STATEMENT OF QUALIFICATIONS

LEAD RISK ASSESSMENT



Geosyntec consultants



GEOSYNTEC OVERVIEW

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Geosyntec is a consulting and engineering firm that works with private- and public-sector clients to address new ventures and complex problems confronting our environment, natural resource, energy, and civil infrastructure. We serve clients from more than 130 offices in the United States, Canada, the United Kingdom, Ireland, Sweden, Spain, Finland, the United Arab Emirates, Saudi Arabia, and Australia. With more than 2,800 scientists, engineers, and other professionals from around the globe, we work each day to forge an inclusive and equitable environment for all our employees, clients, partners, and for the communities we serve.

GEOSYNTEC'S RISK ASSESSMENT AND TOXICOLOGY ACTION GROUP

Geosyntec's risk assessment and toxicology action group, with over 200 practitioners, includes experts in the fields of toxicology, risk assessment, and public health. Our core focus in applied toxicology and ecotoxicology is supported by specialists in complementary fields like statistics, air dispersion and deposition modeling, biotrophic feed web modeling, vapor intrusion, and industrial health and safety. We deliver human health and ecological risk assessment services that identify best-value approaches to evaluate the implications for exposure and liability and remediate contaminated sites. Our risk assessment specialists work alongside our technology leaders, remediation practitioners, and internal and external counsels developing site-specific, pragmatic solutions. We characterize risk and tailor our approach to meet our client's goals for compliance, financial management, and environmental stewardship. We also provide expert consultation and testimony on environmental, worker, and consumer exposure issues for our legal clients. Our practitioners are experts in addressing allocation and complex issues associated with high-profile sites and integrating remediation and re-development plans with sensitive land use designs, such as residential neighborhoods, schools, recreational facilities, or wildlife habitats.



Lead contamination at Superfund sites presents a threat to human health and the environment.

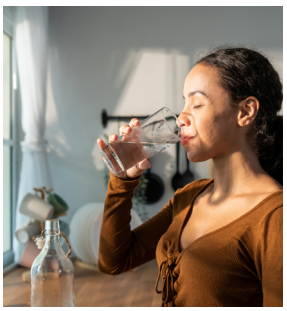
LEAD CHALLENGES

Lead, a naturally occurring element, can adversely impact nearly every system in the human body. When inhaled or ingested, lead is harmful to the developing neurologic systems of animals and humans (particularly those of fetuses and young children). Every state and the District of Columbia have laws designed to limit children's lead exposure potential.

Lead has been used in a wide variety of products found in and around residential homes, including paint, ceramics, pipes and plumbing materials, solders, gasoline, batteries, jewelry, ammunition, and cosmetics. Lead can also be emitted into the environment from industrial sources and contaminated sites, such as former lead smelters and mining sites. Over time, lead has become a common environmental contaminant at Superfund sites across the country. Lead contamination at Superfund sites presents a threat to human health and the environment.







Because their growing bodies absorb more lead than those of adults and because their nervous systems are more sensitive to its damaging effects, lead is particularly dangerous to children. For example, when drinking water is the source, children exhibit much higher intake relative to their body weight than adults.

The United States Environmental Protection Agency (USEPA) response actions seek to limit lead exposure for children to minimize blood lead levels to as low as possible, but below the threshold of 5 micrograms of lead per deciliter of blood (µg Pb/dL). To help in making this determination, the Integrated Exposure Uptake Biokinetic (IEUBK) model and the Adult Lead Model (ALM) estimate the concentration of lead in the blood of children, pregnant women, and their developing fetuses who might be exposed to lead-contaminated soil with additions considered for water and food intakes. The model assesses a host of intake pathways, focused on soil, such that there is a less than 5% chance of predicted fetal or child blood-level concentrations exceeding the 5 μg Pb/dL limit. The level to which USEPA remediates lead contamination at Superfund sites is guided by risk assessors' application of the IEUBK model and the ALM for local demographics and site-specific scenarios to estimate blood-lead concentrations. These findings help USEPA estimate possible adverse health effect exposures.

Geosyntec's specialists across disciplines offer many services to address the varied challenges posed by lead, from public engagement and risk communication to quantitative modeling and exposure assessments that can be used to derive health-protective residual concentrations.



