ENVIRONMENTAL GUIDANCE FOR INDUSTRIAL FILL MATERIAL

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The Port of Los Angeles has prepared this guidance document to ensure that fill materials (i.e., soil, topsoil, CMB, etc.) meet both Port and regulatory and environmental standards for acceptable industrial land use material. In addition, the guidance procedures are intended to both reduce Port liability and potential future cleanup costs by preventing the inadvertent placement or reuse of contaminated soil/fill material on Port property. The environmental chemical concentrations listed in this section are intended only for industrial land use for the protection of human health and the environment. They are not appropriate in determining suitable soil/fill material for use at former or active regulated/cleanup sites, public access/land use areas, or for worker health & safety protection.

Environmental Suitability of Soil/Fill Material for Industrial Use

The general process steps for determining the environmental suitability of fill material for industrial land use are the following:

1. Source Location Identification
2. Volume Estimation
3. Sampling Frequency Determination
4. Chemical Analyses Based on Source
5. Representative Sample Collection
6. Applicable Samples Analyses
7. Comparisons with Allowable Concentrations
8. Documentation and Retention

• Source Location Identification

It is important to know the source location of the soil/fill material, including the former and current land uses of the material. Past activities performed on, or near, the proposed source location can directly affect the quality of the fill material and the suitability of use of the material. Prior use of the source site should be documented and be made available for review.

Also, the unique hydrogeological characteristics of the Port area (i.e., shallow groundwater and proximity to harbor waters) require added attention for the protection of water quality. It's strongly recommended that clean CMB only be used for applications such as road base, paving, container terminal construction, and/or asphalt/concrete parking. CMB should not be used as a substitute for soil as general fill, or within sensitive-use areas including, but not limited to, sites under regulatory oversight or remediation, park lands, public access areas, and waterfront areas in potential contact with harbor waters.

- ## Volume Estimation of Soil/Fill Material

The volume of soil/fill material determines the sampling frequency required. It is important to have a fairly accurate estimate of the material volume prior to sample collection and analysis. If the volume of soil/fill material cannot be accurately determined, the upper-end estimate of the volume shall be used for purposes of determining sampling frequency.

- ## Sampling Frequency Determination

The minimum sampling frequency and number of total samples of soil/fill material are shown in Table 1. Borrow sources that are not contiguous to each other are considered to be separate or different sources and should be tested separately according to the frequencies described in Table 1. In order to distinguish between multiple borrow sources, the sampler/supplier shall provide a "unique identifier" for each stockpile or borrow source sampled (e.g. Stockpile A, Stockpile B, etc.). A site plan (e.g. map) showing the location of the source material and sample locations should be provided. In addition, the results of laboratory analytical chemical data and an approval certification stating the environmental status/condition of the material from the supplier for the sources should also be provided.

Table 1. Sampling Frequency for Each (Separate) Source of Fill Material

Volume of Borrow Area Stockpile	Required Number of Samples per Volume
Up to 1,000 CY	1 sample per 250 CY
1,000 to 5,000 CY	4 samples for first 1000 CY +1 sample per each additional 500 CY
Greater than 5,000 CY	12 samples for first 5,000 CY +1 sample per each additional 1,000 CY

NOTE: CY = Cubic Yard
Source: Information Advisory Clean Imported Fill Material, DTSC, October 2001

- ## Chemical Analyses Based on Source

Table 2 provides a set of recommended chemical analyses based on the source or origin of the fill material. Except as noted, soil/fill source areas shall not be located in:

a. Heavy industrial/manufacturing areas (with the exception of soils/material generated within the Port).
b. Sites designated for or undergoing environmental cleanup.
c. Sites where hazardous materials were used or hazardous wastes were generated (e.g., service or fueling stations, dry cleaners, oil refineries, scrap yards, boatyards, chemical/liquid storage areas, painting facilities, metal processing shops, etc.).

For both excavated on-site and off-site material, target compounds to be analyzed may be pre-determined or reduced by assessing environmental conditions of the borrow area prior to implementing the excavation. Although, the Port does not recommend the use of soil/fill material from land adjacent to freeways and highways, mining areas, and/or agricultural lands, Table 2 provides a suggested list of target compounds and sampling tests for such locations.

