Soil Management Plan (SMP)
for Site Grading and Trenching

Site Location:
APN 3090-571-17-0-000, 8.30 Acres,
Trailer Parking Lot Expansion Phase 2,
12961 Enterprise Way and 17486 Nisquali Road
Victorville, California 92395

Submitted to:
Link Logistics/BRE Paxbello LLC
3401 Etiwanda Avenue
Jurupa Valley, California 91752

Prepared by:
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Altec CP No. 1003-2023261
Issue Date: August 31, 2023

Signature Page:

By their signature, the following undersigned persons certify that this Soil Management Plan has been developed with a full understanding of the work to be implemented and the knowledge of industry regulations and practices. They further certify that they understand the plan and will follow the procedures that have been developed for the protection of the health and safety of the general public and all persons entering this work site:

Patrick S. Adams
Principal

Lynn A. Laborde
Senior Project Manager

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Sections 10.0 and 11.0 are applicable only if contaminated soil is found onsite

Appendices

1.0 INTRODUCTION

This soil management plan (SMP) should be implemented during the excavation, grading and trenching work that will take place in preparation for construction of the proposed Phase 2 Trailer Parking Lot expansion project at APN 3090-571-17-0-000 (12961 Enterprise Way and 17486 Nisquali Road) in the City of Victorville, San Bernardino County, State of California.

The APN 3090-571-17-0-000 parcel is bound to the north, west, and east by three different manufacturing, storage and distribution buildings with associated surface trailer parking, and west of local rail spurs adjacent to a drainage channel and rail tracks. The site is predominately vacant with pockets of naturally occurring vegetation. Stockpiles of soil on the order of 5 feet high were observed onsite that are associated with demolition of the previous cogeneration power facility (Foxborough) which was deconstructed around 2015.

The proposed development project will consist of a paved trailer parking lot and drive aisles across the approximate 8.3-acre parcel. There will also be a guard shack building constructed at the southwest corner of the new trailer parking lot. Floor slabs for the guard shack will be supported on-grade. The project will also include storm water infiltration systems, and landscaping on the remainder of the site.

Altec performed a Phase I environmental site assessment (ESA) for this site in January 2023. A soil management plan was recommended in case contaminated soil is encountered during grading.

The purpose of the SMP is to safeguard the construction workers and employees of nearby businesses against exposure to soil contaminants and airborne volatile organic compounds (VOCs) during site over-excavation/grading and trenching/utility installation that extends beyond the depth of over-excavation. The objective of this SMP is to provide guidance for the onsite observation, monitoring and identification of potentially contaminated soil during grading/excavation/trenching work and the proper handling, storage, and removal of impacted soil, if encountered.

The SMP includes practices that are consistent with California Code of Regulations Title 8, Occupational Safety and Health Administration (Cal/OSHA) regulations, as well as appropriate remediation standards that are protective of the planned residential use.

Appropriately trained and equipped environmental professionals (called qualified environmental professionals-QEPs) shall be on site during grading, deep utility trenching and any other related earthwork activities that will disturb the site soil in order to observe the soil conditions, screen the soil for metals and monitor volatile organic compound (VOC) emissions from the soil.

This SMP also provides guidance on how the site contractors and the QEP will work together to observe, identify, handle, and dispose of contaminated soil (if any is identified); coordinate laboratory testing; and oversee the soil transportation and disposal.

The SMP topics include:

- Identifying impacted soil
- Assessing the impacted soil
- Handling/excavating impacted soil (if needed)
- Storage of impacted soil (if needed)
- Verification/confirmation sampling (if needed)
- Waste characterization and disposal (if needed)

The SMP identifies the anticipated field screening methods and appropriate regulatory limits to be applied to determine proper handling and disposal. It includes requirements for documenting and reporting incidents of encountered contaminants, such as documenting locations of occurrence, sampling results, and reporting actions taken to dispose of contaminated materials.

In the event that potentially contaminated soils are encountered, the soil will be tested by the QEP. Depending on the nature and extent of the identified impacts, it may be appropriate to involve oversight from the Certified Unified Program Agency (CUPA)-San Bernardino County Fire Department Hazardous Materials Management Department to determine whether further assessment or active remediation is warranted.

ACTION NEEDED:

Provide this SMP document to the grading contractor a month or more prior to the start of their site work. The grading contractor must have an ample supply of 10-mil polyethylene sheeting and sandbags available onsite in case impacted soil is encountered.

Require that the grading contractor include a section on potential impacted soil in their Site-Specific Health and Safety Plan (HASP).

Notify Altec Testing & Engineering, Inc. (Altec) by calling (909) 645-3826 or emailing llaborde@altectesting.com or contacting another qualified environmental professional (QEP) at least 2 weeks before the start of grading or trenching so that an appropriate inspector can be assigned to the project.

2.0 PRIOR DIESEL FUEL SPILL

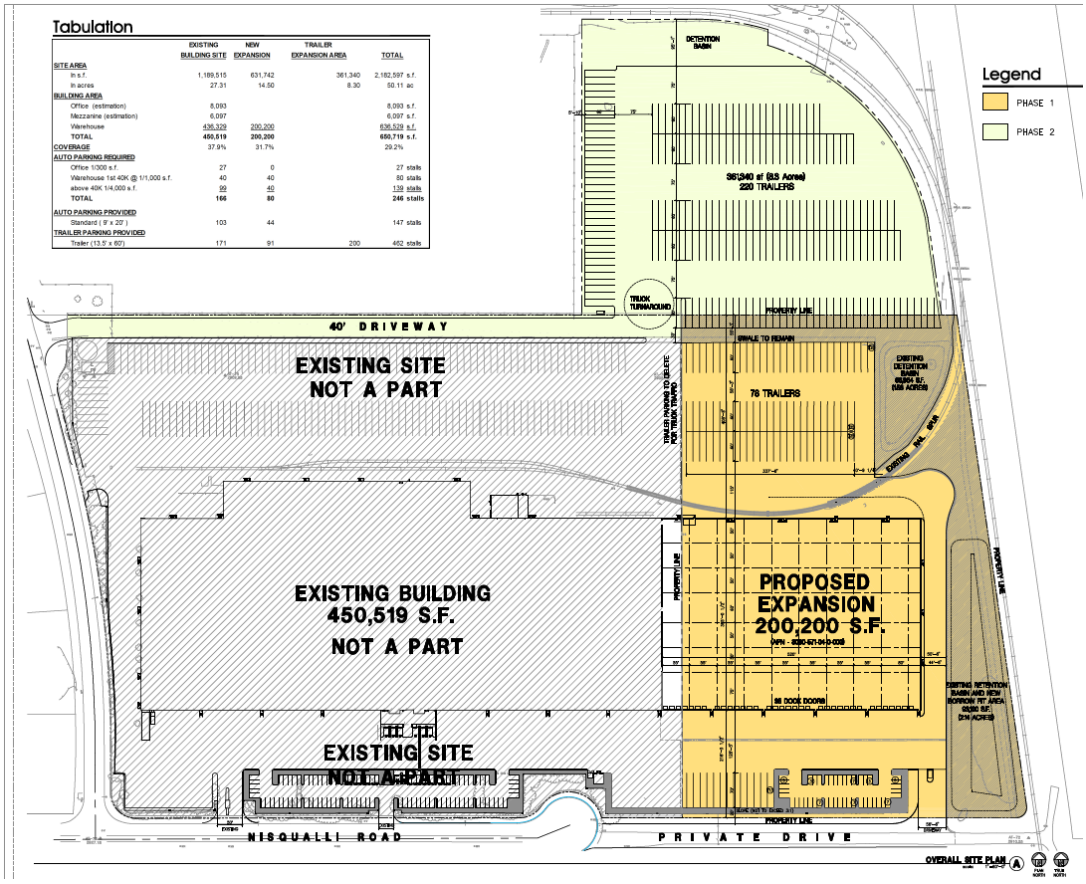
There was a diesel fuel spill in the northwest corner of the site in 2008. Diesel was presumably released from an aboveground diesel storage tank that held fuel used in construction equipment during the Foxborough Power Plant construction, or occurred while the AST was being filled. The city of Victorville provided rough details of the spill response effort which included excavation, transportation, and disposal of 814 tons of diesel impacted soil. Offsite dirt was imported to the site to backfill the remedial excavation.

