

CALIFORNIA ENVIRONMENTAL QUALITY ACT INITIAL STUDY

The Department of Toxic Substances Control (DTSC) has completed the following document for this project in accordance with the California Environmental Quality Act (CEQA) [Pub. Resources Code, div. 13, § 21000 et seq] and accompanying Guidelines [Cal. Code Regs., tit. 14, § 15000 et seq].

PROJECT TITLE: Agreement with the California Department of Transportation for reuse of aerially deposited lead-contaminated soils		CALSTARS CODING:
PROJECT ADDRESS: Existing state owned highway right of ways within all Caltrans Districts.	CITY:	COUNTY:
PROJECT SPONSOR: Kim Christmann	CONTACT: Kim.Christmann@dot.ca.gov	PHONE: 916-653-3265

APPROVAL ACTION UNDER CONSIDERATION BY DTSC:			
<input type="checkbox"/> Initial Permit Issuance	<input type="checkbox"/> Permit Renewal	<input type="checkbox"/> Permit Modification	<input type="checkbox"/> Closure Plan
<input type="checkbox"/> Removal Action Workplan	<input type="checkbox"/> Remedial Action Plan	<input type="checkbox"/> Interim Removal	<input type="checkbox"/> Regulations
<input checked="" type="checkbox"/> Other (specify): Inter-agency Agreement			

STATUTORY AUTHORITY:
<input checked="" type="checkbox"/> California H&SC, Chap. 6.5 <input type="checkbox"/> California H&SC, Chap. 6.8 <input type="checkbox"/> Other (specify):

DTSC PROGRAM/ ADDRESS: Brownfields and Environmental Restoration Program 8800 Cal Center Drive Sacramento, CA 95826	CONTACT: Perry Myers	PHONE: 916-255-3708
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<p>PROJECT DESCRIPTION: The California Department of Toxic Substances Control (DTSC) is proposing to enter into a Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils (Agreement) with the California Department of Transportation (Caltrans) that would, under specified terms and conditions, allow Caltrans to excavate, stockpile, transport, and reuse soil contaminated with aerially-deposited lead (ADL) that may be encountered during highway improvement projects conducted within existing state-owned highway right-of-ways (Agreement). These projects are individually subject to additional environmental impact assessments as required by the California Environmental Quality Act (CEQA) when Caltrans proposes and approves projects for detailed design and construction.</p> <p>Background</p> <p>In response to heavy travel loads, many highways and freeways are being improved by Caltrans to increase vehicle capacity and travel safety. The improvement of existing roads allows increased vehicle use without the significant additional cost of purchasing additional rights-of-way that would be needed for a new freeway or roadway alignment. Roadway improvement projects may include filling in existing median areas, widening out over the existing highway shoulders or a combination of widening in these areas. Often, the widening of the driving surface of freeways is associated with the reconstruction and upgrading of bridges and interchanges. Construction of the widening normally requires development of a two to three-foot thick sub base to carry the new widened lanes and their associated traffic. To allow development of the sub base, existing soils are normally excavated and removed as part of the project construction.</p> <p>Caltrans has discovered soils with levels of aerially-deposited lead above those appropriate for unrestricted use existing on unpaved median and shoulder areas of some of its roadways. The lead contamination is believed to come from the use of leaded gasoline and fuels that were used for many years by the state's driving population.</p>

Traditionally, Caltrans has relinquished most excess project soils to the contractor for disposal. However, Caltrans cannot relinquish soils that are considered hazardous waste, such as soils with hazardous levels of lead. Normally, wastes that meet California criteria for hazardous wastes are hauled to permitted disposal facilities. However, hauling of these low levels of lead-contaminated soils to a Class I hazardous waste disposal facility has become very costly. As an alternative, DTSC's Human and Ecological Risk Division (HERD) and Geological Services Unit (GSU) have determined that certain lead contaminated wastes can, under certain conditions, be managed on-site (i.e. not sent to a permitted disposal facility) so that there is not a threat to human health or the environment. The capability to manage such soils on-site can result in considerable cost-savings to the State of California and a significant reduction in the amount of soils being disposed of at the limited number of permitted disposal facilities in the State. The HERD and GSU recommended conditions are incorporated into the proposed Agreement. The memorandums from HERD are attached as Exhibit 1 and Exhibit 2, and the memorandum from GSU is attached as Exhibit 3.

A. Project Activities:

With approval of the Agreement, ADL-contaminated soils (as defined in the Agreement) that are excavated for the improvement of transportation corridors would be available for reuse within the transportation corridor in accordance with conditions specified in the Agreement. It is anticipated that a variety of methods will be identified for the reuse of these soils. Currently, Caltrans has envisioned its use in embankments, and widening and flattening thereof; use as backfill for structures, retaining walls, trenches and depressions resulting from the removal of obstructions; as road base fill; contouring of fill areas; raising grades e.g., Park & Ride lots; and the placement of soils under the traveled way. Additional uses of these soils may be identified as Caltrans designs more projects with reuse of these soils in mind. Attached are two examples of proposed methods for the placement of lead-containing soils within the project as sub-base and fill area behind a retaining wall (See Exhibit 4). These plans are conceptual examples, and do not necessarily apply directly to specific Caltrans projects. As previously stated above, these projects are individually subject to additional environmental impact assessments as required by CEQA when Caltrans proposes and approves projects for detailed design and construction.

B. Proposed Storage Lifetime

The placement of ADL-contaminated soils within the embankments, fills, and subsurface structures of the freeway facilities is envisioned to be long-term storage of these soils. Normally a highway has a design life of 30 years; however, many roadways now have life spans in excess of 30 years, with some newer freeways being designed for 50 year life spans. At the end of the facility design life span the facility will normally be upgraded (widened and resurfaced) or maintained as is for the foreseeable future. Caltrans very rarely abandons high-occupancy alignments. The Agreement will require Caltrans to conduct long-term maintenance of ADL-contaminated soil that is managed pursuant to the Agreement. The Agreement will also require any new owner of areas that contain reused ADL-contaminated soil to comply with the same obligations that are imposed on Caltrans.

C. Management Practices

The following describes handling methods used from the point of generation to placement or storage of the soils:

1. Clearing and Grubbing:

Clearing and grubbing of the construction area is generally performed in advance of excavation and grading operations. This work consists of clearing all vegetable growth, such as trees, logs, upturned stumps, roots of downed trees, brush, grass, weeds, and all other objectionable material, including concrete or masonry, within the highway construction areas. Unless otherwise specified, the entire length of the project is cleared. Dirt, sediment, or soil clinging to this material is separated at the location of removal.

2. Excavation:

Selected soil excavation consists of excavation involved in the grading and construction of the roadway. ADL-contaminated soils will be defined in the plans as material that is excavated from an identified location within the right-of-way, as shown on the plans or specified in the special provisions of each contract.

Excavation is done to grade tolerance and can vary no more than .05 foot to .1 foot above or below the grade established by the Engineer and/or plans. With contaminated soils, excavation operations will be conducted in

such a manner that haul vehicles will not travel over the contaminated soils. During excavation the contractor must comply with all the requirements set forth in Divisions 11,12,13,14, and 15 of the Vehicle Code. Equipment will normally include graders, scrapers, front end loaders, dump trucks, and tractor/trailer trucks.

3. Hauling:

When practicable, the contaminated soil will be hauled directly from the excavation location to its final position where it will be placed and compacted to meet roadway compaction specifications. Any spillage resulting from hauling operations along or across the traveled way will be removed immediately by the contractor. As shown on the plans, vehicles will be loaded within the limits of excavation. When loaded, no soil will extend above the sides or rear of the vehicle.

In some instances, primarily due to construction restrictions, it may not be practical to place contaminated soil directly into its final placement point. In these cases, the soil will be stockpiled in a designated area while waiting for placement on the project.

4. Dust Control:

This work consists of applying either water or dust palliative, or both, for the alleviation or prevention of dust. Dust resulting from the performance of the work, either inside or outside the right-of-way, shall be controlled by the contractor. Water for use in the work may be potable or non-potable. If the contractor uses reclaimed waste water in the work, the sources and discharge of reclaimed waste must meet the California Department of Health Services water reclamation criteria and the Regional Water Quality Control Board requirements. The standard and special provisions of each contract specifically address and inform the contractor of the need for stringent dust control measures. In addition, Caltrans must comply with any local air district's fugitive dust control rules for construction activities.

5. Erosion Control:

Where erosion of soil may cause water pollution due to the nature of the soil or the season of the year, the contractor shall install permanent erosion control features concurrently with or immediately following grading and or placement operations. Soil derived from roadway work will not be deposited in stream channels or where it would be washed away by stream flows. Soil will not be allowed to drift onto pavement. Erosion control plans from the contractor are mandated by the standard specifications. Special provisions of each contract for covering or protecting stockpiles of these soils will be included in contracts where immediate placement of these soils is not possible.

6. Ultimate Disposition of Waste:

ADL-contaminated soil reused onsite will be placed in embankments, placed in general fill areas, behind retaining walls, and below pavement or shoulder sections. Compaction, lifts, and moisture will depend on final placement location. Placement and compaction will conform to standard provisions "Earthwork" and "Aggregate Sub-base". Contaminated soil will be used as shown on the construction plans or specified in the special provisions of each contract. Contaminated soil not used as a specific layer will be placed in the roadway prism in accordance with standard contract provisions for placing embankment soil or structure backfill. When contaminated soils are shown on the plans or designated in the special provisions of each contract as a specified layer, spreading and compacting the soil shall conform to standard aggregate sub-base provisions.

ADL-contaminated soil removed from the State right-of-way for reuse elsewhere will be managed appropriately to ensure it does not pose an unacceptable risk to human health or the environment. Soils with a concentration of total lead not exceeding 320 mg/kg may be used, if appropriate, at commercial/industrial properties. If ADL-contaminated soil is used at a real property located outside the State right-of-way, Caltrans will submit to DTSC a completed "Agreement between a contractor working on State facilities and a real property owner for disposing construction-related material on property owner's property" so DTSC may track the final placement of the contaminated soils.

D. Operational Procedures

Under the heading of public safety, the contractor is required to provide site security in all contracts. These provisions include conforming to all OSHA requirements, lighting for night work, signs, traffic control, flagging, maintaining and/or providing fencing, temporary railing, and barricades.