Table 2. Recommended Chemical Analyses of Material Based on Source/Origin

Fill Source	Target Compounds and Analyses
Land near an existing freeway or major highway	• TPH (modified EPA Method 8015) • Lead (EPA Method 6010B) • PAHs (EPA method 8310)
Mining area or rock quarry	• Heavy metals (EPA Methods 6020 and 7471A) • Asbestos (polarized light microscopy)
Agricultural	• Pesticides and Herbicides (Organochlorine Pesticides: EPA Method 8081A or 8080A; Organophosphorus Pesticides: EPA Method 8141A; Chlorinated Herbicides: EPA Method 8151A) • Heavy metals (EPA Methods 6020 and 7471A), including hexavalent chromium (EPA Method 7199)
Acceptable commercial land	• VOCs (EPA Method 8021 or 8260B, as appropriate and combined with collection by EPA Method 5035) • Semi-VOCs (EPA Method 8270SIM) • TPH (modified EPA Method 8015B) • PCBs (EPA Method 8082 or 8080A) • Heavy metals including lead (EPA Methods 6020 and 7471A), including hexavalent chromium (EPA Method 7199)

- **Representative Sample Collection**

Soil/fill material samples needs to be collected in a manner (both in sample number and depth) that accurately represents the overall environmental chemical quality of the excavation area, borrow site, or stockpile(s). In-situ sampling requirements for in-place fill material should be determined in advanced consultation/discussions with qualified Port personnel (e.g., Project Engineer/Construction Manager).

Samples must be collected and properly preserved/stored (e.g., specified temperatures, within appropriate containers and holding times, etc.) until delivery to a California-certified analytical laboratory (e.g., ELAP and/or NELAP certification) for analyses. Appropriate sample handling and preservation procedures are specified in the US EPA "Test Methods for Evaluating Solid Waste-Physical/Chemical Methods (SW-846)." Each collected soil/material sample will be recorded on a chain-of-custody form prior to submittal to the laboratory for analysis.

- **Applicable Samples Analyses**

  All soil samples need to be analyzed using the applicable EPA Methods listed in Table 3. If one is aware of, has knowledge of, or suspects possible contaminants in the soil/fill material (e.g., observations of staining, discoloration, and/or odors) that are not included in the list, an analysis of the suspected contaminant(s) should be conducted. In addition, the contractor needs to demonstrate due diligence in obtaining information (e.g., Phase I) about historical property land uses at proposed existing and off-site borrow locations prior to placement of the material in the Port.

- **Comparisons with Allowable Concentrations**

  Table 3 presents the chemical concentrations for soil/ fill material at the Port of Los Angeles. Generally, soil/fill material with sample results below (less than) the permissible chemical concentrations may be used as industrial-use fill within the Port. Soil/fill material with sample results above (greater than) the permissible chemical concentrations material cannot be used as fill and must be properly disposed of, unless directed otherwise. It's important to note that the recommended sampling frequencies in Table 1 and the subsequent sampling results only provide an indication of potential contamination problems with the soil/fill material. Slight exceedances in Table 3 limits in some of the samples, do not necessarily make the entire stockpile or borrow area unusable. Unless the exceedances are present throughout a number of the samples, a combination of both professional judgment and sectioning-off of the contaminated areas will likely allow use of most of the selected fill material.

  In general, the primary target or 'driver' compounds of concern in the Port are TPH, benzene, PCBs, lead, and copper. While there are a number of other chemicals (including human carcinogens) found in the Port, these target compounds are the most prevalent. At a minimum, all samples should be tested for these target compounds.

  Please note in Table 3 that any soil/fill sample having undergone chemical analyses with a dilution factor greater than 1 (see Footnote #3) or uses detection limits greater than the permissible concentrations in Table 3 may be rejected due to potentially elevated concentrations of one or more contaminants.

  As a reminder, the environmental chemical concentrations listed in this Table are intended only for general industrial land use for the protection of human health and the environment. The listed concentrations are not intended to be applicable or to determine suitable soil/fill material for use at former or active regulated/cleanup sites, public/recreation land use areas, or for worker health & safety protection.