Although no closure report for the remediation work could be obtained, soil sampling performed by an environmental consultant, CHJ, in 2017 showed no detectable TPH concentrations (gas-diesel-oil ranges) or volatile organic compounds (VOCs) in the deeper soil within the remedial excavation area.

In July 2023, Altec collected representative soil samples from 1 foot below grade within the backfilled excavation to evaluate the imported backfill material to evaluate the soil for contaminants. The samples were analyzed for Total Petroleum Hydrocarbons (TPH), Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Polychlorinated Biphenyls (PCBs), CA Title 22 Metals, Hexavalent Chromium, Organochlorine Pesticides (OCPs), Organophosphorus Pesticides (OPPs), Chlorinated Herbicides (CHs) and Asbestos. The detected analyte concentrations in the samples were evaluated for exposure risk in comparison to applicable agency screening levels published in (1) California Environmental Protection Agency (Cal/EPA) Department of Toxic Substances Control (DTSC), Office of Human and Ecological Risk (HERO), Human Health Risk Assessment (HHRA) Note 3 DTSC-modified Screening Levels (SLs) June 2020 Revised, (2) Federal EPA Regional Screening Levels (RSLs), May 2023 and (3) San Francisco Bay Regional Water Quality Control Board (RWQCB), Environmental Screening Levels (ESLs), 2019 (Rev.2). Altec concluded that the soil represented by the samples collected from the imported backfill material at the northwest corner of the trailer lot expansion parcel meets the Cal/EPA DTSC criteria for Clean Imported Fill Material.

3.0 SITE DESCRIPTION

The site is located in Victorville, San Bernardino County, California. It is configured as a flag lot and is located on the east side of Enterprise Way, south of Nutro Street, north of Nisquali Road and west of the Burlington Northern Santa Fe Railroad tracks. According to the San Bernardino County Assessor, it is comprised of 8.3 acres. The site is shown in light green shading on the image below:



Construction began on the Phase 1 portion of the Church & Dwight expansion project in the spring of 2022. The Phase 1 area is directly east of the Church & Dwight warehouse building (yellow shading on the figure insert above). The second phase of the expansion, which includes the site parcel, is scheduled to start in 2023.

The adjoining/immediately surrounding properties consist of industrial warehouses and businesses to the north, west and south (south side of Nisquali Road); rail spurs and railroad tracks directly east; and undeveloped land further north and undeveloped land/single-family homes further to the east.

Site access driveway from Enterprise Way, Dec. 9, 2022.

Sign at entrance gate (southwest corner), Dec. 9, 2022.

Trailers stored on lot (Dec. 9, 2022).

Trailers stored on lot (Dec. 9, 2022).

Trailers stored on lot (Dec. 9, 2022).

Remnant utility protrusions on east side of lot (Dec. 9, 2022).

4.0 PROPOSED DEVELOPMENT

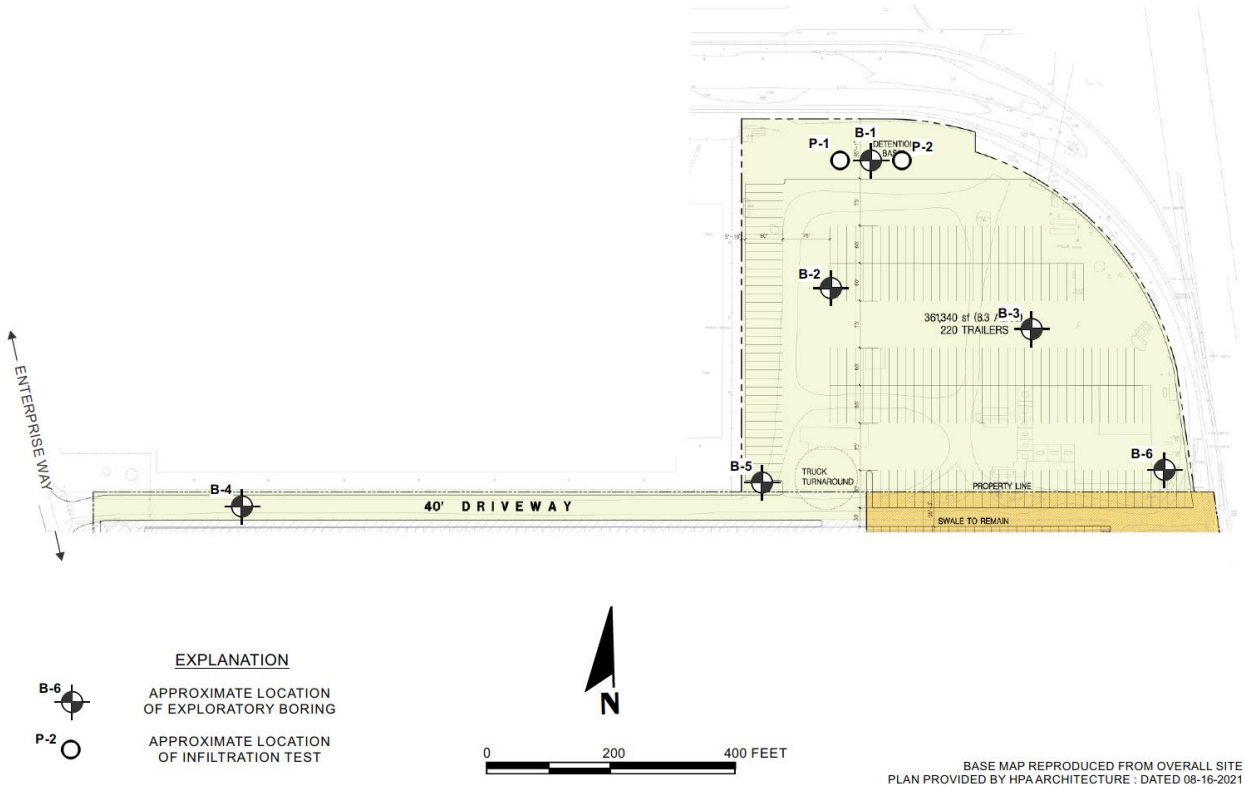
The proposed development includes a paved trailer parking lot and drive aisles across the approximately 8.3-acre site. There will also be a new guard shack building located at the southwest corner of the new parking lot. Floor slabs for the guard shack will be supported on-grade. The project will also include storm water infiltration systems, and landscaping on the remainder of the site.

Proposed finished elevations were not available at the time of preparing this SMP, however grades are anticipated to be predominately within 2 to 4 feet of existing grades. The finished grades for the proposed guard shack are anticipated to be within 2 to 4 feet of existing grades.

5.0 SUBSURFACE CONDITIONS

A geotechnical investigation was performed at the site in January 2022 by Geotechnical Professionals, Inc. (GPI). GPI's subsurface exploration consisted of 6 hollow stem auger borings and 2 infiltration test wells. The borings were performed to depths of 4 to 26 feet below existing grade and the percolation wells were installed at depths of 10 to 12 feet below existing grades. Boring B-6 (located in the southeast corner of the parcel) was refused on concrete prior to reaching its desired depth of 5 feet. The purpose of the investigation was to evaluate the existing geotechnical conditions and provide geotechnical recommendations for earthwork, and design of foundations and pavements for the proposed trailer storage lot.

The test boring and infiltration well locations are shown on the figure inserted below.



Undocumented fills were encountered to approximately 2 to 5 feet below existing grade in GPI's geotechnical explorations. The fill materials encountered consisted of medium dense, dry to slightly moist silty sands and sands with varying amount of gravel.

The deeper fill soils were predominately associated with the existing unpaved entrance drive along the southern property line at the site.

