1. Project Scope of Work

The following items will be part of the scope of work for this project:

Selected consultants may be asked to perform one or more of the following services on an as needed basis. A general description of each activity is provided below and the minimum requirements to provide these services are listed in Section 1.1.

A. Phase I Environmental Site Assessments
B. Phase II Remedial Investigations/Site Characterizations
C. Site Monitoring & Sampling
D. Remedial Feasibility Studies and Action Plans which may include:
    - Fate and Transport Studies
    - Risk Assessment (Health-Based and Ecological)
    - Treatability Studies
    - Interim or Final Remedial Action Work Plans
E. Remedial Actions and Remediation Systems O&M
F. Site Closure Reports
G. Environmental Compliance Assessments
H. Regulatory Agency Coordination and Regulatory Expertise
I. Technical Expertise and Design Services
J. Review of Environmental Documents
K. Litigation Support Services

Some of these services are described in more detail below.

A. <u>Phase I Environmental Site Assessments for Property Acquisitions/Divestitures</u>

As part of the Port's ongoing property acquisition and divestiture programs, Phase I Environmental Site Assessments, following ASTME1527 - 05 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. These assessments must be performed by Environmental Professionals, as defined in ASTME1527, to determine existing environmental conditions as a baseline for new POLA tenants, prior to property acquisition or divestments, and to establish site conditions prior to release of lease from a current tenant. The Port may also conduct Phase I Site Assessments on parcels slated for development. Phase I may include surveys for lead-based paint and/ or asbestos containing material. Based on the findings of these site assessments, further characterization work may be required.

B. Phase II- Remedial Investigations/Site Characterizations

The various activities within the Port which may require remedial investigations/site characterizations include:

- Properties identified in Phase I Site Assessments as having potential contamination.
- Port-owned properties involved in lease renewals and/or terminations.
- Port-owned properties involved in construction projects or site improvements associated with Port development.

Parcels which may require remedial investigations/site characterizations range in size from as small as 5,000 square feet to 300 acres, with an average size of approximately 5 acres. This work is performed in coordination with one or more divisions of the Harbor Department, such as Engineering, Construction, Real Estate, City Attorney, Risk Management, Port Police, Planning & Research, and Marketing Divisions.

Based on historical land uses within the Port area, typical contaminants which may be present in soil and/or groundwater are petroleum hydrocarbons, volatile organic compounds including halogenated volatile organics, and heavy metals (primarily lead, copper, arsenic, and cadmium). The groundwater depth varies from approximately 5 to 25 feet below surface. The direction and gradient of groundwater movement at the investigation sites is variable. The groundwater quality is primarily brackish and considered non-potable. The underlying sediments contain formations from the Quaternary-Recent (Alluvium Formation) which consists of river sands and gravels that occur from the surface to a depth of approximately 200 feet. Some sites may be located on historic dredge material.

Consultant services are requested to perform remedial investigations/site characterizations which adequately define and characterize the nature and extent of soil and/or groundwater contamination that may exist at the project site. Investigations and characterizations must meet requirements of both the Port's site characterization guidelines and the applicable regulatory oversight agencies. The Consultant will coordinate and handle the disposal of all investigation derived waste materials.

Site investigations will be performed using a variety of investigatory techniques including geophysical, soil gas, hand auger, direct push and CPT, soil borings (with concurrent soil logging using USCS protocol), and monitoring well installation and sampling. Field investigations must be designed and directed by either a California licensed Professional Geologist, Professional Engineering Geologist, Certified Hydrogeologist,

or Professional Engineer (PG, C.HG, C.E.G. or PE) with demonstrable experience conducting and overseeing such work.

Soil, groundwater, and soil vapor samples may be collected during the site characterization activities. These samples shall be submitted under chain of custody protocol to a laboratory accredited by the State of California, Department of Health Services to perform analyses per the Environmental Laboratory Accreditation Program (ELAP). Laboratory results must be provided in 5 to 7 business days as the normal turn-around time. Please indicate laboratory surcharges for expedited turn-around time (5 day, 48 hour, and 24 hour).

