

Zuma Beach, Malibu, CA



SAND COMPATIBILITY AND OPPORTUNISTIC USE PROGRAM FOR LOS ANGELES COUNTY BEACHES

PHASE 1: PLANNING STUDY AND FRAMEWORK REPORT

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Executive Summary

Beach nourishment programs that leverage opportunistically available sand sources, such as those generated from upland land development projects, harbor maintenance dredging projects, and flood control maintenance operations, have been used successfully in Southern California for more than 20 years. In 2006, the California Coastal Sediment Management Workgroup (CSMW) formally developed a Sand Compatibility and Opportunistic Use Program (SCOUP) as part of their Coastal Sediment Management Master Plan. The purpose of SCOUP is to streamline environmental compliance and regulatory approval of relatively small beach nourishment projects (typically up to 150,000 cubic yards per year) using opportunistically available sand sources.

This report summarizes the first of a three-phase project conducted on behalf of the Los Angeles County Department of Beaches and Harbors (LACDBH) to develop and implement a SCOUP Plan for the beaches that are operated and managed by LACDBH. The three project phases are:

- Phase 1:** Outline the “Project Description” and framework for SCOUP implementation. Select five SCOUP “receiver” beaches and identify a range of potential sand sources that can be used for beach sand replenishment efforts.
- Phase 2:** Identify and collect additional data necessary to support environmental review and regulatory permitting efforts. Prepare the environmental documents and submit the permit applications necessary to implement SCOUP projects at LACDBH beaches. Develop implementation guidelines that can be used by County staff to evaluate potential SCOUP projects.
- Phase 3:** Provide ongoing, as-needed support to assist LACDBH in implementing SCOUP projects including pre- and post-construction monitoring.

A critical component of this first phase of the study was to identify five candidate SCOUP receiver sites from among the 18 beaches maintained by LACDBH. The selection process began with an initial screening based on the recently completed *LACDBH Coastal Resiliency Study* (Moffatt & Nichol, 2023a) to determine which beaches were most in need of nourishment, followed by a detailed evaluation of the screened sites for compatibility with a SCOUP plan and final selection of the top five receiver beaches. The highest-scoring sites listed below were selected for inclusion in Phase 2 of the LACDBH SCOUP plan development:

1. Dockweiler State Beach
2. Zuma Beach
3. Redondo Beach
4. Will Rogers State Beach
5. Las Tunas

A high-level overview and initial assessment of potential SCOUP sand sources was prepared for the five candidate receiver sites. Sources within 20 miles of the receiver sites were considered most viable to minimize transportation costs and reduce the overall environmental effects associated with delivering the material to the beach. More distant sources were included to expand potential SCOUP opportunities for LACDBH considering the recent directive from the Los Angeles County Board of Supervisors to place greater emphasis on beneficial reuse of sediment within the region (County of Los Angeles, 2023). Sources considered included dam removal, reservoirs and debris basins managed by the County, local watercourses (rivers, creeks, and streams), lagoons, harbor maintenance dredging, transportation projects, upland development projects, and landslides.

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Acronyms

ASBS	Area of Specific Biological Significance
BEACON	Beach Erosion Authority for Clean Oceans and Nourishment
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CoSMoS	Coastal Storm Modelling System
CSLC	California State Lands Commission
CSMW	Coastal Sediment Management Workgroup
DMMT	Dredge Material Management Team
DPS	Distinct Population Segment
EIR	Environmental Impact Report
ESA	Endangered Species Act
HAPC	Habitat of Particular Concern
IS	Initial Study
ITM	Inland Testing Manual
LACDBH	Los Angeles County Department of Beaches and Harbors
LACFCD	Los Angeles County Flood Control District
LCP	Local Coastal Program
LIDAR	Light Detection and Ranging
MDR	Marina del Rey
MHTL	Mean High Tide Line
MLLW	Mean Lower Low Water
MND	Mitigated Negative Declaration
MPA	Marine Protected Area
MLPA	Marine Life Protection Act

MPRSA	Marine Protection, Research, and Sanctuaries Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic Atmospheric Administration
NOS	National Ocean Service
OPC	Ocean Protection Council
PCH	Pacific Coast Highway
PDO	Pacific Decadal Oscillation
RCDSMM	Resource Conservation District of the Santa Monica Mountains
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SAPR	Sampling and Analysis Plan Results
SCOUP	Sand Compatibility and Opportunistic Use Program
SHS	Sensitive Habitat Surveys
SLR	Sea Level Rise
SMCA	State Marine Conservation Area
SMP	Sediment Management Master Plan
SMR	State Marine Reserve
SPCCP	Spill Prevention, Contaminant, and Countermeasures Plan
SPS	Sediment Placement Site
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution and Prevention Plan
UAV	Unmanned Aerial Vehicle
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VMT	Vehicle Miles Traveled
WDR	Waste Discharge Requirements

Key Terms and Definitions

In the interest of clarity, the following key terms are defined:

- *Beach Nourishment*: The addition of sediment onto or directly adjacent to an eroding beach in an effort to advance the shoreline seaward of its present location (Dean and Dalrymple, 2002). Also referred to as “beach fill” and “beach replenishment.”
- *Beach Profile*: A cross-section through the beach along a given transect alignment (typically perpendicular to the shoreline).
- *Depth of Closure*: The water depth along a beach profile, seaward of which net sediment transport is small or nonexistent (Brutsche *et al.*, 2016). Sand that moves offshore of the depth of closure typically is not considered an active part of the littoral cell.
- *Compatible Source Material*: When the range of grain sizes of a potential sand source lies within the range of grain sizes at the receiver beach.
- *Fine-grained Materials*: Clays and silts, passing the #200 soil grain size sieve, or less than 0.074 mm in diameter. Also referred to as “fines.”
- *Littoral Cell*: A closed coastal compartment or physiographic unit that contains sediment sources, transport paths, and sediment sinks (Inman and Chamberlain, 1960).
- *Opportunistic Sand*: Surplus sand from various source materials, including upland land development projects, harbor maintenance dredging projects, and flood control maintenance operations.
- *Receiver Site*: The location where beach nourishment material is placed. Also referred to as a “receiver beach.”

SAND COMPATIBILITY AND OPPORTUNISTIC USE PROGRAM FOR LOS ANGELES COUNTY BEACHES

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1 Introduction

Throughout the State of California, the sandy beach functions as important natural protection for critical public infrastructure, existing structures, recreational space, and amenities, provides essential coastal habitat, and benefits the local economy. In addition, the beaches in Los Angeles County provide a respite from extreme heat for inland residents, many of whom live in historically marginalized communities; a need that is anticipated to increase as a result of changes to our climate. Beach nourishment, the addition of beach sand and other high-quality beach-compatible sediments to the coast, is a key strategy used by state and local agencies to maintain and enhance this critical resource, address ongoing erosion, and prepare for future challenges associated with climate change.

1.1 Purpose

Nourishment programs that leverage opportunistically available sand sources, such as those generated from upland land development projects, harbor maintenance dredging projects, and flood control maintenance operations, have been successfully used in Southern California for more than 20 years. In 2006, the California Coastal Sediment Management Workgroup (CSMW¹) formally developed a Sand Compatibility and Opportunistic Use Program (SCOUP) as part of their Coastal Sediment Management Master Plan². The purpose of SCOUP is to streamline environmental compliance and regulatory approval of relatively small beach nourishment projects (typically up to 150,000 cubic yards per year) using opportunistically available sand sources.

This report summarizes the first of a three-phase project conducted on behalf of the Los Angeles County Department of Beaches and Harbors (LACDBH) to develop and implement a SCOUP Plan for the beaches that are operated and managed by LACDBH. It is anticipated to be a key element of Los Angeles County's coastal resiliency strategy, consistent with direction from the County Board of Supervisors on November 7, 2023, through the beneficial reuse of sediment,

¹ Coastal Sediment Management Workgroup, https://dbw.parks.ca.gov/?page_id=29239

² California Division of Boating and Waterways, Sand Compatibility and Opportunistic Use Program (SCOUP), https://dbw.parks.ca.gov/?page_id=29355

regardless of the source, at LACDBH maintained beaches (County of Los Angeles, 2023). The three phases of this project are:

- Phase 1:** Outline the “Project Description” and framework for SCOUP implementation. Select five SCOUP “receiver” beaches and identify a range of potential sand sources that can be used for beach sand replenishment efforts.
- Phase 2:** Identify and collect additional data necessary to support environmental review and regulatory permitting efforts. Prepare the environmental documents and submit the permit applications necessary to implement SCOUP projects at LACDBH beaches. Develop implementation guidelines that can be used by County staff to evaluate potential SCOUP projects.
- Phase 3:** Provide ongoing, as-needed support to assist LACDBH in implementing SCOUP projects including pre- and post-construction monitoring.

1.2 Objectives

This report is the culmination of Phase 1. It has been prepared by a multi-disciplinary team of coastal engineers, coastal and marine scientists, and coastal planners from Coastal Frontiers Corporation, Moffatt & Nichol, Rincon Consultants, and Summit Environmental Group working in close collaboration with staff from LACDBH.

Each section of the report addresses one of the following specific goals and objectives:

- Section 2:** Outline the SCOUP process and provide background information regarding its development.
- Section 3:** Summarize the regulatory setting, including agency jurisdiction and the permitting process.
- Section 4:** Outline typical planning-level studies and project-specific monitoring requirements SCOUP projects.
- Section 5:** Summarize the location, characteristics, and dominant shoreline processes at the 18 LACDBH-operated/maintained public beaches.
- Section 6:** Evaluate and rank ten of the beaches most suitable for SCOUP and select the top five beaches for inclusion in Phase 2 of the project.
- Section 7:** Identify potential sources of sediment within a reasonable distance of the selected receiver beaches.
- Section 8:** Identify the next steps to be taken as part of Phase 2.

2 SCOUP Framework

The subsections that follow describe the initial development of SCOUP, key design considerations, and its implementation and practical application used in San Diego County. The SCOUP development for Los Angeles County will follow a similar process.

2.1 SCOUP Development

The concept of SCOUP was first developed in 2006 as a key component of the CSMW and State Department of Boating and Waterways' (now a Division of State Parks) California Coastal Sediment Management Master Plan (SMP) and is well documented in the San Diego Association of Governments (SANDAG) *Final Sand Compatibility and Opportunistic Use Program (SCOUP) Plan* (Moffatt & Nichol, 2006). The SANDAG plan was prepared based on experience gained from prior opportunistic nourishment programs in Ventura County (Moffatt & Nichol, 2001), San Diego County (Moffatt & Nichol, 2000), and Orange County (Moffatt & Nichol, 2002).

A pilot study was prepared as part of the SANDAG Plan whereby the SCOUP framework was applied to the Oceanside Littoral Cell in San Diego County (the Oceanside Cell begins at Oceanside Harbor and ends at the La Jolla Submarine Canyon). Thirteen potential receiver sites were identified, and a site in the City of Oceanside was chosen as the optimum location to receive opportunistic sediment. Following the SCOUP framework, a CEQA Initial Study (IS) and Mitigated Negative Declaration (MND) were prepared to conduct SCOUP projects at the pilot site.

Shortly thereafter, the Cities of Encinitas, Solana Beach, Coronado, and Imperial Beach, working collaboratively with SANDAG, prepared a CEQA IS and MND for five SCOUP sites (EDAW and Moffatt & Nichol, 2008). Each City applied for and obtained necessary regulatory permits from the U.S. Army Corps of Engineers (USACE), California Coastal Commission (CCC), California State Lands Commission (CSLC), and Regional Water Quality Control Board (RWQCB) to conduct SCOUP projects at the selected site(s) for a period of five years. At the end of the permit period, the Cities of Encinitas and Solana Beach chose to renew the SCOUP permits to keep their SCOUP opportunities active and both cities have active SCOUP permits in place as of the date of this report.

SCOUP plans have been developed and implemented in several locations using the CSMW guidance. Regional and local SCOUP plans that have been (or are currently being) developed are listed below. Experience gleaned from these plans provides useful guidance for the present LACDBH effort.

Regional SCOUP Plans

- County of Orange (in development). All beaches in the County will be included as potential SCOUP placement sites.

- Beach Erosion Authority for Clean Oceans and Nourishment (BEACON). The five SCOUP sites within the BEACON region include:
 - Goleta Beach, Goleta
 - Ash Avenue Beach, Carpinteria
 - Surfers Point, Ventura
 - Fifth Street, Oxnard
 - Hueneme Beach, Port Hueneme

Local SCOUP Plans

- City of San Clemente
- City of Oceanside
- City of Carlsbad
- City of Encinitas
- City of Solana Beach
- City of Del Mar
- City of Coronado
- City of Imperial Beach

2.2 SCOUP Design Parameters

Several design parameters were identified as part of the CSMW SCOUP study, including the maximum volume, potential transportation methods, and placement locations.