Limited areas may have deeper undocumented fill soils in the vicinity of the previous cogeneration plant (near boring B-6) in the southeastern corner of the site.

The natural soils consist predominately of silty sand with varying amounts of gravel and possible cobbles to a depth of approximately 13 to 15 feet where we encountered layered clayey sands, silty sands, and gravelly sands. In general, the native soils were dense to very dense and very stiff to hard. The natural soils have moderate to high strength and low compressibility characteristics.

Groundwater was not encountered in our explorations drilled to a maximum depth of 26 feet below ground surface. Published data by the California Department of Water Resources indicates groundwater is deeper than 100 feet below the ground surface.

6.0 IDENTIFIED SOIL HAZARDS

No specific soil contaminants have been identified to date.

The main suspected contaminant in soil is diesel range organic compounds (total petroleum hydrocarbons-TPH-D)) associated with the diesel spill that occurred in 2008 at the northwest corner of the parcel.

There is a potential that other contaminants could be found onsite that were associated with the power plant construction activities or other unknown sources.

Provisions shall be available during grading to aid in the detection of volatile organic compounds (VOCs) using a calibrated photoionization detector (PID) and metals using an x-ray fluorescence analyzer (XRF).

7.0 ENVIRONMENTAL PROFESSIONAL QUALIFICATIONS

Site grading/excavation activities shall be observed by a trained and qualified environmental professional (QEP) capable of identifying potentially contaminated soil/debris. The environmental professional shall operate the PID or OVA device to screen air emissions during grading and trenching/excavation and shall observe the soil to identify any visible signs of potential impacts. XRF devices will be used to physically screen the soil for the presence of elevated concentrations of metals. The QEP shall be prepared to collect soil samples as needed and submit them for laboratory analysis and to direct the grading contractor on the safe stockpiling/storage of the potentially impacted soil/debris.

A qualified environmental remediation contractor should be on standby in case soils are encountered that yield/generate VOC emissions over 50 ppm or if metal-contaminated or stained/odorous soil is identified.

8.0 HEALTH AND SAFETY PLAN

Altec recommends that the grading contractor include a section on potential impacted soil in their Site-Specific Health and Safety Plan (HASP).

The purpose of a Health and Safety Plan is to inform all field personnel of proper safety procedures and potential health risks while they are working at the site. All project personnel should familiarize themselves with the HASP and adhere to its established procedures and recommendations. A copy of the HASP should be kept on site and all personnel should be trained on the topics of the HASP. The HASP should be updated if site conditions change.

8.1 Personal Training

Work hazards are primarily physical hazards associated with soil excavation equipment and practices. Personnel working in the work zones should have received appropriate safety training.

If contaminated soil is encountered that exceeds 50 ppm on the PID or OVA or exceeds DTSC or EPA soil screening levels for metals on the XRF device, a qualified environmental remediation contractor should be engaged to perform the soil excavation and removal work.

All employees working onsite during the removal of contaminated soil who may be exposed to hazardous substances, health hazards, or safety hazards shall be properly trained (*HAZWOPER training is recommended for all employees who will interact with potentially impacted soil*). Supervisors and managers responsible for the site shall receive training, meeting the requirements of this section, before they are permitted to engage in operations that could expose them to safety or health hazards.

8.2 Site Training

Altec recommends that general site workers (such as equipment operators, general laborers, and supervisory personnel) engaged in soil grading, trenching and/or excavation activities be appropriately trained, informed of the potential site hazards and how to identify them and work under an experienced supervisor. Altec recommends that occasional workers, onsite for specific limited tasks (e.g., shoring installation, land surveying, etc.) and who are unlikely to be exposed to physical hazards still work under the direct supervision of an appropriately trained and experienced supervisor. If hazardous materials, such as gasoline or diesel fuel, are brought onto or stored onsite, Altec recommends that site managers and supervisors directly responsible for or who supervise employees engaged in hazardous material operations shall receive appropriate training at the time of job assignment on such topics as, but not limited to, the employer's health and safety program, spill containment program, and health hazard monitoring procedure and techniques. Employees shall not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.

8.3 Site Training Elements

Altec recommends that site training cover the following:

- Names of primary and alternate personnel responsible for site health and safety.
- Engineering controls and work practices by which the employee can minimize on the job risks and hazards.
- Recognition of symptoms and signs that might indicate work-related hazards such as heat exhaustion, heat stroke, and other potential hazards.
- Minimizing exposure to soil and dust, and appropriate worker hygiene at the work site.
- The topics addressed in this SMP.

8.4 Recommended Qualifications for Trainers

Trainers shall be qualified to instruct employees about the subject matter that is being presented in training. Such trainers shall have satisfactorily completed a training program for teaching the subjects they are expected to teach, or they shall have the academic credentials and instructional experience necessary for teaching the subjects. Instructors shall demonstrate competent instructional skills and knowledge of their applicable subject matter. Employees and supervisors that have received and successfully completed the training and field experience shall be certified by their instructor or the head instructor and their trained supervisor as having successfully completed the necessary training.

Altec can provide training for the grading contractor site perfsonnel.

8.5 Potential Hazards

The following hazard information was published by the National Institute for Occupational Safety and Health (NIOSH) for TPH.

Contaminant	CAS No.	Effects/Symptoms	Exposure Routes	Target Organs
TPHv	none	Irritation eyes, skin, nose, throat, respiratory system; nausea.	Inhalation, skin absorption, ingestion, skin and/or eye contact	Eyes, skin, airway, nervous system, and lungs

9.0 OBSERVATIONS AND MONITORING

The QEP will visually observe the subsurface soil during grading for the presence of staining or odors which are typical indicators of contamination. The QEP shall be on site during grading and any other related earthwork activities that will disturb the site soil. The QEP will observe the activities and soil conditions and monitor the airborne emissions from during the grading/trenching for the presence of VOCs with a PID or OVA.

In addition, monitoring will be performed using a calibrated photoionization detector (PID) and an x-ray fluorescence analyzer (XRF).

The QEP will monitor the air emissions in the downwind direction at a distance of 3 inches or less from the soil surface to determine the VOC concentrations. If at any time the PID readings document VOC emissions nearing or exceeding 50 parts per million (ppm), work shall be stopped. This is an indication that VOC-contaminated has been discovered.

VOC contaminated soil is a soil which registers a concentration of 50 ppm or greater of VOCs as measured before suppression materials have been applied and at a distance of no more than three inches from the surface of the excavated soil with a PID or OVA.

If VOC contaminated soil is detected, the QEP will monitor for VOC contamination at least once every 15 minutes commencing at the beginning of excavation or grading and record all VOC concentration readings on a written log. The monitoring records must be kept on site during the work. Keep calibration records for all monitoring instruments available on site.

The site shall implement a mitigation plan if/when VOC-contaminated soil is detected during excavation or grading.

Soil exhibiting any signs of staining, odors or elevated metals shall be placed on top of thick polyethylene sheeting (10 mil or more) and covered with polyethylene sheeting secured with sandbag until the material can be further assessed in accordance with the SMP.

9.1 VOC Contaminated Soil Handling

If VOC contaminated soil is detected, it will be handled as follows:

- Segregate VOC-contaminated stockpiles from non-VOC contaminated stockpiles such that mixing of the stockpiles does not take place.

- Spray VOC-contaminated soil stockpiles with water and/or approved vapor suppressant and cover them with plastic sheeting for all periods of inactivity lasting more than one hour.

- Conduct a daily visual inspection of all covered VOC contaminated soil stockpiles to ensure the integrity of the plastic covered surfaces. A daily inspection record must be maintained on site.

- The contractor must have a VOC soil mitigation plan.

- Maintain a record of the identification and business addresses of the generator, transporter and storage/treatment facilities. Such record shall be signed by each party at the time custody is transferred for the contaminated soil.

- Treat or remove contaminated soil from an excavation or grading site within 30 days from the time of excavation.