C. Site Monitoring and Sampling

Scope of work will include but are not limited to well maintenance, additional well installation, quarterly sample collections, and reporting. Sampling activities will be conducted by personnel working under the direct supervision of a California Licensed Professional Engineer (Civil) or Professional Geologist. All samples collected that require analysis will be analyzed by a California certified environmental laboratory with a standard turnaround time of no more than 5 to 7 business days. The consultant will follow protocols set by industry and lead agency standards for collection and analysis of samples. In addition, the consultant must demonstrate knowledge and past experience in collecting soil, soil-gas, sediments, water, and groundwater samples.

D. Remedial Feasibility Studies and Action Plans

The Consultant may be requested to develop remedial feasibility studies and action plans to analyze and evaluate the effectiveness and feasibility of clean-up options for particular sites. This may involve, but not be limited to, the following:

- Fate and Transport Studies.
- Pilot Test Workplans and Treatability Studies.
- Evaluation of remedial action alternatives.
- Recommended remedial action with justification.
- Risk Assessments (health-based and ecological).
- Evaluation of public health and environmental concerns.
- Setting clean-up levels.

Fate and transport studies may include contaminant modeling from soil to groundwater to potential sensitive receptors and from soil to atmosphere to potential sensitive receptors. The Consultant will seek an agreement with the lead agency on the approved modeling approach and software when needed. Using the Conceptual Site Model (CSM), the Consultant will

evaluate whether potential risk to human health and/or the environment exists (i.e., whether there is a complete pathway). Objectives of a human health risk assessment include:

- Evaluation of baseline risks to human health and the environment as compared to potential incremental human health risks from the presence of chemicals of concern.
- Estimation of mass concentrations of chemicals that can remain on site and not pose a statistical threat to protection of human health and the environment.
- Evaluation of existing/potential future risks to on- and off-site human receptors.
- Evaluation and comparison of the potential reduction in risk to human health and the environment from identified remedial alternatives.

If the CSM suggests a complete exposure pathway to ecological receptors, an ecological assessment may be conducted. The ecological assessment can be either a qualitative and/or quantitative appraisal of the actual or potential effects on the environment.

The remedial feasibility studies and action plans should discuss remedial alternatives for the restoration of a site as well as any associated environmental impacts. The plans must adhere to federal and state protocols and shall include the following elements: executive summary; preliminary remedial technology; development of alternatives; evaluation of alternatives; risk assessment; and a remedial/restoration schedule. The plans may also need to consider the full range of clean-up alternatives available from no action to complete removal of contaminated material to achieve background or non-detectable levels. This detailed evaluation should address technical, environmental, public health, institutional, and cost analyses. Remediation alternatives that may be considered include, but are not limited to:

- In-situ Technologies
    - Bioremediation
    - Capping
    - Chemical Dehalogenation
    - Dual Phase Extraction
    - In Situ Flushing/chemical oxidation
    - In Situ Thermal Treatment Methods
    - Monitored Natural Attenuation
    - Permeable Reactive Barriers
    - Phytoremediation
    - Thermal Desorption/Destruction

    - Soil Vapor Extraction and Air Sparging

- Ex-situ Technologies
    - Activated Carbon Treatment
    - Air Stripping
    - Advanced Chemical Oxidation Processes
    - Ion Exchange
    - Incineration
    - Pump and Treat
    - Soil Excavation
    - Soil Washing

The remedial feasibility studies and action plans will be submitted to the Environmental Management Division for review and comment. The Consultant that develops the remediation plan will be precluded from undertaking the actual remediation work, but may also have a role in the remediation management and oversight.

E. Remedial Actions and Remediation Systems O&M

In some projects consultants may be required to conduct removal actions or implement remedial action plans. This may involve excavations, transport and treatment/disposal of contaminated media and/or in-situ treatment of contaminated soil and groundwater.

The consultant must have experience in installation and operations of in-situ soil, groundwater and/or free product remediation systems, and assessment of operation and maintenance (O&M) programs in order to optimize system performance. Experience with implementation of project data management information systems (PDMIS) as applied to remediation systems is desired.

F. Site Closure Reports

A site closure report may need to be developed for submittal to the regulatory agencies. The report should include, but not be limited to, a discussion of the post-closure maintenance and monitoring required to ensure the permanent integrity of the closed site, and a discussion that delineates the specific measures for closing a site in a manner that protects human health and the environment. These reports shall be prepared under the supervision of and signed and stamped by a California licensed PG, C.HG, C.E.G. or PE, or Risk Assessment professional.