1. Site security:

Fencing on each freeway project will change depending on the site conditions and the presence or absence of sound walls. Caltrans uses barbed wire fence, wire mesh fence and chain link fence. Barbed wire and wire mesh fences consist of five lines of barbed wire or wire mesh and three lines of barbed wire. Both types are fastened to metal posts or wood posts. The required fencing is specified in each contract. The contractor is required to maintain fencing and site security during the course of the contract and is responsible for preventing damage and repairing damaged features.

When the following conditions exist, the general contractor is required to install a temporary railing between any lane carrying public traffic and any excavation, obstacle or storage area:

a. Excavations. Any excavation near the edge that is 12 feet or less from the edge of the lane, except:

i. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.

ii. Excavations less than one foot deep.

iii. Trenches less than one foot wide for irrigation pipe or electrical conduit or excavations less than one foot in diameter.

iv. Excavations parallel to the lane for the purpose of pavement widening or reconstruction.

v. Excavations in side slopes, where the slope is steeper than 4:1.

b. Storage Areas. Whenever material or equipment is stored within 12 feet of the lane and such storage is not otherwise prohibited.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the work areas, the contractor must close the adjacent traffic lane unless otherwise provided in the specifications. These closures are based on traffic speed. When traffic speeds are over 45 miles per hour, as would be expected on a freeway, and work is within 6 feet of a traffic lane, the adjacent lane must be closed.

2. Inspection Schedule:

The Resident Engineer (RE) and her/his designated inspectors provide constant overview and authority on the following: all questions relating to the work performed, all questions that may arise as to the interpretation of the plans and specifications, and, all questions as to the acceptable fulfillment of the contract on the part of the contractor. Her/his decisions are final and she/he has the authority to enforce and make effective such decisions and orders that the contractor fails to carry out promptly. A project log is maintained by the RE detailing any decisions and/or variations from the contract requirements. Estimated quantities and location of ADL-contaminated soils will be recorded by the RE as part of the project documentation.

Before the start of work, the contractor designates in writing, an authorized representative who has the authority to act for the contractor. The representative must be present at the site of work at all times while work is actually in progress on the contract. When work is not in progress, or during periods when work is suspended, arrangements are made for any emergency work that may be required.

The Caltrans RE has, at all times, safe access to the work during its construction. All work done and all materials used are subject to her/his inspection. Projects financed in whole or part by Federal funds are subject to inspection at all times by the Federal agency involved.

3. Preparedness and Prevention Requirements:

a. Equipment:

For each contract, the contractor identifies each piece of equipment, other than hand tools, by means of an identifying number plainly stenciled or stamped on the equipment at a conspicuous location, and furnishes to the RE a list giving the description of each piece of equipment and its identifying number. The make, model number,

and empty gross weight of each unit of compacting equipment are stamped or stenciled on the unit. The gross weight is either the manufacturer's rated weight or the scale weight. All meters and scales are identified, rated, and marked.

Certain specifications may provide that equipment of a particular size and type is to be used to perform portions of the work. The contractor may request in writing, permission to use equipment of a different size or type in place of the equipment specified. The contractor may be required to furnish evidence the equipment proposed is capable of producing work equal to, or better than, that which can be produced by the equipment specified.

b. Communications:

Caltrans' vehicles are equipped with two-way radios with the radio base being the construction office. The radio is monitored by office personnel while vehicles are in the field.

c. Backup Contract:

Caltrans has a Construction Emergency Contract with 12 (this number will vary by year) contractors who are able to mobilize within 24 hours. This contract is available to perform right-of-way clearance of hazardous materials found during construction.

d. Prevention of Reaction of Ignitable, Reactive and Incompatible Wastes:

The contaminant of concern is aurally-deposited lead in soil. The lead appears to be present due predominately to vehicle emissions. Lead is non-reactive in this form. The presence of lead is determined prior to construction using a site investigation contract. If other elements or chemicals are suspected during this investigation, additional testing is done to identify and quantify these materials. Any soils identified as hazardous waste due to other elements or chemicals outside of those identified in the Agreement, will be managed and disposed of at a waste facility authorized to accept such waste.

If the contractor encounters unexpected materials that she/he suspects to be hazardous, the construction emergency contract can be used to investigate and identify constituents and concentrations. Removal and disposal of hazardous waste can be done by the construction emergency contractor.

e. Contingency Plan:

Contingencies to handle truck spills of soil with lead, dust control, erosion control, and unidentified waste have been discussed in previous sections.

f. Personnel Training and Safety:

Personnel training and safety are part of Caltrans' program and are required of the contractor in the special provisions of each contract. Caltrans has developed and provided training on the presence of lead in soil along the right-of-way to construction personnel. This class addressed the health risks associated with lead, the levels of lead present in soil next to the right-of-way, the personnel air monitoring conducted on contractor and Caltrans personnel and the monitoring results. Regulatory requirements and waste management issues unique to lead-contaminated soil were also addressed.

The Caltrans safety office develops policy and guidance for construction. The office has a Certified Industrial Hygienist on contract to provide air monitoring and assistance to the Districts in dealing with exposure to lead.

E. Contractors:

The Standard Specifications require that the contractor conform to all applicable occupational safety and health standards, rules, regulations, and orders established by the State of California. The special provisions of each contract provide a material handout to the contractor that gives the testing results for the contract area. The special provisions of each contract then list the Title 8, section 1532.1 requirements for health and safety related to construction projects with lead. The contractor is required to inform and train her/his personnel as required by this section. The contractor is required to develop a compliance plan, approved by a certified industrial hygienist, before beginning field work in areas with lead and submit this plan to the RE.

It is the contractor's responsibility to provide for the safety of traffic and the public during construction. In the

standard provisions, this requirement is traffic related. The special provisions of each contract require dust control and air monitoring to ensure that dust control measures are effective. Air monitoring is also conducted to meet project specific Air Quality Management District permit requirements.

ENVIRONMENTAL IMPACT ANALYSIS:

1. Aesthetics

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement to allow reuse of ADL-contaminated soil would be implemented within the right-of-way of State highways in urbanized and some rural areas where construction projects are planned to widen roads, add high occupancy vehicle lanes, change interchange configurations, construct sound walls, add Park & Ride facilities and install pumping plant facilities to control surface drainage. These are planned projects funded through local, state, and federal transportation improvement programs and are being constructed for traffic improvement and safety reasons.

The highway corridors are state-owned properties that are generally two to eight-lane concrete or asphalt paved corridors and are fenced for access control. Shoulders and median areas may be paved or composed of graded fill or native sedimentary materials. Materials underlying traveled lanes are generally composed of graded fill and base material aggregate for structural support.

Analysis as to Whether or Not Project Activities Would:

- a. Have a substantial adverse effect on a scenic vista.

Impact Analysis: The Agreement to allow reuse of ADL-contaminated soil is not anticipated to have significant impacts to scenic vistas as most projects are located within an existing right-of-way that includes a developed roadway. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a state scenic highway.

Impact Analysis: The Agreement to allow reuse of ADL-contaminated soil is not anticipated to have significant impacts to scenic resources as most projects are located within an existing right-of-way that includes a developed roadway. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- c. Substantially degrade the existing visual character or quality of the site and its surroundings.

Impact Analysis: The Agreement to allow reuse of ADL-contaminated soil is not anticipated to have significant impacts to the existing visual character as most projects are located within an existing right-of-way that includes a developed roadway. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- d. Create a new source of substantial light of glare that would adversely affect day or nighttime views in the area.

Impact Analysis: The Agreement to allow reuse of ADL-contaminated soil is not anticipated to create new sources of substantial light glare. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

2. Agricultural Resources

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement to allow reuse of ADL-contaminated soil would be implemented within the right-of-way of State highways in urbanized and some rural areas where construction projects are planned to widen roads, add high occupancy vehicle lanes, change interchange configurations, construct sound walls, add Park & Ride facilities and install pumping plant facilities to control surface drainage. These are planned projects funded through local, state, and federal transportation improvement programs and are being constructed for traffic improvement and safety reasons.

Analysis as to Whether or Not Project Activities Would:

- a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.

Impact Analysis: The Agreement to allow reuse of ADL-contaminated soil is not anticipated to impact agricultural resources as no activities will be conducted under this Agreement. In addition, most reuse projects are located within an existing right-of-way that includes a developed roadway. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Conflict with existing zoning for agriculture use, or Williamson Act contract.

Impact Analysis: The Agreement to allow reuse of ADL-contaminated soil is not anticipated to conflict with existing zoning for agriculture use, or Williamson Act contract, since no activities will be conducted under this Agreement. In addition, most reuse projects are located within an existing right-of-way that includes a developed roadway and these projects will not be located on agricultural properties. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural uses.

Impact Analysis: The Agreement to allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans will not result in the conversion of Farmland to non-agricultural uses since these projects will not be located on agricultural properties.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

3. Air Quality

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: Dust control measures will be implemented during earthwork activities. Dust will be controlled by water or dust palliative or both. When vehicles are loaded, no soil will extend above the sides or rear of the vehicle. Refer also to environmental impact item Hazards and Hazardous Materials.

Standard construction contract provisions direct the contractor to meet dust control requirements. In accordance with the Agreement, Caltrans projects will also be subject to local Air Quality Management Districts' regulations to control dust emissions.

Analysis as to Whether or Not Project Activities Would:

- a. Conflict with or obstruct implementation of the applicable air quality plan.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will conflict with or obstruct implementation of an applicable air quality plan. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase. In addition, there are no anticipated significant impacts to air quality because the dust control measures outlined in the Agreement will ensure that there are no substantive changes to air quality.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil violate any air quality standard or contribute substantially to an existing or projected air quality violation. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase. There are no anticipated significant impacts to air quality because the dust control measures outlined in the Agreement will ensure that there are no substantive changes to air quality.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- c. Result in cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will create any cumulative impact to ambient air quality standards. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase. There are no anticipated significant impacts to air quality because the dust control measures outlined in the Agreement will ensure that there are no substantive changes to air quality.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

d. Expose sensitive receptors to substantial pollutant concentrations.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will impact any sensitive receptors. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase. Although it is unknown whether there will be sensitive receptors near the reuse areas; there are no anticipated significant impacts to air quality because the dust control measures outlined in the Agreement will ensure that there are no substantive changes to air quality.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

e. Create objectionable odors affecting a substantial number of people.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil, which is not anticipated to create objectionable odors. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

f. Result in human exposure to Naturally Occurring Asbestos.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. It is not anticipated that these areas will contain Naturally Occurring Asbestos. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

4. Biological Resources

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement to allow reuse of ADL-contaminated soil would be implemented within the right-of-way of State highways in urbanized and some rural areas where construction projects are

planned to widen roads, add high occupancy vehicle lanes, change interchange configurations, construct sound walls, add Park & Ride facilities and install pumping plant facilities to control surface drainage.