If the VOC concentration in the excavated soil is measured at greater than **1000 ppm**, spray the soil with water or vapor suppressant and:

- As soon as possible, but not more than 15 minutes, place the soil in sealed containers, or

- As soon as possible, but not more than 15 minutes, load into trucks, moisten with additional water, cover and transport off site.

VOC-contaminated soil shall not be treated onsite.

A person shall not engage in or allow any on-site or off-site spreading, grading or screening of VOC-contaminated soil, which results in uncontrolled evaporation of VOC to the atmosphere.

Loading trucks with VOC-contaminated soil must meet the following:

The truck and trailer shall be adequately tarped prior to leaving the site; no excavated materials shall extend above the sides or rear of the truck or trailer to prevent soil spillage during transport, and

The exterior of the truck, trailer and tires shall be cleaned off prior to the truck leaving the site.

9.2 VOC Contaminated Soil Mitigation Plan

VOC contaminated soil mitigation plan is a plan to minimize VOC emissions to the atmosphere during excavation and any subsequent handling of VOC-contaminated soil. If VOC-contaminated soil is detected on the site, a soil mitigation plan is required.

SECTIONS 10.0 AND 11.0

APPLICABLE ONLY IF CONTAMINATED SOIL IS FOUND ONSITE

10.0 VOC-CONTAMINATED SOIL HANDLING-LOADING-DISPOSAL

This section is applicable if VOC contaminated soil is identified during grading or trenching.

10.1 Excavation Procedures

VOC CONTAMINATED SOIL is a soil which registers a VOC concentration of 50 ppm or greater as measured before suppression materials have been applied and at a distance of no more than three inches from the surface of the excavated soil with an organic vapor analyzer (OVA) calibrated with hexane. The use of PIDs is approved by the air quality district. PIDs are usually calibrated with isobutylene.

A VOC CONTAMINATED SOIL MITIGATION PLAN must be implemented to minimize VOC emissions to the atmosphere during excavation and any subsequent handling of VOC-contaminated soil.

When VOC-contaminated soil is detected during excavation or grading:

- Implement the approved mitigation plan
- Monitor and record VOC concentration readings as prescribed in the plan. Monitoring records must be kept available on site
- Keep calibration records for all monitoring instruments available on site

Excavation activities that will be undertaken during the construction phase of the project will include excavations to lower site elevations to proposed plan grade elevations, over-excavations to usually a maximum of 5 feet below proposed elevations to provide properly compacted building pads, foundation excavations for structures, and trenching for utilities and piping.

Excavation and offsite removal of contaminated soil is not anticipated at this time. However, contaminated soil vapor may be released from the soil when the impacted soil areas are disturbed by the grading/excavation equipment. PID or OVA screening of the soil during the initial few days of grading and deep utility trenching will determine whether the released vapor will exceed 50 ppm on the PID or OVA (and therefore qualify as a VOC-contaminated soil). If emissions exceed 50 ppm, then a contractor with a Rule 1166 'various locations' permit must perform the grading and soil handling work. Altec recommends that the soil be monitored closely by a qualified environmental professional.

Also contaminated debris or abandoned cesspools and septic systems may be present and may contained impacted materials. If soil/debris is encountered that is obviously contaminated (i.e., soil appears stained or has a strong odor), the contractor should stop work activities until the potential contamination can be assessed and classified by a qualified environmental professional. Soil displaying visual and/or olfactory signs of contamination (debris, paint chips, staining, odor) shall be segregated and stockpiled (to ensure that it is properly segregated from clean reusable soil) and subsequently analyzed before it is transported off site for disposal.

10.2 Contaminated Soil

A person handling VOC-contaminated soil at or from an excavation or grading site shall:

1) Segregate VOC-contaminated stockpiles from non-VOC contaminated stockpiles such that mixing of the stockpiles does not take place.
2) Spray VOC-contaminated soil stockpiles with water and/or approved vapor suppressant and cover them with plastic sheeting for all periods of inactivity lasting more than one hour.
3) Conduct a daily visual inspection of all covered VOC contaminated soil stockpiles to ensure the integrity of the plastic covered surfaces. A daily inspection record must be maintained on site.
4) Comply with the provisions in subparagraph (c) (1)(A) and clause (c)(1)(D)(i) of Rule 1166.
5) Maintain a record of the identification and business addresses of the generator, transporter and storage/treatment facilities. Such record shall be signed by each party at the time custody is transferred.
6) Treat or remove contaminated soil from an excavation or grading site within 30 days from the time of excavation.

If VOC concentrations in the excavated soil is measures at greater than 1000 ppm, the contractor must spray the soil with water or vapor suppressant and:

1) As soon as possible, but not more than 15 minutes, place the soil in sealed containers, or
2) As soon as possible, but not more than 15 minutes, load into trucks, moisten with additional water, cover and transport off site, or
3) Implement other alternative storage methods approved in writing by the Executive Officer.

10.3 Temporary Storage and Segregation

If contaminated or suspected contaminated soil is encountered during grading and/or excavation activities, the soil shall be excavated and placed in a temporary stockpile(s) or a temporary roll-off closed-top bin immediately after being excavated. The temporary stockpile(s) and/or bins will be located onsite, near the area from which the impacted soil originated. If placed in one or more stockpiles, contaminated soil shall be placed on top of heavy-gauge plastic sheeting (10 to 15-mil thickness) and shall be covered with plastic sheeting (at least 6 mils thickness), which will then be secured in place with sandbags. The stockpiles will be designed, constructed, and operated to contain the soil, prevent release and erosion by wind or storm water, and prevent the contamination of storm water by the contaminated soil. After excavation activities are complete, soil samples will be collected from the stockpiles (or contained soil) in accordance with the United States Environmental Protection Agency (USEPA) Publication SW-846 and landfill acceptance criteria to characterize the soil for disposal.

10.4 Waste Characterization and Segregation

If contaminated soil is encountered during construction activities, representative grab soil samples will be analyzed at a minimum by the following analyses:

- TPH by EPA Method 8015 Modified,
- VOCs by EPA Method 8260B (collected and preserved per EPA Method 5035),
- Metals by EPA Method 6010/7471
- Hexavalent chromium by EPA 7199
- SVOCs by EPA Method 8270

These samples will be collected to both characterize contamination at the site and for waste characterization purposes. Additional analyses will be performed, if deemed necessary, based on visual and/or olfactory observations and analytical results. The soil sampling frequency will be based on the specific landfill requirements. The maximum number of samples expected is shown below and follows the volume of soil excavated per the following table:

Suggested Soil Sampling Frequency for Waste Profiling

Soil Volume (cubic yards-CY)	Number of Samples
Up to 1000	1 sample per 250 CY
1000-5000	4 samples for first 1000 CY and 1 sample per additional 500 CY
5000+	12 samples per first 5000 CY plus 1 sample per additional 1000 CY

The Total Threshold Limit Concentration (TTLC) reflects the total concentration of a target analyte in a sample. When any target analyte exceeds the TTLC limits, the waste is classified as a California non-Resource Conservation and Recovery Act (RCRA) hazardous waste and its waste code is determined by the compounds that failed the TTLC.

Supplemental waste extraction testing analysis may be warranted, and if so, selected soil samples may be analyzed by the Toxicity Characteristic Leaching Procedure (TCLP) method to determine if the soil is RCRA hazardous waste based upon Federal standards or by the Soluble Threshold Limit Concentration (STLC) method to determine if the soil is California non-RCRA hazardous waste soil.

To determine if STLC analysis is necessary, the TTLC result for each analyte is compared to 10 times the STLC limit for that analyte. If the soil concentration of a constituent exceeds 10 times the STLC limit for that constituent, then the soil must undergo analysis by the STLC method to determine if the constituent may leach out of the soil after it is disposed in a landfill. Following the performance of the STLC analysis, if the results exceed the STLC concentration, then the soil is considered, at a minimum, California non-RCRA hazardous and must be disposed of in a landfill that is prepared for such hazardous materials.

