hexachlorophene, and lead

Quantity: Not determined

Site Description and Environmental Concern:

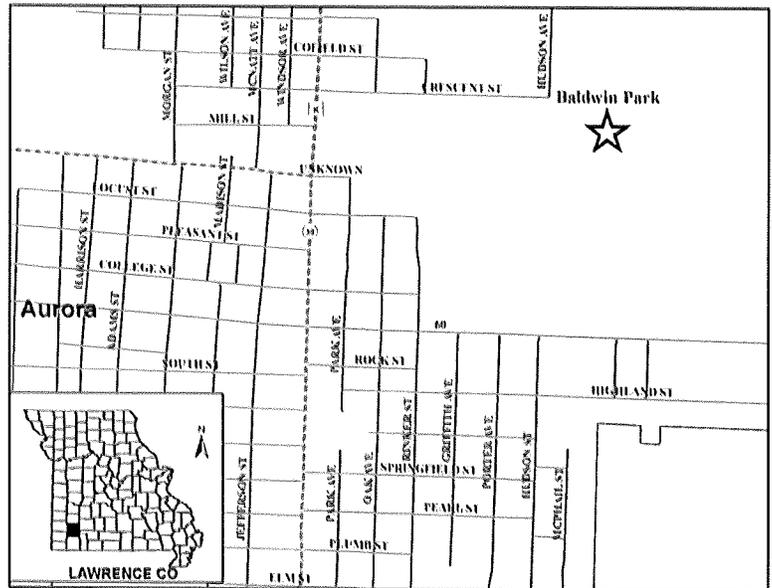
The Baldwin Park site is now the location of a municipal park. The area historically operated as a zinc ore strip mine. When mining operations ceased, the city of Aurora and surrounding communities used the pits as a dump for municipal trash. The U.S. Environmental Protection Agency (EPA) and the Department received reports that, in the mid-1960s, the Hoffman-Taff Corporation disposed of TCDD-contaminated wastes at the site. Later sampling substantiated these reports. In the 1970s, the city closed the dump and installed a cap over the site, and developed the property later into a park.

In July 1996, following a request by the city of Aurora to reduce the area listed on the registry, an environmental contractor conducted additional sampling to delineate the area of contamination. The contractor did not detect TCDD in the park's northern and northeastern areas. In response, the Missouri Department of Natural Resources (Department) reduced the area on the registry to include only 60 acres in the park's southern portion.

Remedial Actions:

In October 1983, EPA initiated investigations at Baldwin Park. Sample results indicated the presence of TCDD at concentrations ranging from 2.7 to 743 parts per billion (ppb), with the highest concentrations detected in discrete samples collected from exposed bags and drums. During this time period, EPA compared dioxin soil results solely to the EPA Preliminary Regional Goals (PRGs) for residential soil of 1 ppb and industrial soil of 5 - 20 ppb. In November 1984, EPA conducted additional sampling to determine the extent of contamination.

In winter 1987, EPA contractors excavated and removed approximately 250 cubic yards of soil that exceeded 20 ppb TCDD. The contractors transported the excavated soil to EPA's mobile incinerator in Verona, Missouri. The contractor covered and capped the excavated areas, as well as areas showing TCDD surface contamination between 1 and 20 ppb. The cap consists of 6 inches of sand; a brightly colored plastic liner that serves as an indicator; another 6 inches of sand; and 6 inches of topsoil. The topsoil was seeded and covered with a biodegradable erosion-control mat. The city of Aurora agreed to provide site maintenance and



to prevent excavation of the cover. To ensure that contaminated groundwater was not migrating off site, EPA monitored groundwater for one year.

In 2001, the Department conducted a Combined Preliminary Assessment/Site Investigation of the Lawrence County Mining site, which revealed elevated levels of lead in several residential yards in Aurora. As a result, EPA conducted a removal action in the area and excavated between 5,000 and 8,000 cubic yards of soil from residential yards.

In 2002, the Department approved the use of the Baldwin Park site as a repository for lead-contaminated soils excavated during the Lawrence County Removal Action. Contractors used the lead-contaminated soils in the construction of a berm, adjacent to the on-site gun club, to reduce noise levels and shot hazards inherent with the club's usage. Surface soil in the berm area contains lead at concentrations above EPA's residential action level of 400 parts per million. The contractors placed the lead-contaminated soil at the bottom of the berm structure, covered the lead-contaminated soil with 1 foot of clean fill, and vegetated the soil cap to eliminate erosion and exposure potential. The city of Aurora has responsibility to maintain the berm. The berm area is fenced to restrict access.

In summer 2004, Department staff met with the city of Aurora's Parks and Recreation Department to discuss plans for Baldwin Park. The city envisioned a set of walking trails and possibly fishing in some of the on-site subsidence ponds. In spring 2005, the Department performed an initial site assessment that characterized the park's mining-impacted portions. During the same period, the city of Aurora contracted with the University of Missouri to provide a final park plan. The park planning document included extensive development plans and detailed mapping of metals contamination. Department staff conducted additional sampling that confirmed fish obtained from the park ponds were safe for consumption.