Table 3. Permissible Chemical Concentrations in Fill Material

Chemicals of Concern (COC) Industrial Land Use	Soil/Fill Material Concentration (*mg/kg*)	Source
Total Petroleum Hydrocarbons (TPH) *(EPA Method 8015M/8015B)*		
TPH (Total Petroleum Hydrocarbons)	1,000	Cal-EPA SWRCB[1]
➢ Gasoline (if present)	180	Cal-EPA SWRCB/DTSC[1]
➢ Diesel (if present)	180	Cal-EPA SWRCB/DTSC[1]
Heavy Metals *(EPA Method 6020/7471A)*		
Antimony	40	Cal-EPA SWRCB/DTSC[1]
Arsenic	8.7	Cal-EPA SWRCB/DTSC[1]
Barium	1000	10 X STLC[2]/DTSC
Beryllium	7.5	10 X STLC[2]
Cadmium	1.4	Cal-EPA SWRCB/DTSC[1]
Chromium VI (EPA Method 7199/3060A)	8	Cal-EPA SWRCB/DTSC[1]
Total Chromium	100	20 X TCLP/STLC[2]
Cobalt	80	Cal-EPA SWRCB/DTSC[1]
Copper	69	Cal-EPA SWRCB/DTSC[1]
Lead	50	10 X STLC[2]/DTSC
Mercury	0.69	Cal-EPA SWRCB/DTSC[1]
Molybdenum	4.4	Cal-EPA SWRCB/DTSC[1]
Nickel	200	10 X STLC[2]/DTSC
Selenium	0.23	Cal-EPA SWRCB[1]
Silver	3.75	Cal-EPA SWRCB/DTSC[1]
Thallium	0.95	Cal-EPA SWRCB[1]
Vanadium	200	Cal-EPA SWRCB[1]
Zinc	680	Cal-EPA SWRCB/DTSC[1]
BTEX *(EPA Method 8260)*		
Benzene	0.055	Cal-EPA SWRCB/DTSC[1]
Toluene	56	Cal-EPA SWRCB[1]
Ethylbenzene	3.9	Cal-EPA SWRCB[1]
Xylene	7.2	Cal-EPA SWRCB[1]
Naphthalene	0.17	DTSC
Asbestos *(OSHA Method ID-191)*	ND	Laboratory Reporting Limit[3]
Polychlorinated Biphenyls (PCBs) *(EPA 8082)*	ND	Laboratory Reporting Limit[3]/US EPA
Chemicals of Concern		
Volatile Organic Compounds (VOCs)[4] (EPA Method 8260)		Laboratory Reporting Limit[3]
Polynuclear Aromatic Hydrocarbons (PAHs)[4] (EPA Method 8310)		Laboratory Reporting Limit[3]
Semi Volatile Organic Compounds (SVOCs)[4] (EPA Method8270)		Laboratory Reporting Limit[3]
Organochlorine Pesticides[4] (EPA Method 8081A)		Laboratory Reporting Limit[3]
Organophosphorus Pesticides[4] (EPA Method 8141A)		Laboratory Reporting Limit[3]
Chlorinated Herbicides[4] (EPA Method 8151A)		Laboratory Reporting Limit[3]

NOTES:

1. Cal-EPA State Water Resources Control Board & Department of Toxic Substances Control Action Goals for Industrial Land Use sites only. The listed concentrations/levels may not be applicable for former or active cleanup sites, public land use, or worker health & safety.
2. Soluble Threshold Limit Concentration (STLC), California Code of Regulations (CCR), Title 22, Section 66261.24. Characteristic of Toxicity
3. Laboratory Reporting Limit is based on reporting limits commonly used by Southern California laboratories (DAF=1)

- **Documentation and Retention**

  A written, preferably electronic, record of the sampling protocols, sampling locations, analytical results, and determination of suitability for industrial land use as fill shall be maintained and made available for staff review, upon request.

Authorization for Soil/Fill Concentrations

The chemical/contaminant criteria utilized in this document for industrial land use soil/fill material were compiled from a number of current sources, standards, regulations, and/or guidance documents including, but not limited to:

- Compliance with applicable laws and regulations;
- California Environmental Protection Agency - State Water Resources Control Board (SWRCB) and Department of Toxic Substances Control (DTSC);
- Title 40, Code of Federal Regulations (40 CFR)
- California Health and Safety Code (HSC), Division 20, Chapter 6.5, Hazardous Waste Control Law and California Code of Regulations, Division 4.5, Title 22 CCR;
- Information Advisory Clean Imported Fill Material (DTSC, October 2001);
- User's Guide: Derivation and Application of Environmental Screening Levels (SFRWQCB), Interim Final 2013);
- Revised Responses to Stakeholder's Comments Memorandum - Former GATX Los Angeles Marine Terminal (LAMT), Berths 171 through 173, Wilmington, CA (Cleanup and Abatement Order No. R4-2008-006), (LARWQCB Geotracker), January 19, 2010); and
- Commonly used Laboratory Reporting Limits (LRLs) and Method Detection Limits (MDLs) by analytical laboratories in Southern California.

