

FAQs

For the 2016 DTSC-Caltrans Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils

October 2016

1. Why is lead a concern for roadway improvement projects?

Lead is a heavy metal that was used in paints, gasoline, and industrial purposes. Intake of lead is toxic to the nervous system, blood, heart, liver, and reproductive system. Children and pregnant women are particularly vulnerable. Lead exposure during pregnancy can cause premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in children. These effects are more common if the mother or baby is exposed to high levels of lead. Adults can suffer from reproductive problems (in both men and women), high blood pressure, digestive problems, nerve disorders, memory and concentration problems, muscle and joint pain. If not detected early, children with high levels of lead in their bodies can suffer from damage to the brain and nervous system, behavior and learning problems (such as hyperactivity), slowed growth, hearing problems, and headaches.

Refiners in the United States started adding lead compounds to gasoline in the 1920s in order to boost octane levels and improve engine performance by reducing engine 'knock' and allowing higher engine compression. Tailpipe emissions from automobiles that used leaded gasoline contained lead and resulted in aerially deposited lead (ADL) being deposited in and along roadways throughout the State. The phasedown of lead in gasoline began in 1974 when, under the authority of the Clean Air Act Amendments of 1970, the U.S. Environmental Protection Agency (USEPA) introduced rules requiring the use of unleaded gasoline in new cars equipped with catalytic converters. The introduction of catalytic converters for control of hydrocarbon (HC), nitrous oxide (NO_x) and carbon monoxide (CO) emissions required that motorists use unleaded gasoline because lead destroys the emissions control capacity of catalytic converters. Beginning in 1992, lead was banned as a fuel additive in California. Lead-contaminated soil still exists along roadsides and medians and can also be found underneath some existing road surfaces due to past construction activities.

2. What are acceptable concentrations of lead in soil in California?

In 2007 the California Office of Environmental Health Hazard Assessment (OEHHA) developed a 1 microgram per deciliter (µg/dL) benchmark for source-specific incremental change in blood lead levels for protection of school children and fetuses. In 2009 OEHHA commenced an effort to estimate lead concentrations in soil that would lead to an incremental increase in blood lead (PbB) of up to 1 µg/dL, in people exposed

to that soil (Revised California Human Health Screening Levels for Lead, <http://oehha.ca.gov/media/downloads/cnr/leadchhsl091709.pdf>, Note table 3. For the residential scenario for lead, OEHHA evaluated the exposure to a child resident. For the commercial/industrial scenario, OEHHA evaluated the exposure to a pregnant adult worker.

The Department of Toxic Substances Control's (DTSC) Leadsread model was used to estimate blood lead concentrations in children. The Leadsread model considers exposure to lead in soil by three pathways: ingestion, re-suspension and inhalation, and dermal contact. The Leadsread model was queried for the soil lead concentration that would give rise to a 90th percentile estimate of increase in blood lead of 1 µg/dL, which resulted in a soil lead concentration of 80 milligrams per kilogram (mg/kg). This value is currently used by DTSC as a screening level for residential, or unrestricted, land use. Soils with a total lead concentration of 80 mg/kg or less are usually considered acceptable for reuse without restriction.

U.S. EPA's Adult Lead Model (ALM) was used to estimate the blood lead concentration in a fetus of an adult worker exposed to lead-contaminated soil. The model was queried directly for the soil lead concentrations that would give rise to the 90th percentile estimate of change in blood lead of 1 µg/dL, which resulted in a soil lead concentration of 320 mg/kg. This value is currently used by DTSC as a screening level for commercial/industrial land use. Soils with a total lead concentration of 320 mg/kg or less are usually considered acceptable for use at commercial/industrial properties with prior written approval from DTSC, but land use restrictions are required to prevent unacceptable risk by limiting the use of the property.

The application of these screening levels in determining appropriate actions for soils containing lead is further discussed in Human Health Risk Assessment (HHRA) Note Number Three (<https://www.dtsc.ca.gov/assessingrisk/humanrisk2.cfm>) which is issued by the Human and Ecological Risk Office of DTSC.

3. What is DTSC's authority to regulate the reuse of soils containing lead?

Government agencies and private entities performing roadwork, as well as their contractors, may be liable under State and federal laws as an "owner or operator", "transporter" or "arranger" based on any excavation, grading or construction activities associated with the movement or placement of soils containing a hazardous substance that may pose an imminent and substantial danger to the public health or welfare. In addition, these parties may be a "generator" of ADL-contaminated soil in the course of future activities associated with roadway projects.