In January 2006, contractors began site reclamation with the construction of perimeter fencing in an effort to prevent dumping and illegal vehicle use in the park. In October 2007, the city of Aurora received an EPA Brownfields Cleanup Grant to remediate soils impacted by former mining activity. In 2009, contractors removed vegetation and the top layer of contaminated soil and treated the remaining soil with high phosphate poultry litter to reduce metals toxicity. In September 2010, following Missouri Department of Health and Senior Services (DHSS) recommendations, contractors capped areas that contained residual contamination with 1 foot of clean soil and/or 4 inches of crushed aggregate. Contractors vegetated the capped areas with native plants.

In December 2010, the city submitted the final Cleanup Grant Project Report to EPA. The city planned to develop hiking trails and a fishing pond in the project treatment area. The city has not yet developed any hiking trails. In 2011, the city fenced the pond area. The city completed a Final Concept Plan dated April 25, 2022, for Baldwin Park. It includes adding a full-size baseball field, adding a softball field, playground, mountain bike and nature trails, play and picnic areas, and removing the shooting range. The city applied for a Land and Water Conservation Fund grant to help them fund this plan. Potentially, the city will begin construction on the new ballfields in 2023.

On April 20, 2022, the Department conducted the FY22 annual inspection, during which inspectors noted nothing of significance.

General Geologic and Hydrologic Setting:

The Baldwin Park site is located on a broad, upland area characterized by very gentle slopes. The site straddles the drainage divide between the west-flowing Chat Creek and the north-flowing Elm Branch of Honey Creek.

Historically, this area has undergone some major land-use changes that altered the site's natural features. The area near the railroad tracks reportedly was swampy at one time. However, as settlers moved into the region, they drained the swampy area and converted it to an apple orchard. In 1886, miners discovered lead ore deposits, and subsequent surface and underground mining drastically altered the topography. The mining, which ceased in 1955, created open shafts, pits, millworks, and tailings piles. Reclamation has occurred at many of the mined areas. Water now fills some of the remaining open shafts and pits.

Exposed mineshafts reveal about 20 feet of residuum derived from the weathering of underlying bedrock.

The residuum is composed of reddish-brown, cherty, silty clay. Typically, this material develops a very blocky structure and exhibits high permeability. However, the residuum at the site seems to be atypical, as evidenced by the historically high water levels and swampy conditions.

The bedrock surface is uneven. The uppermost bedrock at the site is the Mississippian-age Burlington-Keokuk Limestone, except in the park's southern part, where a relatively thin layer of sandstone, shales, conglomerates, and limestone cover the Burlington-Keokuk in some locations. The Burlington-Keokuk Limestone, along with underlying Mississippian-age cherty limestones, make up the shallow aquifer in this area. Individual rural water supplies extensively use this aquifer, which is over 350 feet thick.

A confining layer separates the shallow aquifer from the deeper Cambrian- and Ordovician-age carbonates and sandstones that make up the deep aquifer. The deep aquifer is about 1,800 feet thick. Because of very high yields from this aquifer, it provides public water supplies for the area.

Both Chat Creek and Elm Branch are gaining streams near the site, but both lose water to the subsurface downgradient of the site. The lost water recharges the shallow aquifer, and some of it later discharges from springs. Water tracing studies have shown that water lost to the subsurface in the Honey Creek drainage emerges at Big Spring near the mouth of Williams Creek.

Public Drinking Water Advisory:

The combined Aurora-Verona public water system uses several deep wells in the area for drinking water. The closest of these wells is just under 1 mile from this site, but it is cased to over 300 feet deep. A small drive-in restaurant about 0.7 mile southeast of the site uses one public water well that is only cased to 165 feet deep and is likely open to both the shallow Springfield Plateau Aquifer and the deep Ozark Aquifer. Due to the relatively low permeability of soils in this area, site-related contamination is not likely.

Health Assessment:

The contaminants of concern at this site are TCDD, 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T), hexachlorophene, and lead. Please refer to the Health Assessment Chemical Table in Appendix A for a description of the potential adverse health effects associated with these contaminants.

DHSS recommends replacing warning signs around the area of contamination so they are visible to the public. Good hygiene practices, such as hand washing, can go a long way to reduce exposures. Any trails developed over areas with elevated lead levels should have adequate cover, using either mulch or gravel. As long as the cap remains intact, this site does not appear to present a significant public health risk at this time. If site conditions change to allow exposure to contaminated soil, adverse health effects could result.

For more information regarding health-related issues, please contact the Missouri Department of Health and Senior Services, P.O. Box 570, Jefferson City, MO 65102, 573-751-6102.