To determine if TCLP analysis is necessary, the TTLC result for each analyte is compared to 10 times the TCLP limit for that analyte. This is done by comparing 20 times the TCLP limit to the concentration of the analyte. If the soil concentration of a constituent exceeds 20 times the TCLP limit, then the soil must undergo analysis by the TCLP method. Following the performance of the TCLP analysis, if the result exceeds the TCLP concentration, then the soil is considered RCRA hazardous and must be disposed of in a landfill that is prepared for such hazardous materials.

The soil profiles will be submitted to waste disposal/recycling facilities that are fully permitted to accept the classification of the contaminated soil and in compliance with the facility's waste acceptance policies. Waste profiles will include analytical data and a description of the waste stream. Upon acceptance/approval of a waste profile by the disposal/recycling facility, contaminated soil may be transported to the facility under the manifesting procedures discussed below.

10.5 Confirmation Samples

Altec recommends that confirmation sampling be conducted to verify that all contaminated soil has been excavated. Sampling will include collection of excavation sidewall and bottom samples at a frequency of one sample every 15 feet of sidewall and every 225 square feet of bottom. They should be analyzed in accordance with the appropriate USEPA Methods. The confirmation samples shall be analyzed on a 24-hour turn-around time. As such, confirmation samples will be collected in EPA 5035 containers using kits supplied by the laboratory. Sampling equipment will be decontaminated prior to sampling at each location.

Confirmation samples should also be collected underneath any soil stockpiles at a frequency of one sample per 225 square feet or area. They should also be analyzed in accordance with USEPA Method 8260B for VOCs and all other appropriate USEPA Method.

10.6 Soil Sample Collection Procedures

Samples will be collected using disposable nitrile gloves, and a Terracore kit (or equivalent) that meets the requirements of EPA 5035. The sampling personnel shall make every effort to minimize the volume of air space within the containers in order to minimize the loss of volatile constituents. In addition, all soil sampling for VOCs will be per EPA Method 5035 (field preservation method). The soil samples will be immediately placed into an ice chilled cooler and transported to a California certified laboratory for analysis.

All reusable sampling equipment that comes into contact with potentially contaminated soil will be decontaminated prior to reuse. Disposable equipment intended for one-time use (e.g., nitrile gloves) will not be decontaminated and will be packaged for appropriate disposal. Sampling equipment will be decontaminated using the following steps:

- Non-phosphate soap wash, using a brush as necessary
- Rinse with tap water
- Final rinse using clean de-ionized or distilled water

At a minimum, the following information will be recorded during the collection of each soil profiling sample (if necessary):

- Sample identification number (includes sample location)
- Sampler's name(s)
- Date and time of sample collection
- Analytical method(s)
- Field observations and details important to analysis or integrity of samples (e.g., heavy rains, odors, colors, etc.)
  Instrument readings

10.7 Chain-Of-Custody Records

Chain-of-custody records are used to document sample collection and shipment to the laboratory for analysis. All sample shipments for analyses will be accompanied by a chain-of-custody record. If multiple shipments are sent to a single laboratory on a single day, chain-of-custody form(s) will be completed and sent with each sample shipment. The chain-of-custody record will identify the contents of each shipment and maintain the custodial integrity of the samples. Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel. Until receipt by the laboratory, the custody of the samples will be the responsibility of the sample collector.

10.8 Decontamination Area (if needed)

An equipment decontamination area will be set up at each excavation area where contaminated soil is found/removed. Measures will be implemented as necessary to minimize the dispersal of impacted soil. Truck decontamination zones will be established in the areas where trucks will be exiting the work area. Equipment decontamination areas will be fully contained to collect all excess soil removed and liquids utilized during the decontamination process.

10.9 Site Dust Control

In general, dust control measures for the grading, trench/excavation and all other site work shall be implemented by the grading contractor, or environmental contractor if VOC-contaminated soil or soil contaminated with other chemicals is excavated.

These measures include the suppression of visible dust discharges beyond the site property line for more than 3 minutes in any 60-minute period and implementation of Best Management Practices (BMPs) to control track-out/carry-out.

Dust suppression will be accomplished by lightly spraying or misting the work areas with water. Water mist may also be used on soil stockpiles during loading and unloading of soil, in the transport trucks, and on the onsite truck routes. The volume of water added to suppress dust will not exceed the moisture-holding capacity of the soil. In addition, after contaminated soil is loaded into the

transport trucks, the soil will be covered with tarps that are adequately secured to ensure that soil will not spill out of the truck during transport to the disposal facility.

Contaminated soil stockpile locations will be situated in areas shielded from the prevailing wind, where practical, placed on 10- to 15-mil plastic sheeting, and covered with plastic sheeting (6-mil) that is secured with sandbags. For dust control purposes, efforts shall be made to minimize the soil drop height from the excavator or backhoe's bucket onto the soil pile and/or into the transport trucks. If adequate room is available, the excavator/backhoe will be positioned to load or stockpile soil from the upwind side. If sustained wind speeds exceed 15 miles per hour (mph) for a period of 15 minutes, excavation activities will cease until the wind speed is below 15 mph.

10.10 Transport and Disposal

The contractor will pack, label, store handle, transport, and dispose of soil that is classified as RCRA or California hazardous waste in compliance with CCR Title 22 and CFR Titles 40 and 49. The contractor will use landfill facilities that are authorized to accept the types of waste generated and hauled. The contractor will notify the appropriate agencies of any hazardous waste dumped by third parties in the work area. The contractor will document and maintain a record of contact of all agencies notified of hazardous waste dumped by third parties in the work area.

Provided below is the general methodology for contaminated soil profiling, loading, and manifesting and a discussion of soil transportation modes and potential contaminated soil disposal facilities. If VOC-contaminated soil is identified onsite, addition provisions may be implemented.

10.11 Shipping Documentation

A truck log will be maintained and will include the trailer number and company affiliation, the date and time that the truck leaves the site, the approximate volume of each load, and the hazardous or non-hazardous waste manifest number. In addition, materials will leave the site with the appropriate paperwork (e.g. Bill of Lading or Uniform Hazardous Waste Manifest). Copies of hazardous waste manifests or other documents indicating the amount, nature, and disposition of such materials shall be submitted to the grading contractor within 5 days of shipment. Generator copies of both RCRA-Hazardous and Non-RCRA (California) Hazardous Waste Manifests will be submitted to the DTSC within 30 days of shipment.

10.12 Soil Profiling

The results of the characterization of the impacted soil will indicate whether the stockpiled soils will be disposed of as non-hazardous, California non-RCRA hazardous, or RCRA hazardous (or other pre-approved facility selected by grading contractor).

Waste soil will be disposed of at suitable approved landfills.

10.13 Soil Transportation

The excavated contaminated soil will be transported via roll-off bin hauling trucks, end-dumps or bottom-dump trucks as needed. It is estimated that each truck will have a capacity to haul between 10 and 20 tons of soil/material. If the soil is being transported as non-RCRA or RCRA hazardous waste, the transport company will be required to provide proof of valid certification to transport hazardous soil/materials prior to transporting the soil.

Before leaving the site, a gravel bed or dirt stopper will be placed at exit areas prior to entering the public street. Any dirt stuck on the trucks and/or in the tire treads must be scrubbed down prior to exiting the site to prevent any contaminated soil from being carried to the public street. Any soil on the street shall be removed immediately.

Each truck driver transporting non-RCRA or RCRA hazardous waste will be instructed to notify the Altec representative of any incidents during transport. Each truck driver will be provided with the cellular phone number for the appropriate contact. It will be the responsibility of the grading contractor to notify DTSC of any unforeseen incidents; Related's contact will notify the grading contractor's representative immediately.

As a backup emergency provision, the freeway call boxes can be utilized to report roadside incidents and contact disposal facilities. Each truck driver will be instructed to report any roadside emergency using the call box system or cellular phone. In the event of an accidental release, the Highway Patrol and local emergency response personnel will be contacted.

Once at the disposal facilities, each truck will be weighted before offloading. Copies of waste manifests will be provided to the construction contractor after all the impacted soil has been shipped from the site and delivered to the appropriate disposal facility.