Analysis as to Whether or Not Project Activities Would:

- a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

Impact Analysis: Allowing reuse of the ADL-contaminated soil is not anticipated to directly result in impacts to biological resources for these projects. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

Impact Analysis: Allowing reuse of the ADL-contaminated soil is not anticipated to directly result in impacts to any riparian habitat or other sensitive natural communities. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

Impact Analysis: Allowing reuse of the ADL-contaminated soil is not anticipated to directly result in impacts to federally protected wetlands. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Impact Analysis: Allowing reuse of the ADL-contaminated soil will not directly result in impacts to the movement of species, or impede the use of native wildlife nursery sites. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- e. Conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Impact Analysis: Allowing reuse of the ADL-contaminated soil will not directly conflict with local policies or ordinances protecting biological resources. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Impact Analysis: Allowing reuse of the ADL-contaminated soil is not anticipated to directly result in conflicts with a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved habitat conservation plan. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

5. Cultural Resources

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement to allow reuse of ADL-contaminated soil would be implemented within the right-of-way of State highways. The areas containing ADL-contaminated soil are located along existing roads and generally contain soil that has been highly disturbed.

Analysis as to Whether or Not Project Activities Would:

- a. Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. Allowing reuse of the ADL-contaminated soil will not in itself directly impact any historical resources. Any potential impacts to historical resources would be related to the actual excavation/transportation of the contaminated soil, which would not occur until Caltrans initiates a project at a specific location. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Cause a substantial adverse change in the significance of an archeological resource pursuant to 15064.5.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. Allowing reuse of the ADL-contaminated soil will not in itself directly impact archeological resources. Any potential impacts to archeological resources would be related to the actual excavation/transportation of the contaminated soil, which would not occur until Caltrans initiates a project at a specific location. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

In accordance with AB52, the DTSC began consultations on February 12, 2015 by sending an outreach letter to the United Auburn Indian Community of the Auburn Rancheria, which is the only California Native American tribe that has provided written notice requesting consultation on the presence of Tribal Cultural Resources (TRC) within the State. As of March 14, 2016, no response had been received.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. Allowing reuse of the ADL-contaminated soil will not in itself directly impact any unique paleontological resource or site resources or unique geologic features. Any potential impacts to archeological resources would be related to the actual excavation/transportation of the contaminated soil, which would not occur until Caltrans initiates a project at a specific location. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- d. Disturb any human remains, including those interred outside of formal cemeteries.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. Allowing reuse of the ADL-contaminated soil will not in itself directly impact any human remains. . Any potential impacts to archeological resources would be related to the actual excavation/transportation of the contaminated soil, which would not occur until Caltrans initiates a project at a specific location. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

6. Geology and Soils

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement would be implemented within the right-of-way of State highways in urbanized and some rural areas where construction projects are planned to widen roads, add high occupancy vehicle lanes, change interchange configurations, construct sound walls, add Park & Ride facilities and install pumping plant facilities to control surface drainage. These are planned projects funded through local, State, and federal transportation improvement programs and are being constructed for traffic improvement and safety reasons.

The highway corridors are state-owned properties that are generally two to eight-lane concrete or asphalt paved corridors and are fenced for access control. Shoulders and median areas may be paved or composed of graded fill or native sedimentary materials. Materials underlying traveled lanes are generally composed of graded fill and base material aggregate for structural support.

Surface drainage is controlled by sloping of lanes to direct rain runoff to medians, shoulders, and then drain inlets or side ditches. Drainage control is necessary to prevent damage to the pavement structure and for safety purposes. Drainage inlets may lead to pumping plants that lift water to storm drains or directly into storm drains. For parking lots, drainage is

directed to drainage inlets. Drainage inlets are grated to prevent entry and keep trash and debris out as much as possible.

Analysis as to Whether or Not Project Activities Would:

a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

- ❖ Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. (Refer to Division of Mines and Geology Special Publication 42).
- ❖ Strong seismic ground shaking.
- ❖ Seismic-related ground failure, including liquefaction.
- ❖ Landslides.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans and will not directly expose people or structures to effects related to rupture of a known earthquake fault, seismic ground shaking, seismic-related ground failure, or landslides. Any possible impacts to these resources related to excavation of the soil will be subject to analysis under CEQA when each individual project is proposed.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

b. Result in substantial soil erosion or the loss of topsoil.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans and will not directly result in erosion or loss of topsoil. As specified in the Agreement, dirt and erosion control measures will be implemented during earthwork activities. Caltrans will require the contractor to install permanent erosion control features concurrently with or immediately following grading and or placement operations. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans and will not directly impact any geologic unit or soil. As specified in the Agreement, dirt and erosion control measures will be implemented during earthwork activities. Caltrans will require the contractor to install permanent erosion control features concurrently with or immediately following grading and or placement operations. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil would directly create any risks related to expansive soil. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans and does not include the construction of septic tanks or alternative wastewater disposal systems.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

7. Greenhouse Gas Emissions

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The regulatory setting for air quality in California is overseen by federal, state, and local agencies. These agencies either have actual regulatory authority or are responsible for the development and implementation of programs and plans designed to reduce air pollution levels. The Clean Air Act (CAA) of 1970, as amended, serves as the legal basis for air quality policy and regulations at the federal level. Pursuant to this Act, the United States Environmental Protection Agency (USEPA) establishes and periodically updates National Ambient Air Quality Standards (NAAQS). The NAAQS represent the maximum allowable atmospheric concentrations for seven "criteria" pollutants: ozone, nitrogen dioxide (NO₂), carbon monoxide (CO), particulate matter less than 10 microns in aerodynamic diameter (PM₁₀), particulate matter less than 2.5 microns in aerodynamic diameter (PM_{2.5}), sulfur dioxide (SO₂), and lead.

At state level, the California Air Resources Board (ARB) oversees California air quality policies and regulations. The ARB initially established California ambient air quality standards (CAAQS) in 1969. These state standards are generally more stringent and include more pollutants than the NAAQS, and include four additional pollutants of concern: sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulates. A project must not result in air pollutant emissions that would cause or contribute to exceedances of the NAAQS or CAAQS.

Analysis as to Whether or Not Project Activities Would:

- a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans and will not generate greenhouse gas emissions. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. It is not anticipated that reuse of ADL-contaminated soil will create any impacts. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

8. Hazards and Hazardous Materials

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement will allow Caltrans to excavate, stockpile, transport, and reuse ADL- contaminated soil on transportation projects within State-owned existing highway right-of-way. The soil management requirements in the Agreement use a health based risk criteria and vary depending on lead concentration from no restrictions to mandatory placement under concrete. ADL-contaminated soils with a lead concentration above the maximums specified in the Agreement are not eligible to be managed under the Agreement and are subject to full regulation as hazardous waste.

The presence of lead will be determined prior to construction using a site investigation contract. If other elements or chemicals are suspected during this investigation, additional testing is done to identify and quantify these materials. Any soils identified as hazardous waste due to elements or compounds other than lead will be managed and disposed of at a waste facility authorized to accept such waste.

If the contractor encounters unexpected materials that she/he suspects are hazardous, the construction emergency contract can be used to investigate and identify constituents and concentrations. Removal and disposal of hazardous waste must be done by the construction emergency contractor.

Contingency plans are required to handle truck spills of ADL-contaminated soil, control dust and erosion, and properly deal with unidentified waste as discussed in the Agreement and also under environmental impact items Air Quality and Geology/Soil.

Analysis as to Whether or Not Project Activities Would:

- a. Create a significant hazard to the public or the environment throughout the routine transport, use or disposal of hazardous materials.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil would have any significant effects on the environment. Soils allowed to be reused will generally be kept on-site, so there would be little, if any, transport. In accordance with the Agreement, management activities, operation plans, an inspection program, emergency plans, and employee training requirements help ensure safe conditions during operations. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil would have any significant effects on the environment. Management activities, operation plans, an inspection program, emergency plans, and employee training requirements help ensure safe conditions during operations. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school.

Impact Analysis: It is unknown if future projects will be located within one-quarter mile of a school. The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil would have any significant effects on the environment; however, each individual project will undergo a specific environmental review during that project's approval phase. Management activities, operation plans, an inspection program, emergency plans, and employee training requirements help ensure safe conditions during operations. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to public or the environment.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil within an existing right-of-way would occur on a site that is included on the referenced list of hazardous materials sites. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- e. Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil would impact an adopted emergency response plan or emergency evacuation plan. Each individual project carried

out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

9. Hydrology and Water Quality

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The excavation or placement of ADL-contaminated soil will take place within existing highway right-of-way.

Lead is relatively insoluble in soils at near-neutral pH levels. Sampling by Caltrans has found pH levels of 6 to 8 in roadside soil, which are near neutral pH levels. While the lead is in soil, it possesses physical and chemical characteristics that render it insignificant as a hazard to human health and safety. When it leaches out into water, however, it may have certain adverse effects. Therefore, the Agreement contains conditions that requires Caltrans to comply with all requirements of the State Water Resources Board and the Regional Water Quality Control Board where each specific project is located to ensure groundwater and surface water protection.

Analysis as to Whether or Not Project Activities Would:

- a. Violate any water quality standards or waste discharge requirements.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase. There are no anticipated significant impacts to surface and groundwater other than those mentioned above and these impacts will be evaluated during the project-specific environmental review. Additionally, Caltrans will be required to notify the State Water Resources Control Board and/or a California Regional Water Quality Control Board before soil is managed pursuant to this Agreement. Finally, the Agreement will require Caltrans and any future owners to conduct a number of long-term maintenance measures, such as inspecting and maintaining cover over the lead contaminated soil to ensure that it does not impact the groundwater.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficient in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase. There are no anticipated significant impacts to groundwater supplies or recharge. Additionally, Caltrans will be required to notify the State Water Resources Control Board and/or a California Regional Water Quality Control Board before soil is managed pursuant to this Agreement.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off-site.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase. Additionally, Caltrans will be required to notify the State Water Resources Control Board and/or a California Regional Water Quality Control Board before soil is managed pursuant to this Agreement. Finally, the Agreement will require Caltrans and any future owners to conduct a number of long-term maintenance measures, such as inspecting and maintaining cover over the lead contaminated soil.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off-site.