2.2.1 Maximum Volume

To limit potential impacts and streamline environmental compliance and regulatory approvals, the CSMW recommended that no more than 150,000 cubic yards (cy) be placed at a single SCOUP site per year. Additional restrictions on the permissible volume are included for source material with a high fines content.

2.2.2 Transportation Methods

Given the opportunistic nature of SCOUP, the method used to deliver source material to the receiver site will be determined based on the constraints specific to each project. Potential delivery methods include those traditionally used for beach nourishment (trucking and hydraulic transport), as well as less conventional means.

Material from inland sources, such as development projects or flood control maintenance, will most likely be delivered via truck and spread along the beach using earthmoving equipment

(e.g., bulldozers, loaders, scrapers). Key considerations when using this method are the haul route, ingress and egress points, and the number of truck trips required. Careful attention should be given to minimizing disturbance of residents and fully complying with local ordinances.

In those cases where dredged material is used, the method of delivery will be based on the proximity of the site to the dredging activities and the type of equipment available for the work. Two of the most common methods are to pump the material onto the beach via a connected pipeline and dumping the material into the nearshore zone using a bottom-dump barge or scow.

2.2.3 Placement Location and Timing

The CSMW SCOUP plan identified three placement locations for opportunistically available material:

Beach Berm: Source material placed as a layer over the beach surface.

Surf Zone: Source material placed near the Mean High Tide Line.

Nearshore: Source material placed in the nearshore waters landward of the depth of closure.

A conceptual illustration of each method is provided in Figure 2-1. The Beach Berm method is recommended for high-quality source material with a fines content (percentage of material passing the #200 sieve) less than or equal to 15%. Surf Zone and Nearshore placements are typically used when the fines content of the source material is greater than 15%.

Material should not be placed near sensitive resources (e.g., western snowy plover, tidewater goby, southern California Distinct Population Segment (DPS) steelhead critical habitat, essential fish habitat), within Marine Protected Areas (MPA), or during runs of grunion (March 1 to August 30). Strategies, such as monitoring for grunion eggs, can be employed to avoid impacts during grunion season.

Ideally, placement should occur in the fall and winter months to avoid disturbing beach users during the peak season typically identified as occurring between Memorial Day and Labor Day.

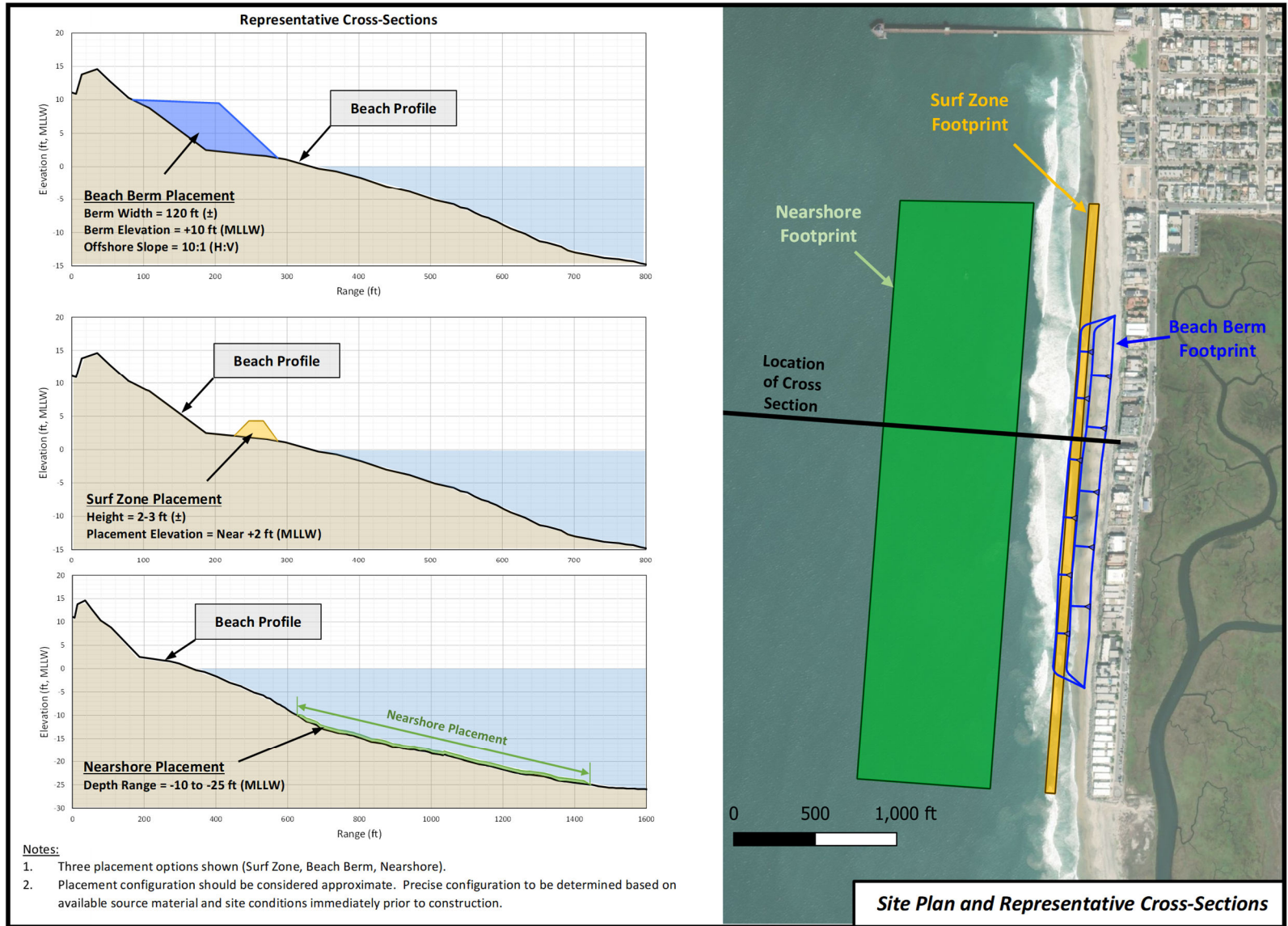


Figure 2-1. Conceptual Illustration of Potential SCOUP Placement Locations

3 Regulatory Permit and Approval Process

This section summarizes the typical regulatory process undertaken to implement a SCOUP plan and identifies the primary considerations for resource agencies with jurisdiction over aspects of beach nourishment projects in California. Typical sampling and monitoring requirements for both approval of a regional SCOUP and local (City) SCOUP projects are outlined below. Recent project experience, along with information presented in the *Final Sand Compatibility and Opportunistic Use Program Plan* (Moffatt & Nichol, 2006) guided the discussion that follows.

3.1 CEQA/NEPA Compliance Process

The first step in implementing a SCOUP plan is to develop the “Project Description” pursuant to the California Environmental Quality Act (CEQA) and possibly the National Environmental Policy Act (NEPA). The Project Description provides the basis for environmental review and impact analyses, and includes the project objectives, locations of the receiver beaches, limits on sediment quantity and quality, stockpile locations, placement methods, haul routes, construction timing, project duration, and identification of required agency permits and approvals.

Once the Project Description is developed, a CEQA Initial Study (IS) is prepared. Based on the prior SCOUP plans described in Section 2, it is likely that a MND will be the CEQA compliance document utilized and there is strong precedent for this approach. It is assumed that Los Angeles County will serve as the CEQA Lead Agency. Mitigation measures may be identified to avoid, minimize, or reduce potential impacts.

3.2 Permit and Approval Requirements

Concurrent with the preparation of environmental compliance documentation, it is recommended that agency permit applications be prepared. Following approval of the Final CEQA document (assumed to be an IS/MND), permit applications from various federal, state, and regional agencies will be submitted and processed by LACDBH. Agencies with jurisdiction over beach nourishment projects in Southern California are listed below. Permits/approvals issued by each agency are specified where applicable.

United States Army Corps of Engineers (USACE)

Role: The primary federal permitting agency responsible for navigation and protection of aquatic resources under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.

Permits: Section 10 and 404 Permits

Notes: Issuance requires USACE to consult with the National Oceanic Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS), and United States Environmental Protection Agency (USEPA). If the action may have effects on a threatened or endangered species, an Incidental Take Statement will be required from the USFWS and/or NMFS as part of a Biological Opinion. The action will be reviewed pursuant to Section 106 and 110 of the National Historic Preservation Act. As part of this process the USACE will consider the effects of the proposed undertakings on historic properties/structures.

United States Environmental Protection Agency (USEPA)

Role: Advises the USACE on compliance with Clean Water Act Section 404(b)(1) guidelines and sediment or water quality impacts to habitat and biological resources. Concurs on Marine Protection, Research and Sanctuaries Act (MPRSA) issues and has joint enforcement authority for the federal Clean Water Act with the USACE

Permits: None

National Marine Fisheries Service (NMFS)

Role: Advises the USACE on issues related to fisheries, such as essential fish habitat protected under the MPRSA and selected endangered species protected under the federal Endangered Species Act (ESA).

Permits: If the action may have effects on ESA-listed species and/or designated critical habitat, a Biological Opinion will be issued.

United States Fish and Wildlife Service (USFWS)

Role: Advises the USACE on issues related to wildlife and fisheries protected by the federal ESA (Section 7 Consultation).

Permits: If the action may have effects on ESA-listed species and/or designated critical habitat, a Biological Opinion will be issued.

California Coastal Commission (CCC)

Role: Enforces consistency with the California Coastal Act and federal Coastal Zone Management Act. Areas of concern include compliance with Certified Local Coastal Program (LCP) policies/regulations, public access, parking and recreation, habitat and biological resources, sediment transport, and water quality.

Permits: Coastal Development Permit (CDP), CDP Waiver or Exemption

California State Lands Commission (CSLC)

Role: State agency with jurisdiction over ungranted submerged lands and tidelands seaward of the Mean High Tide Line (MHTL). Agency concerns are similar to the CCC and include habitat and biological resources, public access and recreation, sediment transport, and water quality.

Permit: Lease of State Lands

Notes: Only required if placement is on ungranted tidelands at or below the MHTL. A MHTL survey must be performed prior to lease approval.

Regional Water Quality Control Board (RWQCB)

Role: State agency tasked with protection of water quality and evaluation of beneficial reuses of sediment.

Permit: Clean Water Act Section 401 Water Quality Certification

Notes: Waste Discharge Requirements (WDRs) may be required when discharging fluidized dredge material.

California State Department of Parks and Recreation (State Parks)

Role: Issues permits for projects located within California State Parks. Primary areas of concern are access and recreation, water quality, sediment transport, habitat, and biological resources.

Permit: Encroachment Permit or Right of Entry Permit

Notes: Required if the receiver site or staging area is located within a State Park or State Beach.

California Department of Fish and Wildlife (CDFW)

- Role:* Advises state agencies on issues related to wildlife and fisheries.
- Permit:* Streambed Alteration Agreement and Endangered Species Act (CESA) incidental take permit, 2081(b)
- Notes:* Streambed Alteration Agreement only required if the receiver site is at or adjacent to an existing river mouth or streambed. CESA incidental take permit only required if there is a likelihood of taking a state listed species. CDFW also regulates activities within Marine Protected Areas (MPAs).

Local Agencies

- Role:* Cities with a Certified LCP can issue a CDP for beach nourishment projects within their jurisdictional boundaries. Local cities also may serve as a Responsible Agency under CEQA. Areas of concern include sediment transport, coastal access and recreation, traffic, air quality, and noise.
- Permit:* Haul Route Permit, Special Use Permit
- Notes:* Not required in all cases. Grading Permit and Coastal Development Permits not required for County-operated/maintained beaches.

3.3 Regulatory Agency Considerations

The SANDAG SCOUNP Plan (Moffatt & Nichol, 2006) describes agency interests related to beach nourishment projects in detail. Key items relevant to the LACDBH SCOUNP Plan are summarized below.

3.3.1 Chemical and Biological Contamination

Source material used for beach nourishment must be substantially free of chemical and biological contamination. Testing is required to demonstrate a source is “substantially free of contaminants.” An exception may be granted if (1) the source material is composed of sand, gravel, or other inert substance, and found in an area of high current or wave energy, or (2) if previous testing and information on past land use demonstrate that the material is isolated from sources of contamination.