10.14 Truck Transportation Routes

Given the network of freeways within the Southern California area, multiple routes to and from the designated landfill facility will be identified. In addition, given the characteristics of the soil that could be transported and the limited quantity, there are no apparent restrictions that would preclude the trucks from following the drivers' desired routes to the disposal facilities.

10.15 Backfill/Imported Fill Soil

If backfill or imported soil is required to backfill excavations or to raise surface levels to planned grade elevations, imported fill soil will be screened and approved in accordance with the DTSC Information Advisory on Clean Imported Fill Material. A copy of the DTSC's advisory is provided as Appendix A.

Suggested Soil Sampling Frequency for Import Fill

Soil Volume (cubic yards-CY)	Number of Samples
Up to 1000	1 sample per 250 CY
1000-5000	4 samples for first 1000 CY and 1 sample per additional 500 CY
5000+	12 samples per first 5000 CY plus 1 sample per additional 1000

10.16 Documentation

Documentation of environmental field and soil management activities will be recorded in field logbooks, chain-of-custody forms, and through the use of photographs.

10.17 Field Logbooks

Field logbooks will be maintained by grading contractor field personnel to document site observations. Logbook entries will be complete and accurate enough to permit reconstruction of field activities. All entries will be legible, factual, and objective. If an error is made, corrections will be made by crossing a line through the error and entering the correct information. Corrections will be dated and initialed. At a minimum, entries in the field logbook will include the following for each field day:

- Date
- Site name/location
- Recorder's name
- Team members and their responsibilities
- Other personnel at the site
- Weather conditions
- A summary of any on-site meetings
- A brief summary of the day's activities and progress
- Estimated volumes of excavated soil and/or transported for each day in the field
- Levels of safety protection
- Calibration readings for any monitoring equipment used and equipment model and serial number
- Identification of any major findings or observations

10.18 Photographs

Photographs will be taken at representative locations and at other areas of interest when deemed necessary for documentation purposes. The photographs will serve to verify information entered in the field logbook.

10.19 Record Keeping

The contractor will keep the following records:

- Total duration of project (start and stop dates)
- Results of the PID or OVA monitoring for VOC emissions during grading and excavation
- Results of all required analytical testing for profiling purposes
- Destination and quantities of soil hauled off-site
- Copies of waste manifests
- Maps of work area or excavation(s)
- Details of any unexpected conditions encountered during excavating
- A discussion of any deviations from the proposed excavation or soil hauling activities

11.0 SOIL EVALUATION CRITERIA

This section describes the methodology for evaluation of the contaminant concentrations identified in the impacted soil, if any is identified.

As indicated in Section 7.4 Waste Characterization and Segregation, if VOC-contaminated soil (or soil contaminated with other hazardous chemicals) is encountered during construction activities, representative grab soil samples will be analyzed at a minimum by the following analyses for waste profiling purposes:

- TPHcc by EPA Method 8015 Modified (collected and preserved per EPA Method 5035)
- VOCs by EPA Method 8260B (collected and preserved per EPA Method 5035)
- SVOCs by EPA Method 8270
- Metals by EPA Method 6010/7470
- Hexavalent chromium by EPA 7196A or 7199 (minimum MDL of 0.3 mg/kg)
- Polychlorinated Biphenyls (PCBs) by USEPA 8082

These samples will be collected to both characterize contamination at the site and for waste characterization purposes. Additional analyses will be performed, if deemed necessary, based on visual and/or olfactory observations and analytical results. Results of the TTLC, STLC and TCLP analyses will be compared to published criteria for waste characterization purposes and for soil reuse purposes.

Several published guidelines set forth industry standards regarding contaminant screening levels, hazardous waste levels and maximum contaminant levels that are applicable to soil, soil gas/vapor and groundwater contaminant evaluation. The soil and soil gas/vapor screening levels include the State of California Department of Toxic Substances Control (DTSC) HHRA HERO Note 3 screening levels, Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs), and the EPA Regional Screening Levels (RSLs). Petroleum hydrocarbon (and other contaminants) screening limits have been published the California Regional Water Quality Control Board and EPA and other local agencies. Hazardous waste regulated levels include the Total Threshold Limit Concentrations (TTLCs), the Soluble Threshold Limit Concentrations (STLCs) and the Toxicity Characteristic Leaching Procedure (TCLP) limits that are published in Federal and State regulations.

The following sections describe the guidelines that are typically consulted as part of the data evaluation process for soil, soil gas/vapor and groundwater contamination.

11.1 Soil Screening Levels

CalEPA Department of Toxic Substances Control (DTSC) Office of Human and Ecological Risk (HERO)
In a published memorandum entitled *Human Health Risk Assessment (HHRA) Note Number: 3,* issued on July 14, 2014 (and subsequently revised), CalEPA DTSC formally recommended use of the 2004 U.S. EPA Region 9 California modified PRGs over the 2013 (and subsequent) U.S.

EPA RSLs in the Human Health Risk Assessment process at hazardous waste sites and permitted facilities.

In 2008, the U.S. EPA released Regional Screening Levels (RSLs) to replace the Preliminary Remediation Goals (PRGs) formerly available from U.S. EPA. DTSC's HERO reviewed the differences in methodology and RSL concentrations to develop a methodology to incorporate the RSLs into HERO human health risk assessment consultation and review. In addition to incorporation of more recent toxicity values than those used in the U.S. EPA Region 9 PRGs, several differences in methodology result in a subset of RSLs (for soil, tapwater and air) substantially higher (less protective) than the former PRGs. Initial versions of HHRA Note 3 addressed soil and tapwater RSLs only. For the majority of the approximately 750 listed chemicals, HERO recommends the values listed in the U.S. EPA RSL table. However some values listed in the U.S. EPA RSL table differ significantly (greater than four-fold) from values calculated using CalEPA toxicity criteria and risk assessment procedures. In an effort to provide risk assessment RSL recommendations, HERO prepared reference Table 1 for compounds with soil and tapwater RSLs for which 1) the 2004 PRG should be used; 2) the 2004 'Cal-modified' PRG should be used; or 3) the DTSC-modified screening levels derived using the RSL on-line screening calculator should be used. In addition, specific recommendations and discussion are provided for several contaminants. Alternatively, in consultation with HERO, the U.S. EPA on-line screening calculator can be used to calculate site specific values using the more protective of CalEPA and U.S. EPA toxicity values and applying assumptions consistent with HERO recommendations (e.g. route-to-route extrapolation between the oral and inhalation exposure pathways where no toxicity value is available for the inhalation route of exposure but an oral toxicity value is available).

CalEPA DTSC Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance)

The intrusion of subsurface vapors into buildings is one of many exposure pathways to be considered in assessing the risk posed by releases of hazardous chemicals into the environment. The Department of Toxic Substances Control (DTSC) recommends an approach for evaluating vapor intrusion into buildings and its subsequent impact on indoor air quality. The Guidance is used by regulators, responsible parties, environmental consultants, community groups, and property developers.

VOCs are present in the subsurface at a site and vapor intrusion has been evaluated along with the exposure pathways identified in Cal/EPA DTSC's guidance documents. A vapor barrier and passive venting system will be installed for the proposed site buildings.

U.S. EPA Region 9 Regional Screening Levels (RSLs)

U.S. EPA RSLs are concentrations for contaminants in air, drinking water, and soil that are protective for human health under assumed reasonable maximum residential or commercial/industrial exposure conditions. RSLs were initially developed for use in the EPA's Superfund/Resource Conservation and Recovery Act (RCRA) programs. However, only some of the RSLs incorporate California toxicity parameters. They were previously called Preliminary Remediation Goals (PRGs).

The RSLs can be used for site screening and as initial cleanup goals. RSLs are not officially established cleanup standards and should not be applied as such. The RSL's role in site screening is to help identify areas, contaminants, and conditions that require further attention/evaluation. Generally, at sites where contaminant concentrations fall below RSLs, no further action is warranted, providing the exposure assumptions at the specific site match those taken into account by the RSL calculations. A contaminants concentration above a RSL would not automatically designate a site as contaminated or trigger a response action; however, exceeding a RSL indicates that further evaluation is needed.