Impact Analysis: It is not anticipated that the reuse of ADL-contaminated soil would directly alter the drainage patterns. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase. Additionally, Caltrans will be required to notify the State Water Resources Control Board and/or a California Regional Water Quality Control Board before soil is managed pursuant to this Agreement. Finally, the Agreement will require Caltrans and any future owners to conduct a number of long-term maintenance measures, such as inspecting and maintaining cover over the lead contaminated soil.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- e. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase. It is not anticipated that the reuse of ADL-contaminated soil would directly create or contribute runoff water. Caltrans will be required to notify the State Water Resources Control Board and/or a California Regional Water Quality Control Board before soil is managed pursuant to this Agreement.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- f. Otherwise substantially degrade water quality.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase. It is not anticipated that the reuse of ADL-contaminated soil will degrade water quality. Additionally, Caltrans will be required to notify the State Water Resources Control Board and/or a California Regional Water Quality Control Board before soil is managed pursuant to this Agreement. Finally, the Agreement will require Caltrans and any future owners to conduct a number of long-term maintenance measures, such as inspecting and maintaining cover over the lead contaminated soil.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- g. Place within a 100-flood hazard area structures which would impede or redirect flood flows.

Impact Analysis:

The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase. Additionally, Caltrans will be required to notify the State Water Resources Control Board and/or a California Regional Water Quality Control Board before soil is managed pursuant to this Agreement.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- h. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- i. Inundation by sieche, tsunami or mudflow.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil would create the potential for impacts by sieche, tsunami, and mudflow. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

10. Land Use and Planning

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. There are no land use or planning changes associated with the Project.

Analysis as to Whether or Not Project Activities Would:

- a. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. There are no anticipated significant effects or changes to land use or planning as a result of this Agreement.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Conflict with any applicable habitat conservation plan or natural community conservation plan.

Impact Analysis: Allowing reuse of the ADL-contaminated soil, or allowing it to remain in place, is not anticipated to directly result in conflicts with a habitat conservation plan or natural community conservation plan. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

11. Mineral Resources

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans.

Analysis as to Whether or Not Project Activities Would:

- a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

Impact Analysis: This project will not result in use of any mineral resources. There are no anticipated significant impacts to mineral resources.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. This project will not result in use of any mineral resources. There are no anticipated significant impacts to mineral resources.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

12. Noise

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The construction activities would temporarily generate noise. The contractor would be required to comply with all local noise control regulations and ordinances. Additionally, each transportation project will be constructed in conformance with the appropriate local general plan noise elements. The Agreement will not impact the normal excavation and soil transportation work activities associated with the highway project. Prior to the construction of the individual projects, all sensitive noise receptors will be identified and noise measurements will be taken at the most representative sites.

Feasible and reasonable noise mitigation will be considered for all locations for which the predicted noise levels approach or exceed the noise abatement criteria of 67 dBA (Leq), specified by the U.S. Federal Highway Administration as the maximum allowable noise level for residential areas. Mitigation will be in accordance with the Caltrans Highway Design Manual (Chapter 1100) and the U.S. Federal Highway Administration noise abatement procedures as provided in the Code of Federal Regulations (23 CFR 772).

Analysis as to Whether or Not Project Activities Would:

- a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-way for various projects undertaken by Caltrans. The Agreement will not increase noise levels above normal highway construction levels that would occur if the lead-contaminated soil was not reused. The reuse of ADL-contaminated soil may create less noise than that which would be generated from vehicles hauling ADL-contaminated soil to a Class I landfill. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Exposure of persons to or generation of excessive groundbourne vibration or groundbourne noise levels.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will increase groundbourne vibration or noise levels; however, each individual project will undergo a specific environmental review during that project's approval phase, the same as any other Caltrans project. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- c. A substantial permanent increase in ambient noise levels in the vicinity above levels existing without the project.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will create a substantial permanent increase in ambient noise levels; however, each individual project will undergo a specific environmental review during that project's approval phase, the same as any other Caltrans project. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will create a substantial permanent increase in ambient noise levels; however, each individual project will undergo a specific environmental review during that project's approval phase, the same as any other Caltrans project. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

13. Population and Housing

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement would be implemented within the right-of-way of State highways in urbanized and some rural areas where construction projects are planned to widen roads, add high occupancy vehicle lanes, change interchange configurations, construct sound walls, add Park & Ride facilities and install pumping plant facilities to control surface drainage.

Analysis as to Whether or Not Project Activities Would:

- a. Induce substantial population growth in area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).

Impact Analysis: No impacts on population associated with the approval of the Agreement are anticipated. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

Impact Analysis: No impacts on housing needs associated with the approval of the Agreement are foreseen.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will

displace substantial numbers of people. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

14. Public Services

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement will allow Caltrans to use ADL-contaminated soil on road projects within specified corridors within state owned highway right-of-way.

Analysis as to Whether or Not Project Activities Would:

- a. Result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:

- ❖ Fire protection
- ❖ Police protection
- ❖ Schools
- ❖ Parks
- ❖ Other public facilities

Impact Analysis: The reuse of ADL-contaminated soil will not have an effect upon or result in a need for new or altered governmental services so there are no significant impacts to public services.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

15. Recreation

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The project consists of the reuse of ADL-contaminated soil during construction activities on existing, state owned right-of-way for the Caltrans. No changes to existing right-of-way that would impact local needs for recreation are being proposed.

Analysis as to Whether or Not Project Activities Would:

- a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

Impact Analysis: No new recreation needs associated with the approval of the Agreement are anticipated.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Include recreational facilities or require construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Impact Analysis: Reuse of ADL-contaminated soil within existing right-of-ways will not include recreational facilities, nor require construction or expansion of facilities.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

16. Transportation and Traffic

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement would apply to the management of ADL-contaminated soil within individual projects in highway and freeway corridors where construction projects will be completed to widen roads, add lanes, change interchange configurations, add Park & Ride facilities, and install pumping plant facilities to control surface drainage. These projects are part of the State Transportation Improvement Program or other transportation funding programs and are being conducted for traffic improvement and safety reasons.

The Agreement would apply to two general categories of soil reuse in Caltrans projects. These activities would temporarily add truck traffic to an existing highway. In the first category, the need for fill soil is balanced by the amount of soil to be excavated. The project design shows where soil will be excavated and where it will be placed. Placement of fill would occur in embankments, interchanges, structural backfill, raised grades under Park & Ride lots, and under paved lanes or shoulders.

The second category of projects is those jobs where soil must be imported from outside the project boundaries, but within the highway corridor or connecting corridor. New interchange projects or improvements to large interchanges may need several thousand cubic yards of soil. Soil from many areas may be moved to a single location. Soil may also be moved to interchanges where space with restricted access is available to place extra soil.

Analysis as to Whether or Not Project Activities Would:

- a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections).

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will create significant impacts to transportation or circulation. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Exceed, either individually or cumulatively, a level of service standard established by the country congestion management agency for designated roads or highway.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will impact the level of service create a substantial permanent increase in ambient noise levels. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- c. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will increase hazards due to a design feature or incompatible uses. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- d. Result in inadequate emergency access.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will create a substantial permanent increase in ambient noise levels. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- e. Result in inadequate parking capacity.

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will impact parking capacity. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- f. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

Impact Analysis: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans. It is not anticipated that the reuse of ADL-contaminated soil will

conflict with alternative transportation policies, plans, or programs. Each individual project carried out by Caltrans will undergo a specific environmental review in accordance with CEQA during that project's approval phase.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

17. Utilities and Service Systems

Project Activities Likely to Create an Impact: None

Description of Baseline Environmental Conditions: The Agreement will allow reuse of ADL-contaminated soil within existing State-owned highway right-of-ways for various projects undertaken by Caltrans and will not result in the need for new systems or substantial alteration to any utilities. The Agreement will be used on freeway corridors where construction projects will be completed to widen roads, add high occupancy vehicle lanes, change interchange configurations, add Park & Ride facilities and install pumping plant facilities to control surface drainage.

Analysis as to Whether or Not Project Activities Would:

- a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

Impact Analysis: Because the reuse of ADL-contaminated soil will not require wastewater treatment, there will be no impact.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Impact Analysis: Because the reuse of ADL-contaminated soil will not require the construction or expansion of water or wastewater treatment facilities, there will be no impact.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Impact Analysis: The reuse of ADL-contaminated soil will not require the construction or expansion of new storm water drainage facilities, there will be no impact.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed.

Impact Analysis: Because the reuse of ADL-contaminated soil will not require the additional water supplies; therefore, there are will be no impact.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- e. Result in determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments.

Impact Analysis: Because the reuse of ADL-contaminated soil will not increase wastewater, it will not require the development of additional utilities; therefore, there will be no impacts.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- f. Be served by a landfill with sufficient permitted capacity to accommodate the projects solid waste disposal needs.

Impact Analysis: Because the reuse of ADL-contaminated soil will not require the development of additional utilities, there are no significant impacts.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

- g. Comply with federal, state, and local statutes and regulations related to solid waste.

Impact Analysis: Because the reuse of ADL-contaminated soil will not produce solid waste, there are no significant impacts.

Conclusion:

- Potentially Significant Impact
 Potentially Significant Unless Mitigated
 Less Than Significant Impact
 No Impact

Mandatory Findings of Significance

Based on evidence provided in this Initial Study, DTSC makes the following findings:

- a. The project has does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.
- b. The project has does not have impacts that are individually limited but cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.
- c. The project has does not have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly.

Determination of Appropriate Environmental Document:

Based on evidence provided in this Initial Study, DTSC makes the following determination:

- The proposed project COULD NOT HAVE a significant effect on the environment. A **Negative Declaration** will be prepared.
- The proposed project COULD HAVE a significant effect on the environment. However, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A **Mitigated Negative Declaration** will be prepared.
- The proposed project MAY HAVE a significant effect on the environment. An **Environmental Impact Report** is required.
- The proposed project MAY HAVE a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An **Environmental Impact Report** is required, but it must analyze only the effects that remain to be addressed.
- The proposed project COULD HAVE a significant effect on the environment. However, all potentially significant effects (a) have been analyzed adequately in an earlier Environmental Impact Report or Negative Declaration pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier Environmental Impact Report or Negative Declaration, including revisions or mitigation measures that are imposed upon the proposed project. Therefore, nothing further is required.