3.3.2 Sediment Grain Size

The grain size of potential nourishment material must be similar to the receiver site to avoid impacts to habitat, bottom-dwelling organisms, and aquatic plants such as eelgrass, surfgrass, and kelp.

3.3.3 Color

The color of the source material must “reasonably match” the color of the receiving beach after reworking by waves. This is primarily for aesthetic reasons and is more likely to generate public comment than concern from the permitting agencies.

3.3.4 Particle Shape

Use of natural sand, rather than manufactured material, is recommended for beach nourishment projects based on the observation that the rounded particles are considered more comfortable to recreational users. The use of manufactured sand is discouraged, as it may irritate recreational users and inhibit colonization of interstitial flora and fauna.

3.3.5 Turbidity

Turbidity is associated with several negative impacts to biological organisms, including the foraging ability of fish and birds, the ability of sensitive flora to photosynthesize, and the ability of filter feeding invertebrates to remain free from obstruction. These impacts are most likely to occur when turbidity levels exceed those that occur naturally over long periods of time. Brief, local increases in turbidity are not expected to negatively impact organisms in the area. For this reason, sites that are proximate to natural sources of sediment delivery (e.g., river mouth, stream) are preferred, as elevated turbidity levels are common in these areas.

3.3.6 Burial

Burial of marine resources can occur within the receiver site footprint, or downdrift as the material is transported along the coast. Negative impacts associated with burial include mortality of organisms that cannot readily move (e.g., surfgrass, eelgrass, kelp, Pismo Clams). Typically, the SCOUN receiver sites are located sufficiently far enough away from sensitive resources to bring any impacts below the level of significance.

3.3.7 Debris and Gravel/Cobble

Source material must be generally free of trash, debris, and large fragments of organic material (e.g., tree limbs, shrubs) that can cause health and safety issues, odors, or visual impacts to beach users. Gravel is not acceptable, but rounded cobble in the source material may be acceptable if there is existing native cobble on the receiver beach.

3.3.8 Hard Pan

Source material that forms a hardpan can only be placed in the surf zone.

3.3.9 Location and Timing

Receiver sites should provide for public beach access, be located away from sensitive resources, and timed so that construction activities do not occur during grunion runs, nesting of relevant threatened or endangered species, runs of Pacific Salmon and Steelhead Trout, and periods when recreational use is high.

3.3.10 Placement Rate

The rate at which the source material is placed on the beach should be controlled such that turbidity levels and adverse impacts to air quality, traffic, public safety, and noise are minimized.

4 Technical Studies and Monitoring Requirements

A variety of technical studies and project-specific monitoring programs are needed to demonstrate compliance with all regulatory requirements, including those of CEQA and NEPA. These can generally be segregated into those that are necessary to develop the SCOUP program (“planning studies”), and those that occur as part of each individual SCOUP project (“project-specific monitoring”). Each is described in the subsections that follow. It should be noted that the specific requirements for LACDBH’s plan will be determined as part of the regulatory process (Phase 2).

4.1 Planning Studies

To develop the environmental documentation necessary for approval of a regional SCOUP plan, the following studies generally are required.

4.1.1 Receiver Site Sediment Characterization

The sediment at each proposed receiver site must be characterized prior to approval of the overall SCOUP plan. Doing so allows potential sources to be judged as compatible or not compatible with the sediments naturally occurring at the site.

In most cases, surficial sediment samples (samples of the beach surface) are obtained along at least two representative transects at the receiver site and tested for grain size. In those cases where the receiver site is more than one mile long, additional transects should be included at 0.5-mile intervals. Sampling typically occurs at elevations of +12 ft, +6 ft, 0 ft, -6 ft, -12 ft, -18 ft, -24 ft, and -30 ft, relative to National Ocean Service (NOS) Mean Lower Low Water (MLLW).

Each sample should be analyzed for grain size using a minimum of ten sieves ranging from #4 (coarse material) to #200 (fine material). Wash testing of material finer than the #200 sieve is not necessary. In addition to reporting the gradation curve for each sample, a “composite” gradation curve should be prepared that represents the range of sediment sizes naturally occurring at the site. The composite curve can be used to judge a potential source as being compatible or not compatible with the receiver site.

Chemical testing of the receiver site typically is not required; however, in some cases chemical testing may be warranted to determine if the receiver site sediments naturally contain contaminants above a level of concern.

4.1.2 Beach Profile Survey

A beach profile survey is needed at each receiver site to develop the design cross section and footprint for the proposed placement methods. The survey should include measurements of the beach elevation along one or more representative shore-perpendicular transects within the estimated fill footprint and extend from the landward limit of the sand past the presumed depth of closure. In most Southern California locations, beach profile surveys extend to a depth of 40 to 50 ft below NOS MLLW. It should be noted that beach profile surveys have historically been conducted in Los Angeles County by the USACE and others (including Coastal Frontiers Corporation). These organizations should be consulted to determine if the existing information is available.

4.1.3 Mean High Tide Line Survey

Prior to the initiation of a project, the Lease of State Lands requires a Mean High Tide Line survey to be conducted by a Professional Land Surveyor licensed in the State of California. The survey is necessary to establish the limit of state jurisdiction and as such is considered a legal boundary survey.

4.1.4 Sediment Budget (Demonstration of Need)

A sediment budget for the region encompassing the receiver sites provides value and justification for proceeding with the development of SCOUP. Sediment budgets prepared as part of recent studies can be used for this purpose, such as the Griggs and Patsch (2018) study described in Section 5.

4.1.5 Traffic Study/Vehicle Miles Traveled (VMT) Analysis

A traffic control plan for each receiver site is necessary to evaluate impacts on air quality, public safety, and noise. As the precise location of source material is not known prior to approval of the SCOUP plan, the traffic study should include representative routes of ingress and egress that can be refined prior to construction and will need to include generalized assumptions about the number and length of vehicle trips.

4.1.6 Air Quality and Greenhouse Gas Analyses

Air Quality and Greenhouse Gas analyses are required to support the preparation of the environmental documentation for compliance with CEQA and NEPA (if required). Typically, such studies rely partly on data generated by the traffic/VMT analyses described above.

4.1.7 Biological Resources Assessment

An assessment of the existing biological resources at the receiver sites is required to determine if resource impacts are anticipated, whether any constraints should be placed on the location or timing of SCOUP projects, and what monitoring requirements should be established.

4.1.8 Public Access

Plans to maintain public beach access during construction of SCOUP projects should be developed, as this will be required by the CCC as part of CDP approval.

4.2 Project-Specific Monitoring Requirements

Based on our team’s experience implementing SCOUP and other beach nourishment projects in Southern California, monitoring is anticipated to be required prior to, during, and following each SCOUP project. The following subsections outline the anticipated requirements.

4.2.1 Sampling and Analysis Plan

A Sampling and Analysis Plan (SAP) for tiered testing will be required to be approved by the Dredge Material Management Team (DMMT) prior to each SCOUP project, pursuant to the USEPA and USACE *Inland Testing Manual* (1998). As noted in Section 3.3, the purpose is to confirm that the source material is free from contaminants and is compatible with the receiver site. The SAP must be reviewed by the USACE, USEPA and RWQCB for concurrence prior to execution. Once concurrence is received, sampling can be conducted, and the results provided in a SAP Results (SAPR) report.

Per the SANDAG SCOUP Plan (Moffatt & Nichol, 2006), the SAP should contain the following information:

- Tier I Information:** Site history, current site use, potential sources of contamination, and past permitting.
- Project Description:** A plan map and cross-sections of the source site, type and volume of sediment to be removed, and methods and equipment to be used.
- Sampling Plan:** Proposed plan for sediment removal, allocation of field samples, and compositing.

Sampling Procedures: Sampling schedule, sampling technology, positioning methodology, sample collection, logging and handling protocols, sample extrusion and compositing, and sample transport and chain of custody.

Testing Plan: Grain-size analyses, physical properties for compatibility, chemicals of concern, analytical methods, holding time requirements, and quality assurance requirements. Biological testing may be required in selected instances.

Responsibilities: Individual roles and responsibilities (to be determined by LACDBH).

All sampling should be conducted such that the material sampled is representative of the source, reflecting volume, homogeneity, pollutants, etc. (Moffatt & Nichol, 2006). At least two samples must be obtained in each non-contiguous excavation area and at least three samples are required per acre. In all cases, the cores should extend from the surface to a depth of at least 2 ft below the planned excavation limit. All material from the individual borings must be collected and gross manipulation should not occur (*e.g.*, to remove fines, organic matter, or debris) prior to analysis. Sub-samples should be collected from each core at near-surface, mid-depth, and the bottom of the boring. A bulk sample also should be collected from the entire core.

The sampling scheme (systematic or random) will depend on the source. Where potential contaminants are present, systematic sampling is preferred; however, an even sampling distance is not required. Random sampling, which is typically less expensive than systematic sampling, is appropriate for sources that clearly are not contaminated and do not require strategic characterization.

Tests for both physical and chemical properties shall be conducted. Physical testing should include sediment gradation and tests for compaction, such as the Atterberg test. Chemical testing should be performed in almost all cases, particularly when there is reason to believe contamination is present. The Tier I research performed in preparation of the SAP should establish the target list of analytes to be included in the testing. A master list is included in the ITM (USEPA and USACE, 1998). The testing methods used for the source material should mirror those used for the receiver site (*e.g.*, the number and range of sieves used).

Appendix A provides a recent SAP and a SAPR prepared for the Solana 101 Mixed-Use Project in Solana Beach, CA. The project was conducted as part of the City of Solana Beach SCoup plan and can be used as a guide for preparation of SAPs and SAPRs in Los Angeles County.

4.2.2 Beach Profile Monitoring

Beach profile monitoring has been required prior to and following SCOUP projects to document the placement and dispersal of the source material, and potential impacts to adjacent beaches. The surveys typically include the transect used for the receiver site characterization (Section 4.1.1 and 4.1.2) and at least one upcoast and one downcoast site. Transects used historically by the USACE and others are preferred for context.

One pre-construction, and three post-construction surveys typically are required: up to one-year prior to construction, immediately following construction (typically within two weeks of completion), at six months after construction, and at one year after construction.

4.2.3 Water Quality Monitoring

As noted in Section 3.3.5, increased turbidity resulting from the suspension of fine material within the water column can impact biological resources in the area. Visual observations typically are required during construction to ensure that turbidity levels do not significantly exceed those that occur naturally in the area. If monitoring indicates that turbidity levels have exceeded the ambient level at more than one half mile from the receiver site for a period of five days or more, then placement should be halted or modified to reduce turbidity.

In addition, a Stormwater Management Plan (SWMP), Stormwater Pollution and Prevention Plan (SWPPP), and Spill Prevention, Contaminant, and Countermeasures Plan (SPCCP) typically are prepared as part of the pre-construction planning process.

4.2.4 Surf Monitoring

If a receiver site is located near an established surfing spot, surf monitoring may be required to verify that the project does not adversely impact surf quality. A variety of approaches have been used in the past. Visual observations and discussions with local surfers prior to and following construction were used in San Diego County and video-based surf monitoring is being utilized for the San Clemente and Solana Beach USACE beach sand projects. Additionally, surf groups have advocated for monitoring to be conducted using location-tracking surf watches that are synchronized with land-based cameras (like those operated by Surfline).

4.2.5 Sensitive Habitat Monitoring

In those cases where a receiver site is located near sensitive habitat, such as sensitive bird species nesting or foraging habitat, designated critical habitat, essential fish habitat (e.g., eelgrass beds, kelp canopy, rocky reefs), or grunion habitat, pre- and post-project Sensitive Habitat Surveys (SHS) are likely to be required as a condition of the permit. The SHS typically consists

of biological reconnaissance surveys which may include scientific divers conducting surveys in the intertidal and nearshore subtidal areas to document special status species. SHS surveys may also include mapping of beach features utilizing Unmanned Aerial Vehicle (UAV) imagery or sonar to document the extent of rocky intertidal and subtidal reefs, surfgrass, eelgrass, and kelp canopy. Depending on the size of the project and sensitivity of the habitat, surveys may be required for periods of up to five years. Grunion monitoring typically includes pre-project assessment of the suitability of the receiver beach to host a grunion run. If found not to be suitable, then the project may proceed without further monitoring. If determined to be suitable for a run, then grunion monitoring of the beach during runs will be required for the duration of the placement.