Applicability of Soil/Fill Material

All analytical data submitted to determine the quality and suitability of the soil/fill material will be reviewed by qualified Port personnel (e.g., Project Engineer/Construction Manager). Meeting the concentration criteria listed in Table 3 is essential for the fill or excavated material to be considered minimally acceptable for industrial use as general fill within the Port. This guidance document and its contents may be amended or updated to reflect future changes in Port policies and/or regulatory requirements. The Port reserves the right to observe contractor's sampling activities and data; and independently sample, analyze, and/or verify the results of any analytical data submitted for evaluation.

The Port will not be responsible for any construction schedule delays or costs if the soil/fill material is rejected due to incomplete or inaccurate data submittals, exceedances of permissible chemical concentrations (i.e., sample results fail to meet the criteria requirements in this section), and/or the soil/fill material does not comply with regulatory requirements (e.g., material would be classified as hazardous wastes, SCAQMD Rule 1166 requirements, UST requirements, site-specific plans or directives, etc.,). If a third-party (e.g., contractor) brings any soil/fill material into the Port that classifies as hazardous waste (i.e., RCRA and non-RCRA), the third party will be considered the generator of the waste. The third-party (contractor) will be responsible for all costs, including costs incurred by the Port, associated with removal and proper disposal of the waste. Further, the third party will also have signatory responsibility for the hazardous waste uniform manifest.

Acronym List

BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
Cal-EPA	California Environmental Protection Agency
CY	Cubic Yard
DTSC	Department of Toxic Substances Control
ELAP	Environmental Laboratory Accreditation Program
EMD	Environmental Management Division
ESL	Environmental Screening Level
LARWQCB	Los Angeles Regional Water Quality Control Board
LRL	Laboratory Reporting Limit
MHHW	Mean Higher High Water
MDL	Method Detection Limit
NELAP	National Environmental Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
POLA	Port of Los Angeles
SCAQMD	South Coast Air Quality Management District
SFRWQCB	San Francisco Regional Water Quality Control Board
STLC	Soluble Threshold Limit Concentration
SVOC	Semi-Volatile Organic Compound
SWRCB	State Water Resources Control Board
TPH	Total Petroleum Hydrocarbons
TTLC	Total threshold Limit Concentration
USEPA	United Stated Environmental Protection Agency
VOC	Volatile Organic Compound

References

Clean Imported Fill Material - http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf

ELAP - http://www.waterboards.ca.gov/drinking_water/certlic/labs/index.shtml

NELAP - http://www.nelac-institute.org/

SW-846 - http://www.epa.gov/osw/hazard/testmethods/sw846/

TPH - http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=423&tid=75

benzene - http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=14

PCBs - http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=26

lead - http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=22

copper - http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=37

20 X TCLP/STLC - http://www.torrentlab.com/torrent/resources/resource/STLC_and_TTLC_Limits.pdf

Laboratory Reporting Limit - http://www.arb.ca.gov/toxics/atcm/asb2atcm.htm

STLC - http://www.eurofinsus.com/media/161417/hazardous_waste_regulatory_limits.pdf

SWRCB - http://www.swrcb.ca.gov/

DTSC - https://www.dtsc.ca.gov/

40 CFR - http://www2.epa.gov/laws-regulations/regulations

HSC - http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=hsc

CCR - https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I77C6B3D0D4BA11DE8879F88E8B0DAAAE&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)

SFRWQCB - http://www.waterboards.ca.gov/rwqcb2/water_issues/programs/ESL/Users_Guide_Dec_2013.pdf

Geotracker - http://geotracker.waterboards.ca.gov/view_documents.asp?global_id=SL377432476&enforcement_id=6041012

LRLs - http://www.mywaterquality.ca.gov/monitoring_council/collaboration_network/docs/bvanbuuren_jan2012.pdf

MDLs - http://water.usgs.gov/owq/OFR_99-193/detection.html

hazardous wastes - https://www.dtsc.ca.gov/HazardousWaste/upload/HWMP_DefiningHW111.pdf

Rule 1166 - http://www.aqmd.gov/home/regulations/compliance/rule-1166-site-specific-and-various-locations-soil-mitigation-plan

UST - http://www.waterboards.ca.gov/ust/

RCRA - http://www.epa.gov/osw/laws-regs/regs-haz.htm

non-RCRA - http://ccelearn.csus.edu/wasteclass/mod7/mod7_03.html

generator - http://www.dtsc.ca.gov/HazardousWaste/Generators.cfm

hazardous waste uniform manifest - https://www.dtsc.ca.gov/IDManifest/upload/HWMP_FS_manifestChanges2.pdf