G. Environmental Compliance Assessments

The Port may require environmental compliance assessments to be performed on various facilities. The assessment will include, but not be limited to, the following: identification and documentation of compliance status; review of all facility permits; identification of sources of wastes; sampling and analysis of waste products; onsite inspection of facility conditions and practices; review of pertinent facility documents; compliance with environmental provisions in Port leases and tariffs, and recommendations and conclusions regarding areas of environmental concern. Environmental Compliance Audits must be performed under the oversight of a Professional Geologist, Certified Hydrogeologist, or Professional Engineer with at least 10 years of demonstrable environmental experience.

H. Regulatory Agency Coordination and Regulatory Expertise

The Consultant may be requested to identify, meet, and coordinate with local, state, and federal regulatory agencies to procure applicable permits and/or to facilitate the review and approval of remedial investigations/site characterizations, remedial feasibility studies and action plans, risk assessments, site closure reports, waste classifications, and environmental compliance assessments. The Consultant may be requested to provide guidance and expertise regarding applicable environmental rules and regulations pertaining to environmental conditions and issues for a project site, project activity or Port operations. The consultant will demonstrate recent and relevant working experience with the LA-RWQCB, the DTSC (including GSU and HERD groups), the local CUPA, and the SCAQMD.

I. Technical Expertise and Design Services

The Consultant may be requested to provide technical expertise and design services to address or assess potential environmental technologies, alternatives, or impacts involving a broad spectrum of environmental media, involving air quality, water quality, land use, energy, and natural resources.

Tasks may also include design of remediation systems. The design process will include, but is not limited to:

- Pilot System design and testing
- Development of design drawings approved by a qualified California Professional Engineer
- Cost estimation, procurement, and scheduling including applicable permits

- System Construction and Operation
- System Optimization Analysis

The consultant's technical expertise may be requested to assist in development or enhancement of environmental management systems (EMS) or sustainability programs, and to prepare guidance documents for various Port environmental programs. The Consultant may also be asked by the Port to provide defensible estimates of potential site restoration/remediation costs and remediation schedules.

J. Review of Environmental Documents

The Consultant may be requested to review and summarize the findings of reports submitted to the Port, or obtain and review reports in regulatory agency files, involving remedial investigations/site characterizations, feasibility studies, remedial action plans, risk assessments, site closure reports, environmental compliance assessments, contract bid specifications, and other documents.

K. Litigation Support Services

The Consultant may be requested to provide technical support to attorneys in assessing environmental liability (Phase I Environmental Site Assessments, Regulatory Compliance Audits, Health and Safety Audits), supporting challenging regulatory agency negotiations, and supporting litigation. These tasks may involve: assessing environmental damages; designing cost allocations for multi-party concerns; preparing technical positions and expert reports; participating in mediations; providing deposition and/or trial testimony as a testifying and/or non-testifying expert witness; and in critiquing an opposing side's position for National Contingency Plan (NCP) compliance, relative to standard of practice and scientific merit. Experience working with attorneys representing land owners in transactional issues, providing support during deposition, and expert testimony during deposition and trial phases is desired.

1.1 Project Scope of Work Minimum Requirements

SCOPE OF SERVICES	MINIMUM REQUIREMENTS
Phase I – Environmental Site Assessments	Managed by a licensed California Professional Geologist, or Certified Hydrogeologist or Civil Professional Engineer or Registered Environmental Assessor I or II
Phase II – Site Characterizations/Remedial Investigations	Managed by a licensed California Professional Geologist, or Certified Hydrogeologist or Civil Professional Engineer
Site Monitoring and Sampling	Oversight by a licensed Professional Geologist or Civil Professional Engineer
Fate and Transport Studies	Certified Hydrogeologist (C.H.g.)
Risk Assessment (Health Based or Ecological)	Certified Environmental Industrial Toxicologist
Site Closure Reports	Managed and Signed by a licensed Professional Geologist, or Civil Professional Engineer
Environmental Compliance Assessments	Oversight by a licensed Professional Geologist, Certified Hydrogeologist or Civil Professional Engineer
Regulatory Agency Correspondence/Negotiations	Any of the Above and specific to the needs of the project Site