4.2.6 Traffic and Public Safety Monitoring

A traffic control plan must be prepared for each receiver site and refined prior to approval of each SCOUP project. The plan should clearly identify the haul routes to be used and provide for the safety of pedestrians at the receiver site and along the route. Public streets used for hauling shall be cleaned, as necessary, by street sweeper. The Traffic Study prepared as part of the SCOUP Plan (Section 4.1.5) should be used as a starting point to verify traffic impacts are minimized and public safety considerations are included in the project design.

5 Los Angeles County-Operated Beaches

LACDBH operates and maintains 18 public beach facilities between northern Malibu and the San Pedro neighborhood of Los Angeles. This section presents an overview of the region and the coastal processes that drive shoreline changes in the area. The beaches are delineated from north to south in Table 5-1 and their locations are shown in Figure 5-1. Maps prepared by the County (2016) illustrating the precise location and amenities provided at each beach are included as Appendix B.

5.1 Regional Overview and Planning Context

LACDBH beaches generally fall within three sub-regions: Malibu, Santa Monica Bay, and Palos Verdes Peninsula (Noble, 2016; Noble and Larry Paul, 2017). A description of each region is provided below.

5.1.1 Malibu Region

The Malibu Region extends from the Los Angeles County - Ventura County line in the north to Topanga Canyon in the south and generally consists of narrow, crescent-shaped beaches bounded by rocky headlands (Figure 5-1). For the most part, beaches in this 25-mile long region face south and are relatively narrow compared to other LACDBH beaches; however, wider stretches of beach are present at Zuma Beach (Photo 5-1) and near the mouths of Malibu Lagoon and Topanga Canyon.

LACDBH operates eight beaches in the Malibu region, including Nicholas Canyon, Zuma Beach, Point Dume, Latigo Shores, Dan Blocker, Malibu Surfrider, Las Tunas, and Topanga Beach.

5.1.2 Santa Monica Bay Region

The Santa Monica Bay region is 20 miles long and extends from Santa Ynez Canyon (immediately east of Topanga Beach) in the north to the Palos Verdes Peninsula in the south (Figure 5-1). Beaches in this area generally face southwest and are backed by cliffs at both the north and south ends. Past projects, including beach nourishment, harbor construction, and the construction of sediment retention structures, have significantly impacted the shoreline in this region, resulting in artificially wide beaches in most areas (Photo 5-2). The most prominent coastal structures are the breakwaters that form the entrances to Marina del Rey (MDR) and King Harbor, and the Santa Monica and Venice breakwaters.

LACDBH operates seven beaches within this region, including Will Rogers State Beach, Venice Beach, Dockweiler State Beach, Manhattan Beach, Hermosa Beach, Redondo Beach, and

Torrance Beach. An eighth County-operated beach is located inside Marina del Rey (Marina Beach).

Table 5-1. Beaches Operated & Maintained by Los Angeles County

Name	Owned By	Operated By	Region	Littoral Cell
Nicholas Canyon County Beach	County	LACDBH	Malibu	Zuma
Zuma Beach	County	LACDBH	Malibu	Zuma
Point Dume Beach	County	LACDBH	Malibu	Zuma
Latigo Shores Beach	County	LACDBH	Malibu	SM
Dan Blocker Beach	County	LACDBH	Malibu	SM
Malibu Surfrider Beach	County	LACDBH	Malibu	SM
Las Tunas Beach	County	LACDBH	Malibu	SM
Topanga County Beach	County	LACDBH	Malibu	SM
Will Rogers State Beach	State	LACDBH	SM Bay	SM
Venice Beach	City of LA	LACDBH	SM Bay	SM
Marina Beach	County	LACDBH	SM Bay	SM
Dockweiler State Beach	State	LACDBH	SM Bay	SM
Manhattan Beach	County	LACDBH	SM Bay	SM
Hermosa City Beach	City of HB	LACDBH	SM Bay	SM
Redondo Beach	County	LACDBH	SM Bay	SM
Torrance Beach	County	LACDBH	SM Bay	SM
Royal Palms County Beach	County	LACDBH	PV Pen.	- ⁴
White Point County Beach	County	LACDBH	PV Pen.	- ⁴

Notes:

1. Source: *Beach Facilities Maps* (County of Los Angeles, 2016).
2. Abbreviations: LA (Los Angeles), HB (Hermosa Beach), LACDBH (Los Angeles County Department of Beaches and Harbors), SM Bay (Santa Monica Bay), PV Pen. (Palos Verdes Peninsula), SM (Santa Monica).
3. Not all facilities are maintained by LACDBH. See *Beach Facilities Maps* for further detail.
4. Not defined as a littoral cell. Beaches in this area are highly compartmentalized and generally stable.

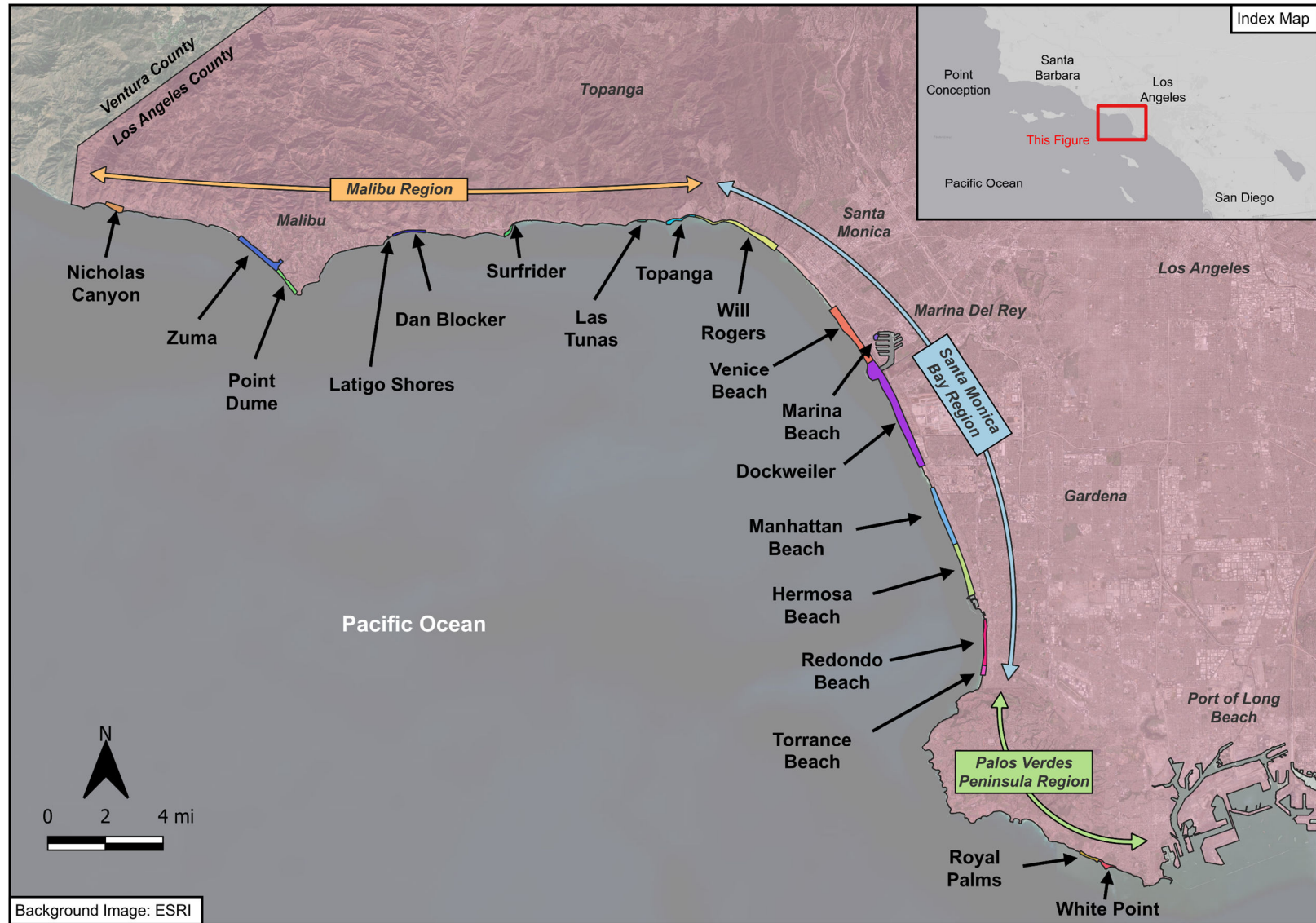


Figure 5-1. Los Angeles County-Operated & Maintained Beaches and Coastal Regions



Photo 5-1. Malibu Shoreline looking west from Point Dume Beach to Zuma Beach



Source: Noble, 2016

Photo 5-2. Santa Monica Bay Shoreline looking north from Venice Beach

5.1.3 Palos Verdes Peninsula Region

The Palos Verdes Peninsula Region is approximately 16 miles long and extends from the south end of Torrance Beach to the Port of Long Beach (Figure 5-1). The shoreline in this area consists of narrow, rocky, pocket beaches backed by cliffs that are up to 150-ft high (Photo 5-3; Noble, 2016). Shoreline changes in this region tend to be small and related to landslides emanating from the cliffs, rather than from oceanographic processes. The County operates and maintains two beaches in this region: Royal Palms and White Point.



Photo 5-3. Palos Verdes Peninsula Shoreline looking North

5.2 Littoral Cells

The quantification of coastal processes and sediment transport (sand movement) along the California coast is based primarily on the concept of littoral cells, or beach compartments, and provides a valuable beach and shoreline planning framework. A littoral cell is a closed coastal compartment or physiographic unit that contains sediment sources, transport paths, and sediment sinks (Inman and Chamberlain, 1960). A budget of sediment may be developed for a littoral cell to evaluate and interpret coastal sedimentation and overall shoreline stability. This conceptual model applies the principle of conservation of mass to the fluxes of sediment into and out of the

littoral cell. Accretion occurs if the balance is positive (*i.e.*, more sand is entering the littoral cell than leaving it), while erosion occurs if the balance is negative (*i.e.*, more sand leaving the littoral cell than entering it).

Griggs and Patsch (2018) identified two littoral cells between Malibu and the Port of Long Beach (Figure 5-2): the Zuma Cell and the Santa Monica Cell. The region between the Santa Monica and San Pedro Cells was not defined as a littoral cell, given that beaches in this area are highly compartmentalized and generally stable, with little sediment transport along the shoreline.

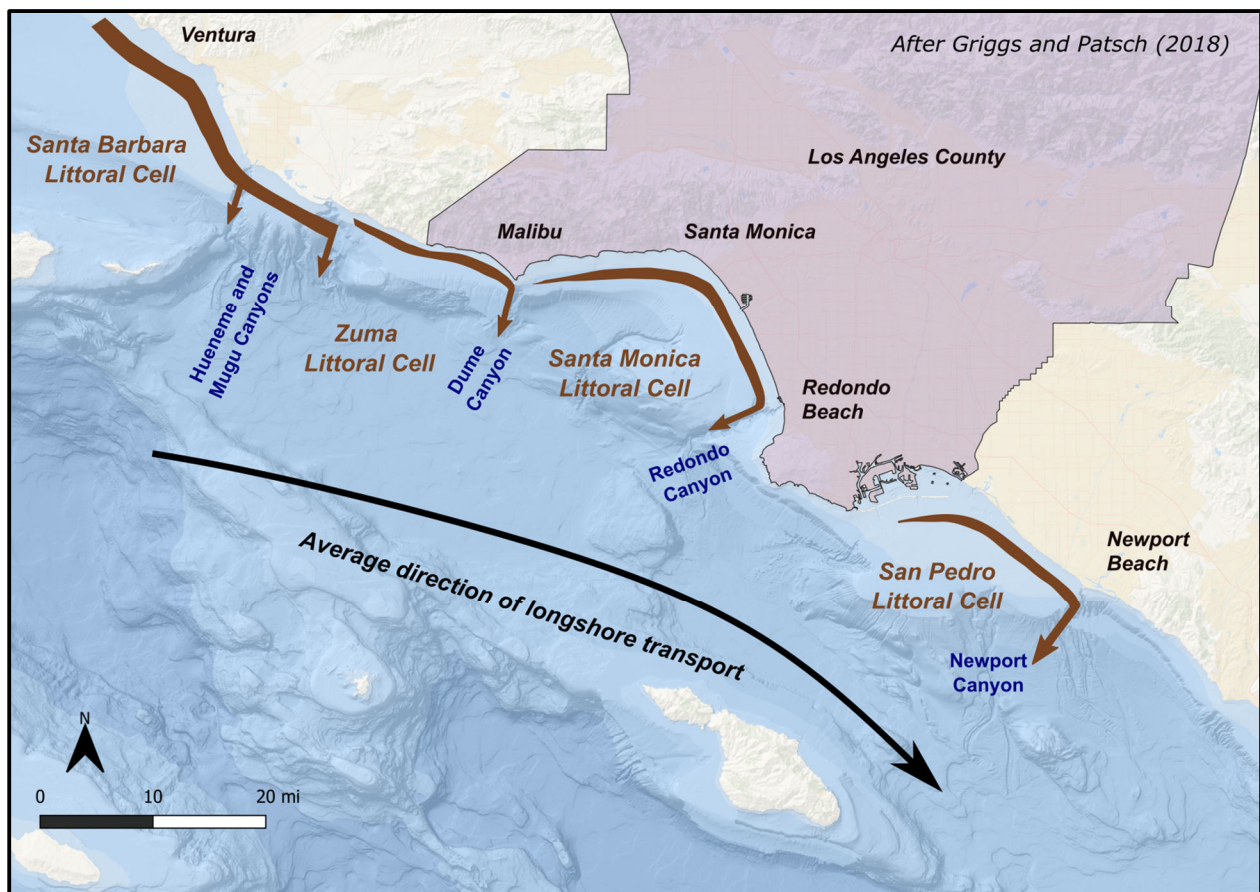


Figure 5-2. Regional Littoral Cells

Sediment transport within both the Zuma and Santa Monica Cells is bidirectional and varies in accordance with seasonal changes in swell direction. The net direction of transport is from west to east in the Zuma Cell and from north to south in the Santa Monica Cell. The cells begin and end at nearshore submarine canyons (Figure 5-2), which intercept some or all sediment travelling along the coast and transport it downslope into deep water where it is effectively removed from the system.