PROJECT HIGHLIGHTS

Geosyntec risk assessment and toxicology practitioners have experience assessing and remediating lead-contaminated sites. Our technical experts help our clients navigate risk communication problems, advocate for fairly allocated site cleanup costs, and gain acceptance from regulators for novel site-remedies. They have provided community outreach and support to state regulatory agencies and are prepared to help address concerns from regulators and the public regarding changes in state and federal regulations. Geosyntec risk assessors and toxicologists have experience in providing litigation support and stakeholder communication assistance.

BLACKWELL ZINC SUPERFUND SITE
OKLAHOMA

- Geosyntec developed a human health risk assessment for soil lead in residential and commercial properties in the vicinity of a former zinc smelter facility in response to comments from USEPA during a 5-year review.
- We conducted in vitro bioaccessibility testing of lead in site soil as an input to USEPA's IEUBK model and we developed a site-specific remedial goal for soil using the IEUBK model. We also reviewed and analyzed blood-lead-monitoring data from children in the community, as well as child-blood-lead data from other counties in the state, to evaluate trends and factors that could potentially contribute to elevated blood-lead levels.
- Geosyntec worked with representatives of USEPA, Oklahoma Department of Environmental Quality, and the Agency for Toxic Substances and Disease Registry (ATSDR) on issues related to ongoing remedial actions and public health evaluations.

SMALL ARMS RANGE RISK ASSESSMENT, NAVAL STATION
GUANTANAMO BAY, CUBA

- Geosyntec directed a human health risk assessment for lead and other metals in soil associated with a former firing range that had been closed more than 25 years without an assessment of potential environmental impacts associated with historical site activities.
- The base was evaluating several redevelopment options for the area in which the range had been located. Therefore, the risk assessment addressed a variety of exposure scenarios relevant to the redevelopment planning (e.g., residential, commercial/office, and recreational). The risk assessment was used to scope and design several remedial actions to address elevated concentrations of lead in soil under the potential site redevelopment scenarios.

LCP CHEMICALS SUPERFUND SITE
GEORGIA

- Geosyntec conducted a human health risk assessment and an ecological risk assessment for two operable units (terrestrial uplands and estuary) at a former chlor-alkali and petrochemical manufacturing facility.
- Primary chemicals of concern included lead, mercury, and polychlorinated biphenyls (PCBs).
- For the estuary, numerous sampling stations were evaluated annually for several years for sediment and surface water chemistry, chronic toxicity of surface water and sediment, benthic invertebrate community structure, and chemical body burden in a variety of fish, blue crabs, fiddler crabs, marsh grass, and insects. The ecological risk assessment required the integration of these studies to develop risk estimates and cleanup levels.
- We negotiated with USEPA and Georgia Environmental Protection Division regarding cleanup criteria and remediation strategies for the site.

BENCH-SCALE BIOAVAILABILITY SOIL TREATMENT TRIALS
PORT KEMBLA, NEW SOUTH WALES, AUSTRALIA

- Geosyntec provided key critical review of an investigation of the addition of amendments to lead-impacted soil to reduce the bioavailability and subsequent risk to human populations.
- The method to evaluate bioavailability, in vitro relative bioaccessibility (IViRBA) analysis, was reviewed for consistency with standard operating procedures established by USEPA and methods recommended within Australia.
- Standard operating procedures and the open literature were reviewed to decide whether the IViRBA analysis was representative of or correlated to in vivo bioaccessibility (IVeRBA) methods.
- The findings of the review were submitted as comments on the validity of the proposed methods, and recommendations based on recent literature were provided to improve the accuracy and validity of the soil amendments investigation.

HUMAN HEALTH RISK EVALUATIONS AND LIABILITY ASSESSMENT STEMMING FROM LEAD-SHEATHED TELECOM CABLES
CONFIDENTIAL CLIENT, MULTIPLE STATES, US

- Geosyntec has been retained by a nationwide telecom client to assess the implications for fugitive release of lead from telecom cables, whether strung aerially, buried underground, or submerged in surface water bodies. Geosyntec is actively engaged to characterize emissions on local and regional levels to address public claims and concerns.
- Geosyntec will assess the nature of exposure (e.g., direct contact with lead-contaminated surface or subsurface soil, inhalation of dust entrained from contaminated surface soil, or incidental ingestion of surface water while recreating) in light of the potential populations at issue (e.g., nearby school, unrestricted access, effective institutional or land-use controls to preclude direct and indirect exposure) to evaluate human health hazard using USEPA risk assessment protocols and approved quantitative intake modeling.

We are engineers, scientists and innovators.



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