U.S. EPA Region 9 indicates that they do not distribute outdated copies of the screening level tables. Each new version of the table supersedes all previous versions.

RWQCB Environmental Screening Levels (ESLs)
Qualified city or county agencies are approved by the State of California to oversee site assessment and clean-up efforts under specific conditions. The California Environmental Protection Agency Department of Toxic Substances Control (CalEPA DTSC) authorizes these local agencies and approves their oversight on a case-by-case basis.

Regional Water Quality Control Board - San Francisco Bay Environmental Screening Levels - The California Leaking Underground Fuel Tank (LUFT) Manual references the use of the San Francisco Bay RWQCB Environmental Screening Levels (ESLs) for site screening purposes. ESLs provide conservative screening levels for over 100 chemicals commonly found at sites with contaminated soil and groundwater. They are intended to help expedite the identification and evaluation of potential environmental concerns at contaminated sites. ESLs address a range of media (soil, groundwater, soil gas/vapor, and indoor air) and a range of concerns (e.g., impacts to drinking water, vapor intrusion, and impacts to aquatic life). This document presents lookup tables for chemicals commonly found at sites with contaminated soil, groundwater, and/or soil vapor. For a particular chemical, the lookup tables present multiple screening levels designed to be protective of human health, ecological receptors, and drinking water. Care must be given to select the appropriate tables for site-specific screening purposes, and to understand the assumptions made for the identified contaminants. These screening levels can be used to eliminate contaminants from further evaluation; however, if a contaminants concentration exceeds the screening level, it should not be interpreted as indicating an unacceptable risk.

11.2 Hazardous Waste Determination

Total Threshold Limit Concentrations (TTLCs) & Soluble Threshold Limit Concentrations (STLCs)
State laws and regulations for hazardous waste determination are contained in California Health and Safety Code (HSC), Division 20, Chapter 6.5, and Title 22, California Code of Regulations, Division 4.5 (22CCR), various chapters.

Laboratory testing is often performed to determine if soil is potentially hazardous prior to excavation or disposal. If hazardous, soil requires special treatment prior to excavation and disposal. It must be disposed of in specially permitted controlled landfills or processed through permitted treatment systems to prevent contamination of air, soil and groundwater. TTLC and

STLC refer to values/limits established by California regulations to help determine whether a waste is hazardous or non-hazardous.

The Total Threshold Limit Concentrations (TTLC) is a maximum concentration value established for specific analytes below which a solid waste would be considered non-hazardous. If the laboratory result is greater than the TTLC value for a specific analyte, the waste is considered toxic and is deemed hazardous (thereby requiring special procedures for packaging, transportation and disposal).

The Soluble Threshold Limit Concentrations (STLC) is the maximum concentration value set for specific analytes below which a solid waste would be considered non-hazardous. If the laboratory result is greater than the STLC value for a specific analyte, the waste is considered toxic and is deemed a California hazardous waste.

When a waste material is analyzed, and the concentration of a specific analyte is found to be lower than the TTLC value no other steps are required for that analyte. However, if the concentration of a specific analyte is found to be lower than the TTLC value but higher than 10 times the STLC value, additional testing is required. This additional testing is called a Waste Extraction Test (WET). The WET is also referred to as the STLC test because it determines the soluble extraction concentration value that is then compared to the published STLC value. If the laboratory result for the WET test is equal to or greater than the STLC value, the waste is considered to be a California hazardous. If the result is less than the STLC value, the waste is non-hazardous based on toxicity, assuming no other factors apply.

Even if a waste passes the TTLC/STLC tests further evaluation and/or testing may be necessary depending on the waste stream. These additional evaluations/tests include determining whether the waste exhibits the characteristics of ignitability, corrosivity, or reactivity. Additionally, CalEPA has published lists of hazardous wastes which are hazardous by definition, or "listed wastes", and require no laboratory testing. There are also lists of U.S. EPA hazardous wastes, extremely hazardous wastes and special wastes. U.S. EPA has published lists of chemical substances and common wastes that are presumed to be hazardous unless the generator's waste determination proves them to be non-hazardous.

Toxicity Characteristic Leaching Procedure (TCLP) Limits
In Title 40 of the Code of Federal Regulations (40 CFR) Part 26, the Resource Conservation and Recovery Act (RCRA) established U.S. federal laws governing the disposal of hazardous wastes.

Under federal law, a waste is considered hazardous when it exhibits one or more of the following characteristics:

Ignitable (Flashpoint <140 $^{\circ}$F)
Corrosive (aqueous pH < 2 or > 12.5)
Reactive (normally unstable, water reactive)
Toxic (exceeding the regulatory limits for contaminants by the TCLP analysis)
Is otherwise listed as a Hazardous Waste in 40CFR

RCRA requires that industrial waste streams and other wastes be characterized following protocols laid out in the U.S. EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, which includes analytical and sampling methods that have been evaluated and approved for use in complying with the RCRA regulations. These analytical tests are used to determine if a waste hazardous.

The Toxicity Characteristic Leaching Procedure (TCLP) is a federal testing method performed on wastes intended for landfill disposal. This test is performed to determine if a waste meets the definition of "toxic" under RCRA. It is somewhat similar to the WET test performed in California. The differences are in relation to the type of extraction fluid used and the length of time that the sample is tumbled or digested in the fluid.

Much like the STLC evaluation process, when a waste material is analyzed and the concentration of a specific analyte is found to be greater than 20 times the TCLP value, TCLP testing is required. The TCLP test determines the soluble extraction concentration value that is then compared to the published TCLP value. If the TCLP laboratory result is equal to or greater than the TCLP value, the waste is considered to be a Federal RCRA hazardous waste. If the result is less than the TCLP value, the waste is non RCRA.

11.3 Naturally Occurring/Background Chemical Concentrations in Soil

It is not uncommon to encounter metals in California soils at concentrations exceeding the published screening levels. To evaluate the health and environmental risks associated with inorganic elements (metals) in soil/groundwater, it is often necessary to differentiate between background (naturally occurring) and anthropogenic (originating from human activity) sources of the analytes. Determining how/why a detected analyte is present at a property is important for site characterization, defining contaminants of concern, and establishing cleanup levels. CalEPA DTSC has established a regional background arsenic concentration in soil that is routinely used as a screening tool for southern California properties. DTSC considered background to include both naturally occurring and anthropogenic concentrations in shallow soil. The following documents indicate that certain metal concentrations are considered representative of background conditions in southern California:

1. Determination of a Southern California Regional Background Arsenic Concentration in Soil, G. Chernoff, W. Bosan, and D. Oudiz, California Department of Toxic Substances Control.
2. Background Concentrations of Trace and Major Elements in Soils, Kearney Foundation of Soil Science Division of Agriculture and Natural Resources University of California March 1996.
3. Inorganic Chemicals in Groundwater and Soil: Background Concentrations at California Air Force Bases, Phillip M. Hunter, Brian K. Davis, and Frank Roach, March 19, 2005.

APPENDIX A

DTSC Information Advisory, Clean Imported Fill Material (2001)

Information Advisory
Clean Imported Fill Material

October 2001

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

It is DTSC's mission to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

State of California

California Environmental Protection Agency

Executive Summary

This fact sheet has been prepared to ensure that inappropriate fill material is not introduced onto sensitive land use properties under the oversight of the DTSC or applicable regulatory authorities. Sensitive land use properties include those that contain facilities such as hospitals, homes, day care centers, and schools. This document only focuses on human health concerns and ecological issues are not addressed. It identifies those types of land use activities that may be appropriate when determining whether a site may be used as a fill material source area. It also provides guidelines for the appropriate types of analyses that should be performed relative to the former land use, and for the number of samples that should be collected and analyzed based on the estimated volume of fill material that will need to be used. The information provided in this fact sheet is not regulatory in nature, rather is to be used as a guide, and in most situations the final decision as to the acceptability of fill material for a sensitive land use property is made on a case-by-case basis by the appropriate regulatory agency.