5.2.1 Zuma Littoral Cell

The Zuma Littoral Cell begins at the Hueneme and Mugu Submarine Canyons and extends east to the Dume Submarine Canyon. The primary sources of sediment within the cell include contributions from bluff erosion as well as small streams and creeks. Historically, sediment would bypass the head of Mugu Canyon and be transported into the Zuma Cell from the west; however, Griggs & Patsch (2018) cite that onshore migration of the head of the Mugu Submarine Canyon has significantly reduced this source of material, leading to a deficit of sediment within the littoral cell.

Beach widths within the Zuma Littoral Cell are generally characterized by short-term periods of erosion during intense storm events and decadal changes that vary in accordance with the Pacific Decadal Oscillation (PDO). During warm phases of the PDO, beaches within the Zuma Cell tend to erode, while beaches tend to accrete during the cool phase (Griggs and Patsch, 2018).

5.2.2 Santa Monica Littoral Cell

The Santa Monica Littoral Cell begins at Dume Submarine Canyon and ends at Redondo Submarine Canyon (Figure 5-2). The Santa Monica Submarine Canyon does not act as a sink, as the head of the canyon is located well offshore and more than six miles from the beach.

Presently, the primary natural sources of sediment within the Santa Monica Cell are the coastal bluffs. Sediment delivery from creeks and streams largely has been eliminated by dams constructed within the Malibu Creek Watershed, with the Rindge Dam being the largest (Griggs and Patsch, 2018). This reduction in natural sediment delivery caused beaches in the northwestern portion of the Santa Monica Cell to become narrow and sand retention structures, including 33 groins, were built to stabilize the shoreline along the Topanga Beach and Will Rogers section of western Santa Monica Bay. Many of these structures are now either buried, severely damaged, or destroyed (Patsch and Griggs, 2007). The Will Rogers groin field is an exception, as it continues to provide effective sand retention to artificially widen an otherwise narrow stretch of coast.

East and south of Will Rogers, beaches are much wider, reflecting the significant quantities of sand that have been delivered to the coast via beach nourishment projects. Since 1926, over 31 million cy of sand has been placed on Santa Monica Bay beaches (Leidersdorf *et al.*, 1994), most of which was derived from major coastal infrastructure construction projects, such as the Hyperion Sewage Treatment Facility and Pacific Coast Highway (PCH). In recent decades, the absence of similar large-scale public infrastructure projects has led to a significant decrease in the frequency and volume of beach nourishment activities in Santa Monica Bay.

6 SCOUP Receiver Site Selection

A critical component of this phase of the study is to identify five potential SCOUP receiver sites from among the 18 beaches maintained by LACDBH. The selection process began with an initial screening to determine which beaches were most in need of beach nourishment, followed by a detailed evaluation of the screened sites for compatibility with the LACDBH SCOUP plan and final selection of the top five receiver beaches.

6.1 Initial Screening

The initial screening of LACDBH-maintained beaches was based on a vulnerability assessment recently completed as part of the *LACDBH Coastal Resiliency Study* (Moffatt & Nichol, 2023a). As part of the study, the 18 LACDBH beaches were ranked according to their present vulnerability to coastal hazards, as well as their future vulnerability to sea level rise.

6.1.1 Present Vulnerability

The present vulnerability of each site was evaluated based on the physical condition of the beach (e.g., width, erosion rate), the type and number of amenities provided, the level of public use, and communities served. A variety of data sources were used in the assessment, including publicly available topographic survey data, county records, site visits by the project team, and beach use data obtained by County Lifeguards.

Physical Condition: Assessed through examination of high-resolution coastal LiDAR data from 2009 and 2016 (NOAA, 2022). The average beach width, minimum beach width, and erosion rate were computed using each data set.

Amenities: Cataloged during site visits and through discussions with LACDBH staff. Amenities include restrooms, bike paths, picnic tables, beach volleyball courts, piers, snack bars/concessions, lifeguard buildings, fire pits, basketball courts, promenades, surf breaks, fishing, ecological attractions, maintenance yards, youth centers, and family friendly amenities.

Public Use: Quantified through beach attendance and the social vulnerability of populations in the surrounding areas. Beach attendance data was provided by Los Angeles County Lifeguards and social vulnerability was based on data from the U.S. Centers for Disease Control Social Vulnerability Index.

6.1.2 Future Vulnerability

The vulnerability of each site to future sea level rise was assessed using the currently accepted planning guidance for the State provided in the Ocean Protection Council’s (OPC) *State of California Sea-Level Rise Guidance, 2018 Update* (OPC, 2018) and results from the *Coastal Storm Modelling System (CoSMoS) Version 3.0, Phase 2* (Barnard *et al.*, 2018). The medium-high risk aversion scenario was adopted, as it is recommended for use in more vulnerable projects or populations that will experience significant consequences if coastal hazard impacts occur. Time horizons of 2050 and 2070 were selected, resulting in SLR projections of 0.50 m (1.6 ft) and 1.0 m (3.3 ft), respectively. Estimated shoreline positions from the two sea level rise scenarios were obtained via CoSMoS and reviewed to determine the degree to which the recreational area and public amenities would be impacted. In the interest of conservatism, beach nourishment was assumed to cease, and the shoreline was allowed to retreat past existing shoreline armoring.

It should be noted that the 2018 OPC SLR Guidance is currently being updated based on the 2022 NOAA SLR projections (Sweet *et al.*, 2022) and the recently released Fifth National Climate Change Assessment (Jay *et al.*, 2023). Thus, future SLR projections are anticipated to continue to evolve as our understanding of the complex interplay of climate change variables and scenarios deepens.

6.1.3 Vulnerability Score and Ranking

A weighted decision matrix was used to score each site based on the data described above. The categories and weights are shown in Table 6-1 and the results, sorted from most vulnerable to least vulnerable, are shown in Table 6-2.

Table 6-1. Weighting Factors for Vulnerability Decision Matrix

Category	Weight
Existing Physical Condition	50%
Future Physical Condition	10%
Resources and Amenities	20%
Use	20%

Source: LACDBH Coastal Resiliency Study, Phase 2 (Moffatt & Nichol, 2023a).

Table 6-2. County-Maintained Beaches ranked from Most to Least Vulnerable

	Beach	Total Score	Ranking
↑ More Vulnerable	Zuma	76.0	1
	Redondo	74.3	2
	Malibu Surfrider	71.9	3
	Point Dume	70.1	4
	Dockweiler	68.0	5
	Dan Blocker	67.4	6
	Las Tunas	66.0	7
	Topanga	61.1	8
	Nicholas Canyon	60.1	9
	Will Rogers	58.3	10
↓ Less Vulnerable	Manhattan	58.2	11
	Latigo Shores	57.6	12
	Venice	56.5	13
	Torrance	55.1	14
	Hermosa	47.8	15
	Royal Palms	45.4	16
	Marina Beach	44.9	17
	White Point	42.4	18

Note:

1. Source: *LACDBH Coastal Resiliency Study, Phase 2* (Moffatt & Nichol, 2023a).

6.2 SCOUP Evaluation

The 10 most vulnerable sites from the *LACDBH Coastal Resiliency Study* were selected for more detailed evaluation. A decision matrix was developed using twelve criteria, weighted based on their relative importance, that reflect both the potential benefits of SCOUP activities and the possibility of adverse effects. The 10 LACDBH beaches were scored using the criteria and a simple three-point scale. The scores then were weighted, summed, and normalized such that the final scores range from 0.33 (worst candidate) to 1.0 (best candidate). The criteria are described below.

Potential Benefits

Vulnerability: The vulnerability of the site to existing coastal hazards and future sea level rise was estimated using the results of the *LACDBH Coastal Resiliency Study* described in

Section 6.1. Those sites that are most vulnerable are assumed to benefit most from inclusion in the SCOUP plan.

- Scoring: (1) Least Vulnerable, (2) Vulnerable, (3) Most Vulnerable
- Weight: 15%

Construction Feasibility: The sites were reviewed to determine if the beach can be accessed via truck easily and if potential stockpile and staging areas are located nearby.

- Scoring: (1) Challenging, (2) Feasible, (3) Highly Feasible
- Weight: 20%

Support from the Local Community: Past experience was used to estimate if the local community is likely to support beach nourishment at each potential receiver site. Those where opposition is likely to occur were considered to be poor candidates for SCOUP.

- Scoring: (1) Likely to Oppose, (2) Unknown, (3) Likely to Support
- Weight: 5%

Existing Natural Sediment Delivery: Sites near natural sources of sediment delivery, such as rivers or creeks, typically are strong candidates for beach nourishment, as the coastal system in these areas already experiences elevated turbidity levels and sedimentation. The candidate SCOUP receiver beaches were reviewed to determine if any are located near natural sediment sources.

- Scoring: (1) None, (2) Minor Source, (3) Major Source
- Weight: 5%

Benefit Adjacent Beaches: Sites that can supply sediment to downcoast beaches are more advantageous than those located near the end of the littoral cell, as the sediment added via SCOUP should remain in the littoral system for a longer period of time. The receiver sites were reviewed to determine the degree to which they are likely to benefit adjacent beaches. Since transport in the Zuma and Santa Monica Littoral Cells is bidirectional, both up and downcoast beaches were considered. In addition, it was assumed that sediment from the Zuma Littoral Cell can be transported past Point Dume and into the Santa Monica Littoral Cell.

- Scoring: (1) No Benefit, (2) Some Benefit, (3) Significant Benefit
- Weight: 5%

Sand Retention : The potential receiver sites were reviewed to determine if sediment typically is retained in the area either by natural or man-made features. Those with sediment retention are more suitable for SCOUP given that the opportunistic material should not disperse as quickly as it would at other locations.

- Scoring: (1) No Retention Exists, (2) Partial Retention Exists, (3) Retention Exists
- Weight: 5%

Historic Receiver Site: Sites used for prior beach nourishment projects are likely to have existing baseline data from which to assess potential impacts, thereby reducing the type and quantity of new data necessary for environmental review. As a result, such sites were considered to be more favorable than those where nourishment has not taken place.

- Scoring: (1) No, (3) Yes
- Weight: 5%

Potential Effects

Proximity of Haul Route and/or Construction Site to Residences: Potential haul routes in the immediate vicinity of the receiver beaches were identified. Sites with routes close enough to local residences to cause a disturbance were scored lower than those where the haul routes were either far from residences, or near to existing sources of road noise, such as a major highway.

- Scoring: (1) Likely Disturbance, (2) Possible Disturbance, (3) Unlikely Disturbance
- Weight: 15%

Intertidal/Offshore Habitat and Biological Resources: Publicly available resource maps were reviewed to identify sensitive habitat and biological resources near to each potential SCOUP receiver site. Sites with extensive sensitive habitat were scored lower than those with sparse sensitive habitat based on the likelihood that the SCOUP activities may impact these resources.