Certification:

I hereby certify that the statements furnished above and in the attached exhibits, present the data and information required for this initial study evaluation to the best of my ability and that the facts, statements and information presented are true and correct to the best of my knowledge and belief.

 _____ Preparer's Signature	March 21, 2016 _____ Date	
Perry Myers _____ Preparer's Name	Sr. Hazardous Substances Engineer _____ Preparer's Title	(916)255-3708 _____ Phone #

 _____ Branch or Unit Chief Signature	March 21, 2016 _____ Date	
Daniel T. Ward, P.E. _____ Branch or Unit Chief Name	Chief, Engineering and Special Projects Branch _____ Branch or Unit Chief Title	(916)255-3676 _____ Phone #

ATTACHEMENT A

REFERENCES

The Agreement was used as a reference for all of the sections.

Perry Myers
February 9, 2016

According to Caltrans¹, their maintenance crews perform a variety of activities involving contact with soil. In districts with a high number of highway miles there are several different types of crews including sign crews, landscape crews, bridge crews, and guardrail crews. In districts with fewer highway miles general crews do this work. The estimates that regardless of the crew type an average of 2 hours out of each 8 hour working day is spent in direct contact with the soil.

Although we were unable to find studies evaluating hitchhikers exposure to soil or dust, or how long they were exposed to either, there were a few studies that evaluated the odds of being picked up by a driver. The lowest value that we found was 6.9%². If we assume that the majority of hitchhikers are active during the day then it would seem that a hitchhiker would rarely be in the same spot for more than an hour. We also assumed that they would not be digging in the soil or otherwise have an exposure greater than a Caltrans worker. We made this same assumption for other persons who are not Caltrans workers, and who may be briefly on a Caltrans right-of-way.

The value of 320 mg lead/kg of soil was developed by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) and is the California Human Health Screening Level (CHSSL) for lead for an adult worker. It was developed using USEPA's Adult Lead Model (ALM) which produces an estimate of the maximum allowable total lead concentration in soil that would result in a 90th percentile estimate of blood lead in the fetus of an adult worker equal to an increase of 1 ug lead/dL of blood, for an exposure of 250 days per year, which is considered a yearly exposure for a worker.

We recommend that the exposure point concentration of the appropriate exposure area for the right-of-way soil be evaluated by using a 95% Upper Confidence Limit (UCL) on the arithmetic mean (e.g., 95%UCL concentration vs. 320 mg/kg).

The value of 320 mg/kg is only for the Caltrans worker and others with intermittent exposure to the soil along Caltrans right-of-ways. It should not be used for other types of exposures such as trying to determine whether the soil is safe for use at residences, gardens, parks, playgrounds, other types of Caltrans sites, or for hazardous waste determination.

It should also be noted that Caltrans has and follows safe operating practices specifically for lead in soil¹. This includes workers wearing coveralls which are removed after field activities, collected at the maintenance station and laundered by a commercial service. In addition, their maintenance trucks are equipped with water, soap, and towels so that workers may wash their hands before eating or smoking.

References

- 1) Caltrans 2015 – Personal communication with Kim Christmann, Senior Engineering Geologist with CalTrans October 28-29.

Perry Myers
February 9, 2016

- 2) Bulletin of the Psychonomic Society 1975 vol 5(6) 459-61. Hitchhiking: Social Signals at a Distance. CJ Morgan et al.

Summary

A concentration of lead not to exceed 320 mg of aerially deposited lead per kg of soil is considered protective of Caltrans maintenance workers and others, as mentioned above, who have intermittent exposure to aerially deposited lead in soil along Caltrans right-of-ways. We also recommend that Caltrans adhere to an industrial hygiene program and follow applicable guidelines and regulations.

Please call (916) 255-6628 or e-mail me (Thomas.Booze@dtsc.ca.gov) if you have questions regarding our recommendations.



Reviewed by: Claudio Sorrentino, Ph.D.
Senior Toxicologist
Human and Ecological Risk Office



Alan C. Lloyd, Ph.D.
Agency Secretary
Cal/EPA



Department of Toxic Substances Control

8810 Cal Center Drive
Sacramento, California 95826-3200



Arnold
Schwarzenegger
Governor

MEMORANDUM

TO: Mr. David A. Wright, Chief
Permit Program Development Section
Hazardous Waste Management Program
1101 I Street, 12th Floor
Sacramento, California 95814

FROM: David L. Berry, Ph.D. *David L. Berry*
Senior Toxicologist
Human and Ecological Risk Division (HERD)
8810 Cal Center Drive, 2nd Floor
Sacramento, CA 95826-3200

DATE: August 25, 2005

SUBJECT: Review of the CalTrans Variance for Lead Contaminated Soil
Management and Disposal

As requested, the Human and Ecological Risk Division (HERD) reviewed the August 14, 2001 memorandum from Stephen M. DiZio Ph.D. and the October 6, 1994 memorandum from James C. Carlisle, DVM concerning the existing variance granted to CalTrans for soil management of lead contaminated soils. The variance conditions developed for CalTrans addressed two levels of contamination as follows.

1. Hazardous soils containing less than 1575 mg/kg total lead and less than 500 µg/l of deionized-water-extractable lead could be re-used on CalTrans sites provided that there were at least two feet above the water table and covered by at least one foot of non-hazardous soil.
2. Hazardous soils containing less than 4150 mg/kg total lead and more than 500 µg/l of deionized-water-extractable lead could be re-used on CalTrans sites provided that there were at least two feet above the water table and covered by an impermeable cover such as a pavement structure or at least one foot of compacted clay.

HERD based these numbers on a Lead Risk Assessment Spreadsheet [LeadSpread] which was the basis for the October 6, 1994 memorandum. The modeled soil lead

EXHIBIT 2

David A. Wright, P.E.
August 25, 2005
Page 2

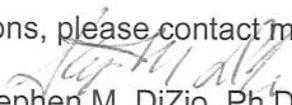
values were developed based on changing environmental concentrations of lead as well as changing state of science concerning physiological and behavioral parameters that determine exposures to environmental media such as soil. The blood lead level of concern has not changed in the eleven years since the original memorandum.

Using the latest information and the current LeadSpread model [LeadSpread 7], HERD would calculate the 95th percentile estimates of the maximum allowable total lead concentration of 1411 mg/kg for the first scenario and 3397 mg/kg for the second scenario. These estimates are for adults only. Spreadsheets showing these calculations are attached.

The newly estimated values do not differ significantly from the limits specified in the original variance. This opinion is based on (1) the general uncertainty in modeling exposure, and (2) the fact that the atmospheric lead concentrations used in the model are unrealistically high, in view of the decreasing atmospheric lead concentrations throughout California. The default atmospheric lead concentration value of $1.58 \mu\text{g}/\text{m}^3$ used in the spreadsheet in the 1994, 2001, and current attachment is 56 times greater than the highest annual average atmospheric lead concentration reported at any monitoring station in California in 1997, the latest year for which we have complete data. Reducing the assumed atmospheric lead concentration to $1.15 \mu\text{g}/\text{m}^3$ [still greater than current ambient levels as measured by the California Air Resources Board] would raise the lead soil limits for the two scenarios to the levels specified in the 1994 variance. From a scientific and technical point of view, the original variance conditions remain health-protective.

Concerning the conclusions in the 1994 memorandum [and the 2001 memorandum] about the deionized-water-extractable lead, distances from the water table, and nature of soil cover over the contaminated soil, HERD no longer possesses the resources to determine whether such parameters as are specified in the 1994 memorandum are representative of current groundwater protection. HERD recommends that any re-evaluation of Dr. Carlisle's 1994 conclusions be conducted by the Geological Services Branch within the Hazardous Waste Management Program.

If you have any questions, please contact me at 916-255-6626.

Reviewed by: 
Stephen M. DiZio, Ph.D.
Division Chief, Human and Ecological Risk Division

LEAD RISK ASSESSMENT SPREADSHEET

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

USER'S GUIDE to version 7

INPUT	
MEDIUM	LEVEL
Lead in Air (ug/m ³)	1.58
(ug/g)	3397.0
Lead in Water (ug/l)	10
% Home-grown Produ	0%
(ug/m ³)	0

OUTPUT								
	Percentile Estimate of Blood Pb (ug/dl)					PRG-99	PRG-95	
	50th	90th	95th	98th	99th	(ug/g)	(ug/g)	
BLOOD Pb, ADULT	18.7	34.1	40.3	49.0	55.8	-9	276	
BLOOD Pb, CHILD	27.3	50.0	59.1	71.8	81.8	14	195	
BLOOD Pb, PICA CHILD	51.3	93.6	110.8	134.7	153.2	7	98	
BLOOD Pb, OCCUPATIC	4.6	8.5	10.0	12.2	13.8	2069	3397	

EXPOSURE PARAMETERS			
	units	adults	children
Days per week	days/wk	7	
Days per week, occupational		1.5	
Geometric Standard Deviation		1.6	
Blood lead level of concern (ug/		10	
Skin area, residential	cm ²	####	####
Skin area occupational	cm ²	####	
Soil adherence	ug/cm ²	500	200
Dermal uptake consta	(ug/dl)/(ug/	0.0001	
Soil ingestion	mg/day	240	100
Soil ingestion, pica	mg/day		200
Ingestion constant	(ug/dl)/(ug/	0	0.2
Bioavailability	unitless	0.44	
Breathing rate	m ³ /day	20	6.8
Inhalation constant	(ug/dl)/(ug/	0.1	0.2
Water ingestion	l/day	1.4	0.4
Food ingestion	kg/day	1.9	1.1
Lead in market basket	ug/kg	3.1	
Lead in home-grown produc	ug/kg	1528.7	

PATHWAYS							
ADULTS	Residential			Occupational			
	Pathway contribution			Pathway contribution			
	Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	2.7E-4	0.93	5%	6.0E-5	0.20	4%	
Soil Ingestion	4.2E-3	####	77%	9.1E-4	3.07	66%	
Inhalation, bkgrnd		2.59	14%		0.56	12%	
Inhalation	0.0E+0	0.00	0%	0.0E+0	0.00	0%	
Water Ingestion		0.56	3%		0.56	12%	
Food Ingestion, bkgrnd		0.23	1%		0.23	5%	
Food Ingestion	0.0E+0	0.00	0%			0%	

CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
	Pathway	PEF	ug/dl	percent	PEF	ug/dl
Soil Contact	5.6E-5	0.19	1%		0.19	0%
Soil Ingestion	7.0E-3	####	87%	1.4E-2	47.83	93%
Inhalation	0.0E+0	0.00	0%		0.00	0%
Inhalation, bkgrnd		2.06	8%		2.06	4%
Water Ingestion		0.64	2%		0.64	1%
Food Ingestion, bkgrnd		0.54	2%		0.54	1%
Food Ingestion	0.0E+0	0.00	0%		0.00	0%

Click here for REFERENCES

LEAD RISK ASSESSMENT SPREADSHEET

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

USER'S GUIDE to version 7

INPUT	
MEDIUM	LEVEL
Lead in Air (ug/m ³)	1.58
(ug/g)	1411.0
Lead in Water (ug/l)	10
% Home-grown Produ	0%
(ug/m ³)	0

OUTPUT							
	Percentile Estimate of Blood Pb (ug/dl)					PRG-99	PRG-95
	50th	90th	95th	98th	99th	(ug/g)	(ug/g)
BLOOD Pb, ADULT	9.7	17.8	21.0	25.6	29.1	-9	276
BLOOD Pb, CHILD	13.3	24.2	28.7	34.8	39.6	14	195
BLOOD Pb, PICA CHILD	23.2	42.4	50.1	60.9	69.3	7	98
BLOOD Pb, OCCUPATIC	4.6	8.5	10.0	12.2	13.8	747	1411

EXPOSURE PARAMETERS

	units	adults	children
Days per week	days/wk	7	
Days per week, occupational		3	
Geometric Standard Deviation		1.6	
Blood lead level of concern (ug/		10	
Skin area, residential	cm ²	####	####
Skin area occupational	cm ²	####	
Soil adherence	ug/cm ²	500	200
Dermal uptake constant	(ug/dl)/(ug/	0.0001	
Soil ingestion	mg/day	240	100
Soil ingestion, pica	mg/day		200
Ingestion constant	(ug/dl)/(ug/	0	0.2
Bioavailability	unitless	0.44	
Breathing rate	m ³ /day	20	6.8
Inhalation constant	(ug/dl)/(ug/	0.1	0.2
Water ingestion	l/day	1.4	0.4
Food ingestion	kg/day	1.9	1.1
Lead in market basket	ug/kg	3.1	
Lead in home-grown product	ug/kg	635.0	

PATHWAYS

ADULTS	Residential			Occupational		
	Pathway contribution			Pathway contribution		
	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	2.7E-4	0.39	4%	1.2E-4	0.17	4%
Soil Ingestion	4.2E-3	5.96	61%	1.8E-3	2.55	55%
Inhalation, bkgrnd		2.59	27%		1.11	24%
Inhalation	0.0E+0	0.00	0%	0.0E+0	0.00	0%
Water Ingestion		0.56	6%		0.56	12%
Food Ingestion, bkgrnd		0.23	2%		0.23	5%
Food Ingestion	0.0E+0	0.00	0%			0%

CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	5.6E-5	0.08	1%		0.08	0%
Soil Ingestion	7.0E-3	9.93	75%	1.4E-2	19.87	86%
Inhalation	0.0E+0	0.00	0%		0.00	0%
Inhalation, bkgrnd		2.06	16%		2.06	9%
Water Ingestion		0.64	5%		0.64	3%
Food Ingestion, bkgrnd		0.54	4%		0.54	2%
Food Ingestion	0.0E+0	0.00	0%		0.00	0%

[Click here for REFERENCES](#)



Department of Toxic Substances Control

Maziar Movassaghi, Acting Director
5796 Corporate Avenue
Cypress, California 90630



Arnold Schwarzenegger
Governor



Linda S. Adams
Secretary for
Environmental
Protection

MEMORANDUM

TO: Wayne Lorentzen
Hazardous Substances Engineer
Brownfields and Environmental Restoration Program

FROM: Wendy W. Arano, PG *Wendy W. Arano*
Engineering Geologist
Geological Services Unit -Cypress

Alfredo Zanoria, CEG, CHG *Alfredo Zanoria*
Senior Engineering Geologist
Geological Services Unit - Cypress

DATE: April 23, 2009

SUBJECT: EXTRACTABLE LEAD CONCENTRATIONS FOR CALTRANS
STATEWIDE VARIANCE

PCA 24076

SITE CODE 900191

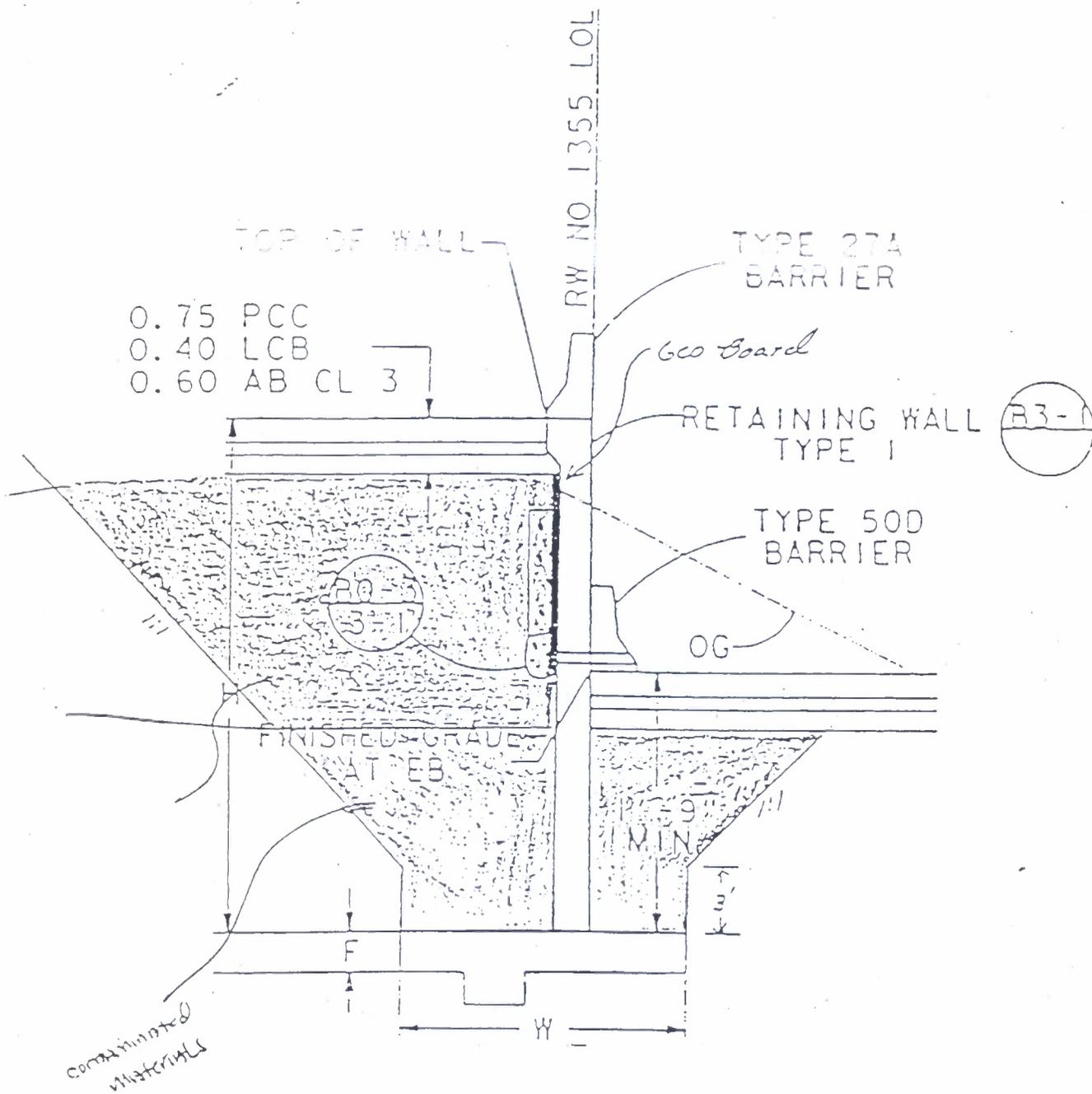
WP 50 WR# 640198

The Geological Services Unit (GSU) has been requested by the Brownfields and Environmental Restoration Program to provide recommendations for the concentrations of Extractable lead to be used in the Lead Contaminated Soil Variance for Caltrans' reuse of lead-contaminated soil.

Summary

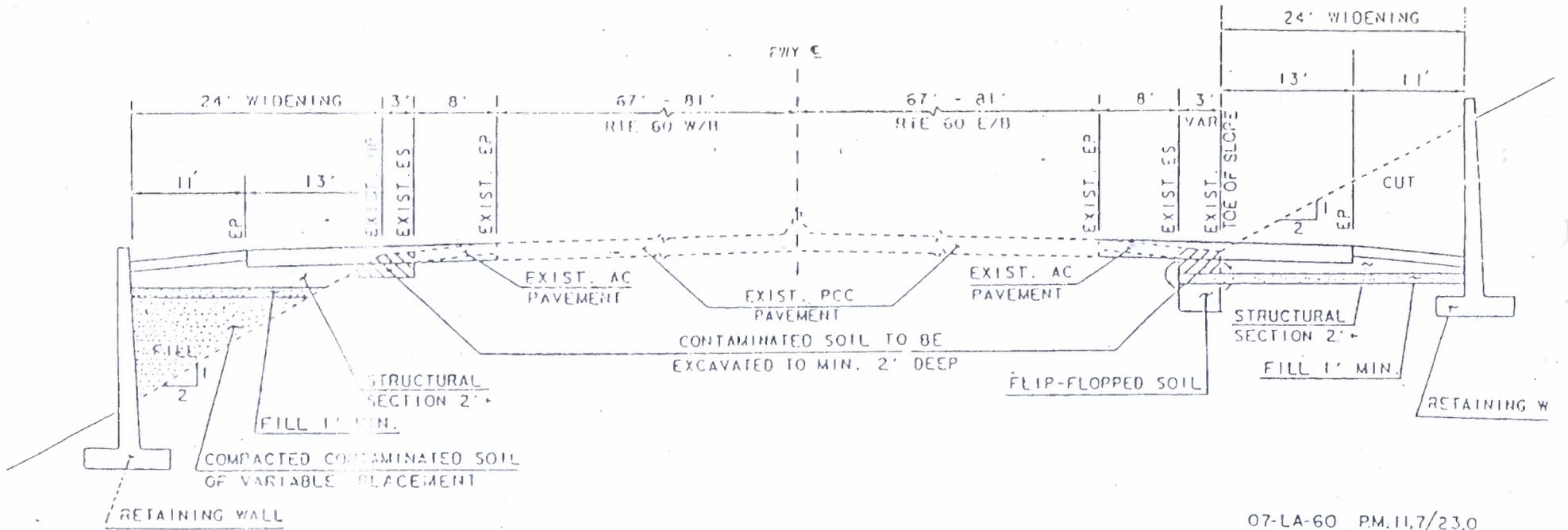
The Caltrans Variance for lead-contaminated soil issued by DTSC applies specifically to soil normally classified as a hazardous waste due to its elevated lead concentrations. Elevated lead concentrations in soils along highways are largely attributable to the fallout of lead particulates emitted from the exhaust of automobiles during the period when leaded gasoline was widely used through the 1980s. Lead chloride and lead bromide were likely the major portion of the particulate lead compounds in fresh automobile exhaust; subsequent to decomposition and interaction with soil, lead compounds in soil consist mainly of lead oxides, lead carbonates, and lead sulfates. Many of these lead compounds are weakly soluble, but may be considered immobile when considered over the lifetime of a highway. The task of the GSU was to evaluate approaches for establishing a soluble lead threshold in soil that would be protective of groundwater based on the current drinking water standard for lead. To meet this task, the GSU