Introduction

The use of imported fill material has recently come under scrutiny because of the instances where contaminated soil has been brought onto an otherwise clean site. However, there are currently no established standards in the statutes or regulations that address environmental requirements for imported fill material. Therefore, the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) has prepared this fact sheet to identify procedures that can be used to minimize the possibility of introducing contaminated soil onto a site that requires imported fill material. Such sites include those that are undergoing site remediation, corrective action, and closure activities overseen by DTSC or the appropriate regulatory agency. These procedures may also apply to construction projects that will result in sensitive land uses. The intent of this fact sheet is to protect people who live on or otherwise use a sensitive land use property. By using this fact sheet as a guide, the reader will minimize the chance of introducing fill material that may result in potential risk to human health or the environment at some future time.

Overview

Both natural and manmade fill materials are used for a variety of purposes. Fill material properties are commonly controlled to meet the necessary site specific engineering specifications. Because most sites requiring fill material are located in or near urban areas, the fill materials are often obtained from construction projects that generate an excess of soil, and from demolition debris (asphalt, broken concrete, etc.). However, materials from those types of sites may or may not be appropriate, depending on the proposed use of the fill, and the quality of the assessment and/or mitigation measures, if necessary. Therefore, unless material from construction projects can be demonstrated to be free of contamination and/or appropriate for the proposed use, the use of that material as fill should be avoided.

Selecting Fill Material

In general, the fill source area should be located in nonindustrial areas, and not from sites undergoing an environmental cleanup. Nonindustrial sites include those that were previously undeveloped, or used solely for residential or agricultural purposes. If the source is from an agricultural area, care should be taken to insure that the fill does not include former agricultural waste process byproducts such as manure or other decomposed organic material. Undesirable sources of fill material include industrial and/or commercial sites where hazardous ma-

Potential Contaminants Based on the Fill Source Area

Fill Source:	Target Compounds
Land near to an existing freeway	Lead (EPA methods 6010B or 7471A), PAHs (EPA method 8310)
Land near a mining area or rock quarry	Heavy Metals (EPA methods 6010B and 7471A), asbestos (polarized light microscopy), pH
Agricultural land	Pesticides (Organochlorine Pesticides: EPA method 8081A or 8080A; Organophosphorus Pesticides: EPA method 8141A; Chlorinated Herbicides: EPA method 8151A), heavy metals (EPA methods 6010B and 7471A)
Residential/acceptable commercial land	VOCs (EPA method 8021 or 8260B, as appropriate and combined with collection by EPA Method 5035), semi-VOCs (EPA method 8270C), TPH (modified EPA method 8015), PCBs (EPA method 8082 or 8080A), heavy metals including lead (EPA methods 6010B and 7471A), asbestos (OSHA Method ID-191)

**The recommended analyses should be performed in accordance with USEPA SW-846 methods (1996). Other possible analyses include Hexavalent Chromium: EPA method 7199*

Recommended Fill Material Sampling Schedule

Area of Individual Borrow Area	Sampling Requirements
2 acres or less	Minimum of 4 samples
2 to 4 acres	Minimum of 1 sample every 1/2 acre
4 to 10 acres	Minimum of 8 samples
Greater than 10 acres	Minimum of 8 locations with 4 subsamples per location
Volume of Borrow Area Stockpile	**Samples per Volume**
Up to 1,000 cubic yards	1 sample per 250 cubic yards
1,000 to 5,000 cubic yards	4 samples for first 1000 cubic yards +1 sample per each additional 500 cubic yards
Greater than 5,000 cubic yards	12 samples for first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

terials were used, handled or stored as part of the business operations, or unpaved parking areas where petroleum hydrocarbons could have been spilled or leaked into the soil. Undesirable commercial sites include former gasoline service stations, retail strip malls that contained dry cleaners or photographic processing facilities, paint stores, auto repair and/or painting facilities. Undesirable industrial facilities include metal processing shops, manufacturing facilities, aerospace facilities, oil refineries, waste treatment plants, etc. Alternatives to using fill from construction sites include the use of fill material obtained from a commercial supplier of fill material or from soil pits in rural or suburban areas. However, care should be taken to ensure that those materials are also uncontaminated.

Documentation and Analysis

In order to minimize the potential of introducing contaminated fill material onto a site, it is necessary to verify through documentation that the fill source is appropriate and/or to have the fill material analyzed for potential contaminants based on the location and history of the source area. Fill documentation should include detailed information on the previous use of the land from where the fill is taken, whether an environmental site assessment was performed and its findings, and the results of any testing performed. It is recommended that any such documentation should be signed by an appropriately licensed (CA-registered) individual. If such documentation is not available or is inadequate, samples of the fill material should be chemically analyzed. Analysis of the fill material should be based on the source of the fill and knowledge of the prior land use.

Detectable amounts of compounds of concern within the fill material should be evaluated for risk in accordance with the DTSC Preliminary Endangerment Assessment (PEA) Guidance Manual. If

metal analyses are performed, only those metals (CAM 17 / Title 22) to which risk levels have been assigned need to be evaluated. At present, the DTSC is working to establish California Screening Levels (CSL) to determine whether some compounds of concern pose a risk. Until such time as these CSL values are established, DTSC recommends that the DTSC PEA Guidance Manual or an equivalent process be referenced. This guidance may include the Regional Water Quality Control Board's (RWQCB) guidelines for reuse of non-hazardous petroleum hydrocarbon contaminated soil as applied to Total Petroleum Hydrocarbons (TPH) only. The RWQCB guidelines should not be used for volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCS). In addition, a standard laboratory data package, including a summary of the QA/QC (Quality Assurance/Quality Control) sample results should also accompany all analytical reports.

When possible, representative samples should be collected at the borrow area while the potential fill material is still in place, and analyzed prior to removal from the borrow area. In addition to performing the appropriate analyses of the fill material, an appropriate number of samples should also be determined based on the approximate volume or area of soil to be used as fill material. The table above can be used as a guide to determine the number of samples needed to adequately characterize the fill material when sampled at the borrow site.

Alternative Sampling

A Phase I or PEA may be conducted prior to sampling to determine whether the borrow area may have been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with DTSC or appropriate regulatory agency. However, if it is not possible to analyze the fill material at the borrow area or determine that it is appropriate for use via a Phase I or PEA, it is recommended that one (1) sample per truckload be collected and analyzed for all compounds of concern to ensure that the imported soil is uncontaminated and acceptable. (See chart on Potential Contaminants Based on the Fill Source Area for appropriate analyses). This sampling frequency may be modified upon consultation with the DTSC or appropriate regulatory agency if all of the fill material is derived from a common borrow area. However, fill material that is not characterized at the borrow area will need to be stockpiled either on or off-site until the analyses have been completed. In addition, should contaminants exceeding acceptance criteria be identified in the stockpiled fill material, that material will be deemed unacceptable and new fill material will need to be obtained, sampled and analyzed. Therefore, the DTSC recommends that all sampling and analyses should be completed prior to delivery to the site to ensure the soil is free of contamination, and to eliminate unnecessary transportation charges for unacceptable fill material.

Composite sampling for fill material characterization may or may not be appropriate, depending on quality and homogeneity of source/borrow area, and compounds of concern. Compositing samples for volatile and semivolatile constituents is not acceptable. Composite sampling for heavy metals, pesticides, herbicides or PAH's from unanalyzed stockpiled soil is also unacceptable, unless it is stockpiled at the borrow area and originates from the same source area. In addition, if samples are composited, they should be from the same soil layer, and not from different soil layers.

When very large volumes of fill material are anticipated, or when larger areas are being considered as borrow areas, the DTSC recommends that a Phase I or PEA be conducted on the area to ensure that the borrow area has not been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with the DTSC.

For further information, call Richard Coffman, Ph.D., R.G., at (818) 551-2175.