- Scoring: (1) Extensive Habitat, (2) Some Habitat, (3) Sparse Habitat
- Weight: 10%

Recreation and Surfing: In some cases, beach nourishment can negatively impact recreation and surfing by decreasing the quality of the experience during or shortly after completion of construction. Potential SCOUP receiver sites located near to popular surfing locations received a lower score.

- Scoring: (1) Likely to Impact Surfing, (3) Not Likely to Impact Surfing
- Weight: 5%

Creek and River Mouths: While in many cases, locating receiver sites near natural sources of sediment delivery is advantageous, potentially negative impacts can occur when sedimentation causes creeks, rivers, or nearshore lagoon entrances to close. Potential SCOUP receiver sites located near to these features received a lower score to reflect this possibility.

- Scoring: (1) Likely to Impact, (2) Possible Impact, (3) Not Likely to Impact
- Weight: 5%

Potential Cumulative Effects: Cumulative adverse impacts can occur when several projects are conducted in quick succession, or near one another. Known projects or ongoing nourishment efforts were reviewed to identify those cases where cumulative impacts are likely to occur.

- Scoring: (1) Likely to Occur, (2) Possible, (3) Not Likely to Occur
- Weight: 5%

Scoring for each of the candidate receiver sites is shown in Table 6-3. The scores are color-coded to indicate which are low (red), average (yellow), and high (green). In addition, the table is sorted based on the final score with the best SCOUP candidate listed first and the worst candidate last. Salient findings for each site (listed from best to worst) are provided below.

- **Dockweiler Beach** benefits from being a prior Marina del Rey beach nourishment receiver site with good construction access and staging areas for materials and equipment. In addition, sensitive habitat is sparse, reducing the likelihood for impacts. Several groins provide some measure of sand retention, and the beach feeds downcoast sites, such as Manhattan Beach and Hermosa Beach.
- **Zuma Beach** was identified as the most vulnerable site to coastal hazards and sea level rise in the *LACDBH Coastal Resiliency Study* (Table 6-2) due to the rate of erosion and high public use. The beach is located adjacent to PCH, providing easy access for trucks, and prior construction activities have demonstrated that equipment can safely work in the area. While Zuma is located within the Point Dume State Marine Conservation Area (SMCA), beach nourishment is permitted (California Code of Regulations, Title 14, Section 632) . Note, beach nourishment is not permitted in the Point Dume State Marine Reserve (SMR). Both are shown in Figure 6-1.
- **Redondo Beach**, specifically the region between Redondo Pier and Topaz Groin, was used as a receiver site during maintenance dredging events at Marina del Rey in 2000 and 2012, providing precedent for this site as part of SCOUP. The beach is a popular destination, and the local community supports proactive maintenance of the shoreline.
- **Will Rogers** is the least vulnerable site considered for SCOUP; however, construction feasibility is high and sensitive habitat is sparse in the area. The local community is expected to support beach nourishment at this location and impacts on surfing and rivers/creeks are expected to be below a level of significance.
- At **Las Tunas**, much of the back beach is armored and construction will be challenging. Nevertheless, the community is expected to support beach nourishment at this site and sensitive biological resources are not abundant.

- **Topanga Beach** is one of the least vulnerable sites considered for SCOUN and sensitive habitat is abundant in this area. While construction access is good, these challenges make Topanga less advantageous for inclusion in the SCOUN plan.
- Construction access is the primary limitation at **Dan Blocker Beach**. Based on discussions with LACDBH Operational Services Division Staff (Martinez, 2023), no good routes are available on or off the beach.
- Low public use and a lack of amenities at **Nicholas Canyon** resulted in a low vulnerability score. In addition, this site is challenged by difficult construction access and is a popular location for local surfers.
- Any beach management activities at **Malibu Surfrider** will be challenging due to the popularity of this site and its designation as a World Surfing Reserve and inclusion in the National Register of Historic Places (Stern, 2018). SCOUN activities will be highly scrutinized here.
- **Point Dume Beach** is located within the Point Dume State Marine Reserve (Figure 6-1) and beach nourishment activities are not permitted at this site (California Code of Regulations, Title 14, Section 632). As a result, it was not considered as a potential SCOUN receiver beach.



Figure 6-1. Pt. Dume State Marine Conservation Area & Pt. Dume State Marine Reserve

6.3 Receiver Site Selection

The top five sites, listed below, were selected for inclusion in Phase 2 of the LACDBH SCOUP plan development.

1. Dockweiler State Beach
2. Zuma Beach
3. Redondo Beach
4. Will Rogers State Beach
5. Las Tunas

As part of Phase 2, data necessary to support environmental review and regulatory permitting efforts will be identified. Where gaps in publicly available data are present, proposals to collect the necessary information will be prepared for review by the County. Once all necessary data have been obtained and analyzed, the environmental documents will be prepared and submitted. Finally, implementation guidelines will be developed to provide County Staff with the ability to evaluate potential SCOUP projects.

Legend: **Low Score**, **Average Score**, **High Score**

Table 6-3. Decision Matrix for Potential SCOUP Receiver Sites

Site	LACDBH Resiliency Study Vulnerability ³	Potential Benefits						Potential for Effects					Final Score ⁴
		Construction Feasibility	Local Support ⁵	Natural Sediment Delivery ⁶	Benefit Adjacent Beaches ⁷	Sand Retention	Historic Receiver Site	Proximity to Residences	Intertidal / Offshore Habitat & Biological Resources	Surfing	Rivers & Creeks	Cumulative	
Weight (%)	15	20	5	5	5	5	5	15	10	5	5	5	-
Scoring	3 = Most Vulnerable	1 = Challenging	1 = Likely to Oppose	1 = No natural source	1 = No Benefit	1 = No	1 = No	1 = Likely Disturbance	1 = Extensive Sensitive Habitat	1 = Likely to Impact	1 = Likely to Impact	1 = Likely to Occur	1 = High Priority
	1 = Least Vulnerable	3 = Highly Feasible	3 = Likely to Support	3 = Major natural source	3 = Significant Benefit	3 = Yes	3 = Yes	3 = Unlikely Disturbance	3 = Sparse Sensitive Habitat	3 = Not Likely to Impact	3 = Not Likely to Impact	3 = Not Likely to Occur	10 = Low Priority
Dockweiler	Vulnerable (2) 68.0/100 Not vulnerable, but significant recreational amenities and high use. Historical receiver site (Hyperion) Dune habitat on south end may be good receiver site.	Highly Feasible (3) Good access and staging area.	Support (3) Likely to support program	Minor (2) Ballona Creek (north end of reach) Not a major source of sediment. Creek is challenged by contaminants and Marina del Rey breakwater.	Significant (3) Feeder beach for Manhattan and Hermosa Beach.	Exists (3) Several groins	Yes (3) Material from Marina del Rey maintenance Dredging (1964-2017) ⁸	Unlikely (3) Unlikely to cause disturbance to local residences.	Sparse Sensitive Habitat (3) <u>MLPA/ASBS/Critical Habitat/HAPC</u> Western snowy plover critical habitat Green sea turtle critical habitat <u>Intertidal</u> California grunion <u>Subtidal</u> Kelp bed associated with Marina Del Rey breakwater Eelgrass in Marina Del Rey entrance channel <u>Other Sensitive Habitat</u> Commercial lobster area Dunes present in southern portion	Not Likely (3) Beach break, not likely to impact surfing.	Not Likely (3) Ballona Creek (north end of reach) has a stabilized entrance.	Possible (2) Potential for cumulative impacts with Marina del Rey bypassing	Rank = 1 0.92
Zuma	Most Vulnerable (3) 76.0/100 Scored high on vulnerability (erosion rate) & beach use (visitorship). Popular destination for visitors from inland San Fernando valley.	Highly Feasible (3) Demonstrated success (Beach Berm Construction, Broad Beach Project). Adjacent to PCH. Several staging areas (parking lots).	Support (3) Supports adding sand to the littoral system. Can be sensitive to truck hauling.	Minor (2) Trancas Creek (west end of reach) Zuma Canyon Creek (east end of reach)	Significant (3) Updrift end of the littoral cell. Seasonally benefits both Point Dume (east) and Broad Beach (west). Potential sand loss to Dume Submarine Canyon ⁹ .	Exists (3) The reach from Lechuza Pt. to Pt. Dume behaves similar to a pocket beach.	No (1)	Unlikely (3) Unlikely to cause disturbance to local residences.	Some Sensitive Habitat (2) <u>MLPA/ASBS/Critical Habitat/HAPC</u> Point Dume SMCA ¹⁰ Laguna Point to Latigo Point ASBS ¹¹ . Critical Habitat: Tidewater goby (at Zuma Canyon), Western snowy plover. <u>Intertidal</u> California grunion <u>Subtidal</u> Sand dollar beds Pismo clams <u>Other Sensitive Habitat</u> Kelp beds, surfgrass, rocky intertidal/ subtidal, Point Dume State Marine Reserve associated with Point Dume (downcoast)	Not Likely (3) Beach break. Nourishment not likely to impact surfing.	Possible (2) Nourishment may impact breaching of Trancas Creek (west end of reach) & Zuma Canyon Creek (east end of reach)	Possible (2) Potential for cumulative impacts if Broad Beach Restoration Project moves forward.	Rank = 2 0.88

³ Moffatt & Nichol, 2023a

⁴ Final score computed as the sum of the product of the individual score for each category and the weight, divided by the maximum possible score (300). Rank based on the final score.

⁵ Qualitative judgement based on prior experience at the site.

⁶ Based on the presence of streams and/or creeks that naturally deliver sediment to the coastal zone.

⁷ Includes both up and downcoast beaches.

⁸ Ryan, 2023

⁹ George et al. (2018); Griggs and Patch (2018); Everts et al. (2005)

¹⁰ State Marine Conservation Area

¹¹ Area of Specific Biological Significance

Legend: **Low Score**, **Average Score**, **High Score**

Table 6-3. Decision Matrix for Potential SCOUP Receiver Sites (continued)

Site	LACDBH Resiliency Study Vulnerability ³	Potential Benefits						Potential for Effects					Final Score ⁴
		Construction Feasibility	Local Support ⁵	Natural Sediment Delivery ⁶	Benefit Adjacent Beaches ⁷	Sand Retention	Historic Receiver Site	Proximity to Residences	Intertidal / Offshore Habitat & Biological Resources	Surfing	Rivers & Creeks	Cumulative	
Weight (%)	15	20	5	5	5	5	5	15	10	5	5	5	-
Scoring	3 = Most Vulnerable	1 = Challenging	1 = Likely to Oppose	1 = No natural source	1 = No Benefit	1 = No	1 = No	1 = Likely Disturbance	1 = Extensive Sensitive Habitat	1 = Likely to Impact	1 = Likely to Impact	1 = Likely to Occur	1 = High Priority
	1 = Least Vulnerable	3 = Highly Feasible	3 = Likely to Support	3 = Major natural source	3 = Significant Benefit	3 = Yes	3 = Yes	3 = Unlikely Disturbance	3 = Sparse Sensitive Habitat	3 = Not Likely to Impact	3 = Not Likely to Impact	3 = Not Likely to Occur	10 = Low Priority
Redondo Pier to Topaz Groin	Most Vulnerable (3) 74.3/100 Scored high on vulnerability (erosion rate) & amenities. Popular site for beach recreation.	Highly Feasible (3) Good access and staging area.	Support (3) Very popular beach. Community supports proactive maintenance.	None (1) No rivers or creeks nearby	No Benefit (1) Longshore transport in the region north of Topaz Groin is toward King Harbor and Redondo Submarine Canyon	Partial (2) Partial shelter provided by Topaz Groin. Sink at King Harbor.	Yes (3) Material from Marina del Rey maintenance Dredging placed between Redondo Pier and Topaz Groin (2000, 2012) ⁸	Possible (2) Possible that local residences will be impacted by truck traffic.	Sparse Sensitive Habitat (3) <u>MLPA/ASBS/Critical Habitat/HAPC</u> Green sea turtle critical habitat <u>Intertidal</u> California grunion <u>Subtidal</u> Some kelp in southern area <u>Other Sensitive Habitat</u> Kelp beds, surfgrass, rocky intertidal/ subtidal, resident broomtail grouper population, black abalone critical habitat associated with Palos Verdes (downcoast)	Not Likely (3) No surfing in area north of Topaz Groin.	Not Likely (3) No rivers or creeks nearby.	Possible (2) Possible cumulative effects with Redondo bypassing.	Rank = 3 0.85
Will Rogers East End	Least Vulnerable (1) 58.3/100 Low vulnerability. High resources & amenities, use.	Highly Feasible (3) Good accessibility and staging areas (parking lots) on east end.	Support (3) Community support expected to be high.	Minor (2) Santa Ynez Canyon (west end of reach) Temescal Canyon (middle of reach) Santa Monica Canyon (east end of reach)	Some (2) Could benefit Venice	Exists (3) Has several groins.	No (1)	Unlikely (3) Unlikely to cause disturbance to local residences.	Sparse Sensitive Habitat (3) <u>MLPA/ASBS/Critical Habitat/HAPC</u> Green sea turtle critical habitat Kelp Canopy HAPC <u>Intertidal</u> California grunion Surfgrass <u>Subtidal</u> Kelp beds <u>Other Sensitive Habitat</u> Western snowy plover critical habitat (downcoast)	Not Likely (3) Minor surf spots. Not likely to be impacted.	Not Likely (3) Several channelized creeks: Santa Ynez Canyon (west end of reach) Temescal Canyon (middle of reach) Santa Monica Canyon (east end of reach)	Not Likely (3) None	Rank = 4 0.83