EXHIBIT 3



TYPICAL SECTION

PROPOSED METHOD OF HANDLING CONTAMINATED SOIL



NO. SCALE

07-LA-60 PM.11,7/23.0
EA:129400

reviewed various studies on lead and its mobility; evaluated soil analytical data from various Caltrans highway construction projects; and utilized mathematical algorithms for predicting lead attenuation during vertical transport in the vadose zone.

While lead-contaminated highway soils pose a significant threat to the public via direct exposure, the data from published studies as well as direct measurements of California soils indicate that lead is so tightly bound to the soil that the overall potential for leaching into groundwater is low. For soil having pH less than 5; the solubility of lead increases greatly. In accordance with these considerations, the GSU recommends that soil containing 1.5 mg/l or less of extractable lead may be reused in Caltrans projects provided that it is covered under at least one foot of nonhazardous soil and is a minimum of five feet above the groundwater table. Soil containing up to 150 mg/l extractable lead may only be used as fill under pavement structure. Additionally, lead containing soil with a pH less than 5.5 should be placed under pavement; soil with pH less than 5 may not be reused on Caltrans sites.

Lead Waste Classification and Thresholds

The Caltrans Variance for lead-contaminated soil issued by DTSC applies specifically to soil that is normally classified as a hazardous waste based solely on its lead concentrations. Lead-contaminated solid waste is considered hazardous when its total lead concentration equals or exceeds the Total Threshold Limit Concentration (TTLC) of 1,000 mg/kg, and/or when the soluble concentration equals or exceeds the Soluble Threshold Limit Concentration (STLC) of 5 mg/l. The TTLC and STLC are California waste standards specified in Title 22 of the California Code of Regulations (CCR), §66261.24.

The standard procedure for determining the soluble concentration is the Waste Extraction Test (WET), which specifies the use of citric acid as extractant and is intended to simulate the acidic conditions that are generated in most landfill leachates. The WET differs from the federal Toxicity Characteristic Leaching Procedure (TCLP) which uses acetic acid as the extractant.

The STLC for lead, 5 mg/l, was promulgated in 1984 to protect drinking water supplies and was based on the Maximum Contaminant Level (MCL) for lead, which was 0.05 mg/l at that time. The STLC was derived by applying a 100-fold attenuation factor to the MCL (DTSC, 1984).

The TTLC for lead (1,000 mg/kg) was based on the risk of exposure by ingestion for children with pica (DTSC, 1984).

Caltrans Variance Specifications

On September 22, 2000 DTSC issued the Caltrans Variance for Lead-Contaminated Soil specifying the allowable concentrations of extractable lead in soil that may be used as fill in Caltrans highway construction projects. Section 9(a) of the Caltrans Variance specified soluble lead concentrations in conditions 1 and 2 as follows:

1. Soil containing 500 ug/l extractible [sic] lead or less (based on a modified waste extraction test using deionized water as the extractant)... may be used as fill provided that the lead-contaminated soil is placed a minimum of five(5) feet above the maximum water table elevation and covered with at least one (1) foot of non hazardous soil.

And,

2. Soil containing more than 500 ug/l and less than 50 mg/l extractible [sic] lead (based on a modified waste extraction test using deionized water as the extractant)...may be used as fill provided that the lead-contaminated soils are placed a minimum of five (5) feet above the maximum water table elevation and protected from infiltration by a pavement structure which will be maintained by Caltrans.

This portion of the Variance specified the allowable concentration of leachable lead that is protective of groundwater under the following conditions:

- five (5) feet of elevation above the maximum water table,
- lead-contaminated soil is covered by one (1) foot of clean soil (Condition 1), or by a pavement cover (asphalt or concrete) maintained by Caltrans (Condition 2).
- soil with pH less than 5.0 may only be used as fill under pavement cover.

The threshold leachate concentrations of 0.5 mg/L (or 500 ug/L) for Condition 1, and 50 mg/L for Condition 2, were based on the drinking water standard (MCL) for lead at that time (0.05 mg/L). These threshold concentrations were derived by multiplying the drinking standard for lead by an Attenuation Factor (AF) of 10X for Condition 1 (one-foot clean soil cover), and 1,000X for Condition 2 (engineered pavement cover).

The extraction is based on a modified WET procedure that uses deionized water to simulate ambient conditions, instead of the citric acid in the standard WET method which was intended to simulate the pH of leachate in landfill settings.

(A separate Variance condition specifies a total lead concentration to protect sensitive surface receptors from accidental ingestion/inhalation/dermal contact with lead-contaminated soils. This memo does not address that part of the variance.)

The California Maximum Contaminant Level (MCL) for lead was rescinded in 1995 with the adoption of a regulatory action level. The "Lead and Copper Rule" specifies the current action level for lead in drinking water as 0.015 mg/l (Title 22 of the CCR, §64672.3)

The GSU's task is to evaluate the approach for establishing a soil threshold protective of groundwater based on the current drinking standard for lead that can be applied statewide at Caltrans highway construction projects. More specifically, the goal is to find an appropriate quantitative estimation of the Attenuation Factor assuming the lead-bearing leachate has to travel through five feet of clean soil before reaching the water table.

Lead Near Highways

Elevated lead concentrations in soils along highways are largely attributable to the fallout of lead particulates emitted from the exhaust of automobiles during the period when leaded gasoline was widely used. Lead alkyl compounds (eg. Tetraethyl lead) were first added to gasoline in the 1920's to aid in the combustion of the gasoline and prevent "knocking". To prevent the fouling of the combustion chamber with lead oxides that formed from the lead alkyls, ethylene dichloride and ethylene dibromide were also added to gasoline, which resulted in tailpipe emissions of lead halides. The U. S. EPA implemented a gradual phase-out of lead in gasoline beginning in 1973 and continuing through the 1980's. By 1988, the amount of lead used in gasoline was less than 1% of that used in 1970. Amendments to the Clean Air Act prohibited the sale of leaded gasoline for use in motor vehicles effective December 31, 1995 (DTSC, 2004).

Other potential sources of lead in soils near highways are tire balance weights, road paint, extraneous metal fragments, imported candy wrappers, etc.

Solubility and Sorption Characteristics of Lead

Elemental lead is generally considered insoluble and highly immobile. The halides lead chloride and lead bromide, that were likely the major portion of the particulate lead compounds in fresh automobile exhaust are considered to be weakly soluble in water. Photochemical decomposition may occur during air dispersion and after deposition, resulting in the formation of lead oxides. Additionally, it has been determined that oxides, carbonates, and sulfates may be the most prominent constituents of aged exhaust particles (Olson and Skogerboe, 1975). Interaction with the soil may result in further changes to the lead compounds.

Lead is known to adsorb readily onto soil constituent surfaces such as clay, oxides, hydroxides, oxyhydroxides, and organic matter. Lead adsorption studies on bulk soils indicate that the adsorption is strongly correlated with pH and the cation exchange capacity of the soil. Some studies of lead adsorption data indicated that properties affecting the cation exchange capacity of soil such as organic matter content, clay content, and surface area of soil particles have a greater affect on lead adsorption than soil pH (U.S. EPA, 1999).

The relationship between the fraction of contaminant bound to the soil and the fraction dissolved in soil moisture (water), at equilibrium, is described by the Partition Coefficient, K_d (U.S. EPA, 1996a and 1996b).

$$K_d = C_s / C_w$$

where

K_d = Soil/water partition coefficient (L/kg, or cm^3/g),

C_s = concentration sorbed on soil (mg/kg), and;

C_w = concentration of solution (mg/L).

K_d describes the degree to which a contaminant is bound to the soil relative to its dissolved fraction under equilibrium conditions. This property is specific to the contaminant, its concentration, age, and the condition of the soil that contains it. It is derived by conducting a leaching test and a total analysis of the soil sample, and then using the analytical results to calculate the K_d .

The lower the K_d value the greater the mobility of the contaminant in soil and the greater its ability to leach into groundwater. Contaminants with a K_d less than 1.0 are considered highly mobile and pose a significant threat to groundwater. Contaminants with K_d values greater than 20 indicate that it is tightly bound to soil and that it is essentially immobile and does not pose a significant leaching concern (Hawaii DOH, 2007).

The K_d value is an important parameter when simulating fate and transport in the vadose zone using soil leaching models (e.g., SESOIL). While it was common for early modelers to rely on published K_d values derived from other sites, there is now increasing preference to use site-specific K_d values when using soil leaching models to derive soil cleanup values protective of groundwater (Hawaii DOH, 2007, New Jersey DEP, 2008, and Wisconsin DNR, 2003).