Using the risk based screening levels developed by OEHHA, excavated soils with a lead concentration less than or equal to 80 mg/kg total lead (analyzed by USEPA Method 6010 or 6020) would be acceptable for reuse without restrictions. Excavated

soils that are considered a California hazardous waste (total lead concentration greater than or equal to 1,000 mg/kg or a soluble lead concentration greater than or equal to 5 milligrams per liter [mg/L] as determined by the California Waste Extraction Test [CA-Wet]) or are a RCRA hazardous waste must be disposed of in a Class I hazardous waste landfill. Excavated soils with lead concentrations below that is considered to be a hazardous waste and above 80 mg/kg total lead may be eligible for reuse with specific restrictions to reduce or eliminate exposure, with prior written approval from DTSC, or may be disposed of at an appropriately permitted landfill. The *2016 DTSC-Caltrans Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils* establishes requirements and additional allowances for soil reuse within the State highway system that are based on a risk evaluation specific to California highways.

4. Must soils with a lead concentration above the unrestricted use level be cleaned up if they are not excavated as part of the highway improvement project?

Soils within the roadway right of way with a lead concentration above the unrestricted use level (currently 80 mg/kg) that are not excavated do not need to be cleaned up. Health and Safety Code Section 25321(b) states that emissions from the engine exhaust of a motor vehicle are not included in the definition of "Release". Until these soils are excavated, graded or a part of construction activities associated with the movement or placement of contaminated soils, there has not been a release or a threatened release of a hazardous substance.

5. Does the *2016 DTSC-Caltrans Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils* apply to minor soil disturbance such as installing a small diameter signpost, planting a plant, or installing a small diameter utility line within Caltrans right of way?

If an activity will only cause a minor disturbance of the soil and all of the soil will be put back in the immediate vicinity of the hole or trench, the requirements of the *2016 DTSC-Caltrans Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils* do not apply. However, if there is any excess soil that can't be reused in the immediate vicinity of the hole or trench or if grading is required, separate prior written approval is required from DTSC issued to the entity excavating the soil and property owners receiving the soil.

6. Under the *2016 DTSC-Caltrans Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils*, how will soils be managed in areas where Caltrans highway construction projects impact local roadways, such as at the end of highway entrance and exit ramps?

If all project notifications required by the ADL Agreement and a disposal agreement between Caltrans and the local roadway owner are provided to DTSC, soil, whose lead concentration is

1. below that considered to be a hazardous waste,
2. at or below 320 mg/kg total lead, and
3. generated from a local roadway facility under the control, management, maintenance, or jurisdiction of Caltrans during project construction,

can be handled and managed in the same manner as described in the ADL Agreement on both the highway and local roadway within the project limits. To access more information about disposal agreements with Caltrans, see http://www.dot.ca.gov/hq/env/haz/hw_adl.htm.

7. Are city and county roadway projects covered under or subject to the 2016 DTSC-Caltrans Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils?

No. City and county roads also have the potential to contain aerially deposited lead impacted soil, but the *2016 DTSC-Caltrans Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils* only applies to projects on the State highway system performed by Caltrans or under Caltrans direct oversight through a partnering agreement such as a cooperative agreement. Separate written approval would be required from DTSC for reuse of ADL contaminated soil over 80 mg/kg lead for local roadway projects and would be based upon site specific conditions. Approval for reuse would be subject to CEQA and DTSC would be the lead agency for those discretionary decisions.

8. Are soils excavated from the State highway under the authority of an encroachment permit by entities other than Caltrans and Caltrans' contractors covered under the 2016 DTSC-Caltrans Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils?

Soils, with the potential for lead concentrations over 80 mg/kg, excavated from the State highway by entities other than Caltrans are only covered under the *2016 DTSC-Caltrans Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils* if

- the work is being done as a joint project between Caltrans and another governmental entity through a partnering agreement such as a cooperative agreement;
- Caltrans has direct oversight of every phase of the project delivery process from project initiation through construction;
- the partnering governmental entity is able to and has agreed to meet all requirements of the Agreement applicable to them.

In cases where the Agreement does not apply, separate prior written approval from DTSC issued to the entity excavating the soil and the property owner receiving the soil would be required for soil reuse at a specific location or the soil could be disposed of at

an appropriately permitted landfill. Approval for soil reuse would be subject to CEQA and DTSC would be the lead agency for those discretionary decisions. Separate written approval from DTSC is not required for minor disturbances of soil if all of the soil will be put back in the immediate vicinity of the hole or trench it originated from. Examples of minor disturbances are installation of a small diameter signpost, planting a plant, or installing a small diameter utility line in cases where all disturbed soil can be put back in or immediately adjacent to the hole or trench it originated from.

9. If a government or private entity is planning a project and may need to manage ADL-contaminated soil how can they get more information?

If you have additional questions regarding the management of ADL soils along California's roadways contact Perry Myers at ADL@dtsc.ca.gov.