Legend: **Low Score**, **Average Score**, **High Score**

Table 6-3. Decision Matrix for Potential SCOUP Receiver Sites (continued)

Site	LACDBH Resiliency Study Vulnerability ³	Potential Benefits						Potential for Effects					Final Score ⁴
		Construction Feasibility	Local Support ⁵	Natural Sediment Delivery ⁶	Benefit Adjacent Beaches ⁷	Sand Retention	Historic Receiver Site	Proximity to Residences	Intertidal / Offshore Habitat & Biological Resources	Surfing	Rivers & Creeks	Cumulative	
Weight (%)	15	20	5	5	5	5	5	15	10	5	5	5	-
Scoring	3 = Most Vulnerable	1 = Challenging	1 = Likely to Oppose	1 = No natural source	1 = No Benefit	1 = No	1 = No	1 = Likely Disturbance	1 = Extensive Sensitive Habitat	1 = Likely to Impact	1 = Likely to Impact	1 = Likely to Occur	1 = High Priority
	1 = Least Vulnerable	3 = Highly Feasible	3 = Likely to Support	3 = Major natural source	3 = Significant Benefit	3 = Yes	3 = Yes	3 = Unlikely Disturbance	3 = Sparse Sensitive Habitat	3 = Not Likely to Impact	3 = Not Likely to Impact	3 = Not Likely to Occur	10 = Low Priority
Las Tunas	Vulnerable (2) 66.0/100 High erosion rate and narrow beach. Limited resources & amenities. Relatively low use.	Challenging (1) Difficult truck access. Armored slopes.	Support (3) Community support expected to be high.	Minor (2) Pena Canyon (east end of reach)	Significant (3) Could benefit Topanga, Will Rogers, Venice.	Exists (3) Groin (unknown condition)	No (1)	Unlikely (3) Unlikely to cause disturbance to local residences.	Some Sensitive Habitat (2) <u>MLPA/ASBS/Critical Habitat/HAPC</u> Green sea turtle critical habitat Kelp Canopy HAPC <u>Intertidal</u> Surfgrass California grunion <u>Subtidal</u> Kelp beds <u>Other Sensitive Habitat</u> Tidewater goby critical habitat at Topanga Lagoon (downcoast)	Not Likely (3) No surfing	Not Likely (3) Pena Canyon (east end of reach) has channelized mouth.	Not Likely (3) None	Rank = 5 0.73
Topanga West End near Topanga Lagoon	Least Vulnerable (1) 61.1/100 Moderate vulnerability and resources & amenities. Relatively low beach use.	Highly Feasible (3) Good access (ramp east of Topanga Lagoon) and staging area (beach parking)	Unknown (2) Community support expected to be high. Local surfers likely to oppose.	Major (3) Topanga Lagoon (west end of reach)	Some (2) Could benefit Will Rogers, Venice.	Partial (2) Revetment at Mastro's acts as partial groin.	No (1)	Unlikely (3) Unlikely to cause disturbance to local residences.	Extensive Sensitive Habitat (1) <u>MLPA/ASBS/Critical Habitat/HAPC</u> Tidewater goby critical habitat Green sea turtle critical habitat Steelhead critical habitat Kelp Canopy HAPC <u>Intertidal</u> California grunion Surfgrass <u>Subtidal</u> Kelp beds <u>Other Sensitive Habitat</u> Topanga lagoon area sea bird nesting/roosting	Likely (1) Popular surf breaks.	Possible (2) Possible impacts to breaching of Topanga Canyon (west end of reach)	Not Likely (3) None	Rank = 6 0.70

Legend: **Low Score**, **Average Score**, **High Score**

Table 6-3. Decision Matrix for Potential SCOUP Receiver Sites (continued)

Site	LACDBH Resiliency Study Vulnerability ³	Potential Benefits						Potential for Effects					Final Score ⁴
		Construction Feasibility	Local Support ⁵	Natural Sediment Delivery ⁶	Benefit Adjacent Beaches ⁷	Sand Retention	Historic Receiver Site	Proximity to Residences	Intertidal / Offshore Habitat & Biological Resources	Surfing	Rivers & Creeks	Cumulative	
Weight (%)	15	20	5	5	5	5	5	15	10	5	5	5	-
Scoring	3 = Most Vulnerable	1 = Challenging	1 = Likely to Oppose	1 = No natural source	1 = No Benefit	1 = No	1 = No	1 = Likely Disturbance	1 = Extensive Sensitive Habitat	1 = Likely to Impact	1 = Likely to Impact	1 = Likely to Occur	1 = High Priority
	1 = Least Vulnerable	3 = Highly Feasible	3 = Likely to Support	3 = Major natural source	3 = Significant Benefit	3 = Yes	3 = Yes	3 = Unlikely Disturbance	3 = Sparse Sensitive Habitat	3 = Not Likely to Impact	3 = Not Likely to Impact	3 = Not Likely to Occur	10 = Low Priority
Dan Blocker East End	Vulnerable (2) 67.4/100 High erosion rate and narrow beach. Limited resources & amenities. Relatively low use.	Challenging (1) No good avenue in/out ¹² .	Support (3) Likely to support program.	Minor (2) Solstice Canyon (west end of reach) Corral Canyon (middle of reach)	Some (2) Several downcoast beaches may benefit	Partial (2) Some armoring at LG tower	No (1)	Likely (1) Disturbance likely to local residences on east end.	Some Sensitive Habitat (2) <i>MLPA/ASBS/Critical Habitat/HAPC</i> Laguna Point to Latigo Point ASBS Green sea turtle critical habitat Kelp Canopy HAPC <i>Intertidal</i> Surfgrass California grunion <i>Subtidal</i> Kelp beds Eelgrass <i>Other Sensitive Habitat</i> Extensive kelp beds, surfgrass, rocky intertidal/ subtidal downcoast	Not Likely (3) Some surf breaks (Latigo), but not likely to be impacted. Relatively low beach use	Not Likely (3) Only watercourses are channelized: Solstice Canyon (west end of reach) Corral Canyon (middle of reach)	Not Likely (3) None	Rank = 7 0.60
Nicholas Canyon	Least Vulnerable (1) 60.1/100 Limited resources & amenities and lowest beach use in LAC. May be a strategically important site since on west end of LAC.	Challenging (1) No service road to beach. ¹²	Unknown (2) Surfers may oppose nourishment. Downcoast communities may support nourishment.	None (1) Several small drainages. Arroyo Sequit Creek (west of beach)	Significant (3) Western-most site in LAC.	Partial (2) Revetment at point acts as partial groin.	No (1)	Unlikely (3) Unlikely to cause disturbance to local residences.	Some Sensitive Habitat (2) <i>MLPA/ASBS/Critical Habitat/HAPC</i> Laguna Point to Latigo Point ASBS Kelp Canopy HAPC <i>Intertidal</i> California grunion Surfgrass <i>Subtidal</i> Kelp beds Eelgrass <i>Other Sensitive Habitat</i> Cultural resources along bluffs Tidewater goby critical habitat (upcoast at Arroyo Sequit Creek) Steelhead critical habitat (upcoast at Arroyo Sequit Creek) kelp beds, surfgrass, rocky intertidal/ subtidal habitat extensive downcoast	Likely (1) Popular surf spot (Zeros).	Not Likely (3) Several small drainages. Not likely to be impacted. Arroyo Sequit Creek (west of beach) is upcoast and not likely to be impacted.	Not Likely (3) None	Rank = 8 0.60

¹² Martinez, E., 2023, personal communication, LA County Department of Beaches and Harbors Operational Services Division.

Legend: **Low Score**, **Average Score**, **High Score**

Table 6-3. Decision Matrix for Potential SCOUP Receiver Sites (continued)

Site	LACDBH Resiliency Study Vulnerability ³	Potential Benefits						Potential for Effects					Final Score ⁴
		Construction Feasibility	Local Support ⁵	Natural Sediment Delivery ⁶	Benefit Adjacent Beaches ⁷	Sand Retention	Historic Receiver Site	Proximity to Residences	Intertidal / Offshore Habitat & Biological Resources	Surfing	Rivers & Creeks	Cumulative	
Weight (%)	15	20	5	5	5	5	5	15	10	5	5	5	-
Scoring	3 = Most Vulnerable	1 = Challenging	1 = Likely to Oppose	1 = No natural source	1 = No Benefit	1 = No	1 = No	1 = Likely Disturbance	1 = Extensive Sensitive Habitat	1 = Likely to Impact	1 = Likely to Impact	1 = Likely to Occur	1 = High Priority
	1 = Least Vulnerable	3 = Highly Feasible	3 = Likely to Support	3 = Major natural source	3 = Significant Benefit	3 = Yes	3 = Yes	3 = Unlikely Disturbance	3 = Sparse Sensitive Habitat	3 = Not Likely to Impact	3 = Not Likely to Impact	3 = Not Likely to Occur	10 = Low Priority
Malibu Surfrider Adamson Wall to Pier	Most Vulnerable (3) 71.9/100 Very narrow beach (vulnerable). Moderate/low visitorship or use by disadvantaged communities.	Challenging (1) No good avenue in/out without significant disruption to beach users. Will likely require multiple handling of material.	Oppose (1) Very controversial site for beach mgmt. Almost any approach will be criticized.	Major (3) Malibu Lagoon (west end of reach)	Significant (3) Several narrow reaches downcoast.	None (1) No retention structures	No (1)	Possible (2) Possible that local residences will be impacted by truck traffic.	Extensive Sensitive Habitat (1) <i>MLPA/ASBS/Critical Habitat/HAPC</i> Green sea turtle critical habitat Tidewater goby critical habitat Western snowy plover critical habitat Steelhead critical habitat Kelp Canopy HAPC <i>Intertidal</i> California grunion Surfgrass <i>Subtidal</i> Kelp beds <i>Other Sensitive Habitat</i> Eelgrass upcoast off Amarillo Beach, Malibu lagoon area sea bird nesting/roosting	Likely (1) Designated as World Surfing Reserve. While nourishment is not likely to impact surfing, any activities will be perceived as impacting surfing.	Possible (2) May impact Malibu Lagoon (west end of reach)	Possible (2) Possible cumulative effects with State Parks Project at Adamson House.	Rank = 9 0.58
Point Dume	Most Vulnerable (3) 70.1/100 Vulnerable on west end. Strong candidate given recent problems and pending CDP requiring pursuit of nature-based solutions.	Feasible (2) One lane road requires careful coordination of trucks. Staging area at east end of beach.	Support (3) Supports adding sand to the littoral system. Can be sensitive to truck hauling.	Minor (2) Zuma Canyon Creek (west end of reach)	Significant (3) Updrift end of the littoral cell. Seasonally benefits both Point Dume (east) and Broad Beach (west). Potential sand loss to Dume Submarine Canyon.	Exists (3) The reach from Lechuza Pt. to Pt. Dume behaves similar to a pocket beach. Potential Sand Loss to Dume Submarine Canyon.	No (1)	Possible (2) Possible that local residences will be impacted by truck traffic.	Extensive Sensitive Habitat (1) <i>MLPA/ASBS/Critical Habitat/HAPC</i> Point Dume SMR ¹³ Laguna Point to Latigo Point ASBS Western snowy plover critical habitat Kelp Canopy HAPC <i>Intertidal</i> California grunion <i>Subtidal</i> Kelp beds <i>Other Sensitive Habitat</i> Tidewater goby critical habitat (Zuma Canyon) Rocky intertidal/ subtidal kelp beds and surfgrass associated with Point Dume Eelgrass downcoast (Dan Blocker) Green sea turtle critical habitat downcoast	Not Likely (3) Portion offshore of beach not frequently surfed, but could be impacted.	Possible (2) May impact Zuma Canyon Creek (west end of reach).	Possible (2) Potential for cumulative impacts if Broad Beach Restoration Project moves forward.	Rank = 10 0.73 ¹⁴

¹³ State Marine Reserve

¹⁴ Nourishment activities are prohibited at Point Dume due to State Marine Reserve (SMR) designation.