Caltrans Data

At GSU's request, Caltrans provided soil analyses data from its highway construction projects. The soil data were from Caltrans District 4 (covering the counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma) and Caltrans District 7 (Los Angeles and Ventura counties). The data consisted of both total and soluble lead (DI-WET) analyses.

Part of the data set consisted of soil analyses from various depths within the same borehole location. In general, soluble lead content decreased rapidly in the soil column, often to non-detectable concentrations within 6 inches to 1 foot from grade. However, it was not possible to use the data to derive any reasonable estimation of the rate of attenuation because of inconsistent trends in soil concentration, the high possibility of soil disturbance, and the likelihood of multiple sources. Deriving an Attenuation Factor from such data would require the assumption that lead concentration from a lower soil sample is the result of leaching from an overlying soil sample. Caltrans data indicates that this assumption may not be valid in all locations.

The greatest utility of the data, however, was in providing a direct measurement of the sorption characteristic of the soil samples with regard to lead. Since the data included total lead and dissolved lead analyses for each sampling location, it was therefore possible to derive the Partition Coefficient, K_d .

Calculated Partition Coefficients (K_d) from Caltrans Construction Projects

Partition Coefficient K_d (L/kg)	District 4 n = 156	District 7 n = 439	District 4 & 7 n = 595
Mean	333	1,608	1,274
Std. Dev.	561	2,099	1,909
Minimum	10	43	10
Maximum	4,256	21,290	21,290

(For comparison, the EPA has published K_d values ranging from 150 to 44,580 over pH ranges from 4.0 to 11.0 [U.S. EPA, 1999])

The data indicates that K_d values in District 4 (mean K_d = 333) are significantly lower than those in District 7 (mean K_d = 1,608). This is likely related to the higher precipitation rate and therefore higher moisture content of soils in northern California,

which allows more opportunity for lead to partition into the dissolved phase. Furthermore, since northern California soils appear to be more sensitive to leaching, it is only appropriate to use them as basis for formulating a statewide Attenuation Factor.

The most notable observation, however, is that the measured Kd values are well above the recognized threshold for mobility, even for the relatively low Kd of District 4 soils (mean Kd = 333). As pointed out earlier, a Kd that is higher than 20 indicates the contaminant is so tightly bound to the soil that it is essentially immobile and does not pose a significant threat of leaching.

SESOIL Modeling

In an effort to generate a numerical estimate of the Attenuation Factor based on current understanding of vadose zone fate and transport processes, the GSU tried to run the SESOIL Model using the mean Kd derived from District 4 (333 L/kg). Utilizing default soil parameters, the model was run to simulate leaching through five feet of clean soil for a period of 100 years. However, it was immediately clear that the model is unable to provide the required result because of the very high Kd value. The high Kd results in extreme retardation of the solute front as it passes through the soil column, following the equation:

$$\text{Retardation Factor} = 1 + (P_b/\theta) (K_d) \quad (\text{Fetter, 1988, page 399})$$

where

P_b = dry bulk density of the soil,

θ = volumetric moisture content of the soil, and;

Kd = Soil/water partition coefficient.

Utilizing the default value of 1.5 g/cm³ for bulk density, moisture content of 0.2 and the District 4 mean Kd of 333 cm³/g results in a Retardation Factor of 2,498. Assuming a recharge rate of 12 inches/year, this suggests that it would take approximately 2,500 years for lead-bearing solute to migrate through one foot of unsaturated soil. This simplified model assumes that all the lead will eventually leach, and does not consider that some lead will permanently bind to soil constituents. On the other hand, it is also based on the assumption of soil homogeneity and isotropy (e.g., absence of preferred pathways).

Discussion and Recommendations

Widespread use of leaded automotive fuels through the 1980s has resulted in significant lead contamination of shallow soils on and near California's highways. Because of the

toxic nature of lead, there is no doubt that these lead-contaminated soils pose a threat to California residents who might ingest, inhale or be in direct contact with the soil. This aspect of the risk is being addressed in a separate portion of the Variance.

With regard to the potential for leaching into groundwater, however, various lines of evidence indicate that such risk is low. Most important are soil data collected from actual sites in California where Caltrans has conducted construction operations. Measurements of Partitioning Coefficients (K_d) from 595 soil samples indicate that lead, while prevalent, is so tightly bound to the soil that they do not pose a serious threat of leaching into the groundwater. The measured mean K_d of 333 from northern California soils is far above the recognized threshold of $K_d = 20$ for chemicals that are considered immobile and not a threat of leaching to groundwater.

This is consistent with the observation that there is no known association between the locations of heavily used highways and groundwater lead contamination. Where lead has been found to contaminate groundwater, it is often associated with landfills, lead smelting operations, battery recycling facilities, metal plating facilities, naturally mineralized areas, military-related burn and detonation areas, etc. In many cases where monitoring or production wells have detected low concentrations of lead, these are often attributed to defective well design and construction.

The state of New Jersey includes lead among a category of "Immobile Chemicals" (together with Aluminum, Copper, Vanadium, etc.) that are considered to be strongly adsorbed to soil and are, under certain conditions, not likely to impact groundwater. Soils contaminated by these "immobile chemicals" are not required to be remediated on the condition that there is at least two feet of separation between the soil contamination and groundwater. The selection of this class of "Immobile Chemicals" was based on a series of SESOIL simulations. (New Jersey DEP, 2008)

Although the GSU's effort to quantify the Attenuation Factor the SESOIL model was unsuccessful, it provided a clear indication of the extent to which lead is bound to the soil. It should also be noted that while mathematical algorithms are useful tools for predicting the behavior of contaminants in the environment, they are based on simplifying assumptions and therefore carry some inherent uncertainties.

While the GSU was unable to achieve a quantitative determination of an Attenuation Factor that is applicable statewide, there is strong evidence that it is at least an order of magnitude higher than the current than Attenuation Factor of 10x (condition 1, clean soil cover) and 1,000x (condition 2, pavement cover). Even if the current Attenuation Factors were raised by one order of magnitude, it remains sufficiently conservative in assuring that the impacted soils do not pose undue risk to our drinking water aquifers.

With regard to restrictions related to pH conditions of the soil, various studies have shown that lead does not readily migrate unless pH conditions are significantly less than 5.0.

Serrano-Belles and Leharne (1997) reported that leaching of lead near highways was dependent on the buffer capacity of the soil, but that lead was more rapidly released when soil pH was less than 4.0. It has also been shown that the highest Kd values are encountered under conditions of high pH and very low equilibrium lead concentrations, while the lowest Kd values are encountered under lower pH and higher lead concentrations (U.S. EPA, 1999). These studies indicate dramatic change in lead sorption when soil pH is between 6.0 and 4.0 (NWETC, 2006). Because of the significant degree of lead desorption that could occur in the lower pH range, it is necessary to impose a new restriction on the lowest pH of soils that may be used in Caltrans projects, even when the soil is placed under pavement cover.

Based on these considerations, the GSU makes the following recommendations:

1. Utilize the current drinking water Action Level for lead (0.015 mg/L) as the basis for calculating a new groundwater- protective soil standard at Caltrans construction projects.
2. Retain existing conditions that these soils may only be used as fill when separated by at least five feet of clean soil from the maximum water table.
3. For calculating the maximum allowable soluble lead concentration (DI-WET), modify the existing Attenuation Factors (10X and 1,000X) by increasing them by one order of magnitude (to 100X and 10,000X, respectively). Thus,

Condition 1: $0.015 \text{ mg/L} \times 100 = 1.5 \text{ mg/L}$

Condition 2: $0.015 \text{ mg/L} \times 10,000 = 150 \text{ mg/L}$

4. Soil with pH less than 5.5 should only be placed under pavement cover. Lead-containing soil with pH less than 5.0 may not be reused on Caltrans construction sites.
5. For the purpose of future potential revisions of the Variance, we recommend that Caltrans gather data utilizing the Synthetic Precipitation Leaching Procedure (EPA Method 1312), for conducting leaching tests to derive a site-specific Soil Partitioning Coefficient (Kd). The SPLP method is a variance of the DI-WET method that appears to be gaining wider acceptance in some states. The GSU will evaluate the data submitted to determine the appropriate leaching method to be used as a condition of the Variance.

This concludes the GSU recommendation. If you have any questions or comments please telephone Wendy Arano at (714) 484-5480, or e-mail at warano@dtsc.ca.gov.

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References:

- California Department of Toxic Substances Control, 1984, "Final Statement of Reasons for Proposed Regulations: Criteria for Identification of Hazardous and Extremely Hazardous Wastes", R-45-78.
- California Department of Toxic Substances Control, 2004, "Draft Lead Report," August 2004.
- Fetter, C.W., 1988, Applied Hydrogeology, Merrill Publishing Company, pp. 397-342.
- Hawaii Department of Health, 2007, "Use of Laboratory Batch Test to Evaluate Potential Leaching of Contaminants from Soil, (Update to November 2006 Technical Memorandum)," Roger Brewer, Ph.D.
- New Jersey Department of Environmental Protection, 2008, "Introduction to Site Specific Impact to Ground Water, Soil Remediation Standards Guidance Document"
- NWETC, 2006, "Contaminant Chemistry and Transport Workshop Series," Northwest Environmental Training Center, San Diego CA, Eric McWayne, Instructor, March 14-16, 2006.
- Olson, Kenneth W. and Rodney K. Skogerboe, 1975, "Identification of Soil Lead Compounds from Automotive Sources," vol. 9, no. 3, pp. 227-230.
- U.S. EPA, 1996a, "Soil Screening Guidance: Technical Background Document," U.S. EPA, Office of Solid Waste and Emergency Response Publication 9355.4-17A, Second Edition, May 1996.
- U.S. EPA, 1996b, "Soil Screening Guidance: User's Guide," U.S. EPA, Office of Solid Waste and Emergency Response Publication 9355.4-23, Second Edition, July 1996.
- U.S. EPA, 1999, "Understanding Variation in Partition Coefficient, K_d, Values, Volume II: Review of Geochemistry and Available K_d Values for Cadmium, Cesium, Chromium, Lead, Plutonium, Radon, Strontium, Thorium, Tritium (3H), and Uranium" U.S. EPA, Office of Air and Radiation Publication 402-R-99-004B, August 1999.
- Wisconsin DNR, 2003, "Guidance on the Use of Leaching Tests for Unsaturated Contaminated Soils to Determine Groundwater Contamination Potential," Wisconsin Department of Natural Resources, PUBL RR-523-03, October 7, 2003.