7 Potential SCOUP Sand Sources

This section includes a high-level overview and initial assessment of potential SCOUP sand sources for the five candidate receiver sites identified in Section 6.3. Sources within 20 miles of the receiver sites were considered most viable (Moffatt & Nichol, 2006) in order to minimize transportation costs and reduce the overall environmental effects associated with delivering the material to the beach. More distant sources have been included to expand potential SCOUP opportunities for LACDBH in light of the recent directive from the Los Angeles County Board of Supervisors to place greater emphasis on beneficial reuse of sediment within the region (County of Los Angeles, 2023).

Sources considered included dam removal, reservoirs and debris basins managed by the County, local watercourses (rivers, creeks, and streams), lagoons, harbor maintenance dredging, transportation projects, upland development projects, and landslides. Each type is described in the subsections that follow. The locations of known sand sources are shown in Figure 7-1 along with the five candidate receiver beaches identified in Section 6.3. Potential haul routes are designated for those sources where the material would be transported by truck.

7.1 Dam Removal in Malibu Creek Watershed

LA County's largest inland source of beach quality sediment proximate to the coast is the Rindge Dam reservoir in Malibu (Noble Consultants and Larry Paul & Associates, 2017). The dam was constructed in the 1920s along Malibu Creek for water supply and flood control purposes. The dam effectively trapped sediments that would have travelled to the coast naturally, resulting in rapid filling of the reservoir with soil and debris. By the 1950s, the reservoir was almost filled with sediment and no longer functional for water storage or flood protection.

The *Malibu Creek Ecosystem Restoration Study* (USACE and CDPR, 2020) is investigating removal of the dam and restoration of natural sediment delivery to the shoreline. As part of the project, approximately 276,000 cy of beach quality sediment has been identified as suitable for beach nourishment. Methods to transport the material to the beach include (1) truck directly to the beach; (2) truck to a barge in the Port of Long Beach and barge to the beach; (3) slurry line from dam to shoreline along Malibu Creek; and (4) sluice downstream for future storms to deliver to the shoreline.

Beach-quality material available following removal of the dam is presently designated for either onshore or nearshore placement just east of Malibu Pier, which is not one of the designated receiver sites for the SCOUP program. However, there is a potential need for the project to identify alternative receiver sites. Hence, it is worthwhile to track this unique and important opportunity closely.

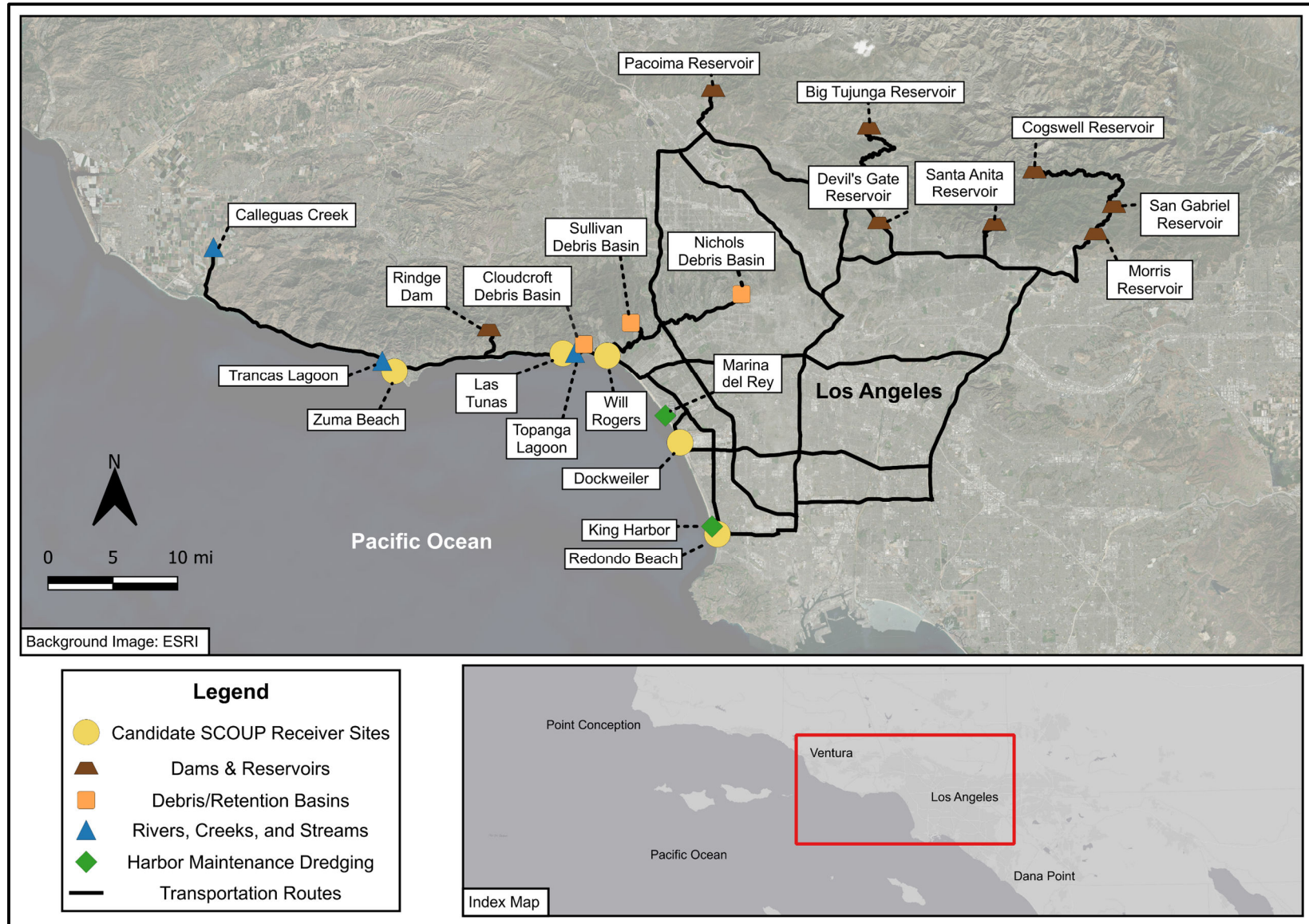


Figure 7-1. Location Map of Potential Sand Sources in Relation to Receiver Sites

7.2 County-Owned Reservoirs and Debris Basins

Reservoirs and debris or retention basins trap material that may otherwise travel downstream and cause flooding. Infilling is sporadic and dependent on several factors, including the rate and timing of precipitation. Material that is impounded within these features must be removed during maintenance events and typically is placed in a landfill, used as landfill cover, or repurposed as construction fill. If beach quality sediment within the reservoir can be identified and segregated, it can be used as beach nourishment.

The *Coastal Regional Sediment Master Plan* for Los Angeles County (Noble Consultants and Larry Paul & Associates, 2017) included an assessment of potential sources of inland sand for use as beach nourishment. Los Angeles County operates and maintains over 100 debris basins and dams within the region's watersheds. However, the distance between some of these facilities and the coast, material processing challenges, and transportation costs were identified in the study as significant impediments to their use as beach nourishment.

The Los Angeles County Flood Control District (LACFCD) prepared a *Sediment Management Strategic Plan* (County of Los Angeles, 2013) to identify feasible sediment management alternatives for the 20-year period from 2012 to 2032. The following statement is included in the *Strategic Plan* summary:

...the use of the sediment for replenishing the beaches in the County of Los Angeles would involve removing the sediment from the reservoirs and debris basins, transporting it to a processing site, processing the sediment for sand and managing the unusable byproducts, transporting the sand to the beaches, and placing the sand there. In order to perform all these tasks, the Flood Control District would need to find cost-sharing and project management partnerships. The Flood Control District understands that as long as better sources of sand are available to those agencies, there may be no interest for those agencies to incur additional expenses to extract sand from the reservoir and debris basin deposits. However, the Flood Control District will continue to analyze this alternative further.

The reservoirs and most of the debris basins maintained by the LACFCD are located about 30 to 80 miles from the coast. In addition, the Strategic Plan notes that less than 25% of the impounded sediment deposits are expected to meet the stringent compatibility requirements for beach nourishment. The study further states that between the 1940s and 2010, a total of approximately 330,000 cy of sediments were removed from three debris basins (Cloudcroft, Sullivan, and Nichols), which are closest to the beaches in the Santa Monica region.

It is important to note that since publication of the Strategic Plan in 2013, many beaches in Los Angeles County have continued to erode, and future sea level rise further increases their

vulnerability. To better implement opportunities for the beneficial reuse of sediment for beach nourishment, the Los Angeles County Board of Supervisors introduced the Board Motion *Protecting Los Angeles County’s Beaches from Coastal Erosion through the Beneficial Reuse of Sediment and by Deploying Living Shorelines* on November 7, 2023 (See Appendix C).

This directive should greatly facilitate the identification, evaluation, and implementation of potential opportunistic sand sources from reservoirs, debris basins, and harbor maintenance dredging. The following provides a high-level initial assessment of some of the key parameters that will need to be considered to determine the potential feasibility of using these sediments for beach nourishment.

Potentially viable beach sand sources from upland reservoirs and debris basins managed by the LACFCD are listed in Table 7-1 and Table 7-2, respectively, and their locations are illustrated in Figure 7-1. The tables also include the approximate minimum trucking distance between the sand source and each of the five candidate SCOUP receiver sites.

Table 7-1. Distance between Reservoirs and Candidate SCOUP Receiver Sites

SCOUP Receiver Site	Minimum Distance (mi)						
	Pacoima	Big Tujunga	Devil's Gate	Cogswell	San Gabriel	Morris	Santa Anita
Dockweiler	32	45	34	60	48	45	42
Zuma	48	61	54	80	67	65	59
Redondo	42	52	37	63	50	47	45
Will Rogers	32	45	34	62	51	49	41
Las Tunas	36	49	37	66	54	52	45

Table 7-2. Distance between Debris Basins and Candidate SCOUP Receiver Sites

SCOUP Receiver Site	Minimum Distance (mi)	
	Cloudcroft	Sullivan
Dockweiler	13	12
Zuma	17	24
Redondo	22	22
Will Rogers	1	9
Las Tunas	2	10

Sediment management alternatives employed by the LACFCD relevant to providing potential beach fill sand source material include:

- **Staging and storage areas:** Depending on the mode of transportation and sediment destination, transfer of sediment from one transportation mode to another requires a staging area. These areas can be temporary or more permanent sediment placement sites (SPSs).
- **Transportation alternatives:** The primary transportation mode to deliver sediments from upland sources to receiver beach sites is by truck. Trucking is suitable for generally dry material and has been used extensively by the LACFCD to transport sediment from reservoirs and debris basins. Using trucks to transport sediment from reservoirs and debris basins involves the use of single-dump and double-dump trucks. Low emission trucks are advantageous to reduce air quality impacts, but availability and cost are constraints.

In discussions with LACFCD staff, recent wildfire activity has significantly increased the amount of sediment delivered from the watershed into reservoirs and debris basins, requiring greater sediment removal to maintain stormwater storage capacity. As of November 2023, the following were cited as providing potentially viable beach fill material:

- Devils Gate Reservoir:** Potential source opportunity. Average annual sedimentation rate between 30,000 and 100,000 cy.
- Big Tujunga Reservoir:** SPS located nearby. Next sediment cleanout cycle starts 2025/2026.
- Pacoima Reservoir:** Environmental Impact Report (EIR) will be published for the planned 2026 cleanout soon.
- Santa Anita Reservoir:** Good sandy material available.

The ability to use the more distant LACFCD reservoirs will require careful consideration of costs and environmental impacts. While the cost of sediment removal and staging is borne by LACFCD, the incremental cost to process the beach quality sand fraction and transport this material to the SCOUP receiver sites will be significant:

- The cost to screen out the beach-compatible sand from upland source stockpile or SPS is estimated to be on the order of \$3/cy to \$10/cy.
- The cost to transport sediment from the source to the receiver site is estimated to be \$1/cy/mi based on an average 4% annual increase from the \$0.65/cy/mi provided in the

Sediment Master Plan (County of Los Angeles, 2013). While trucking costs have been volatile in recent years, this value was confirmed as a suitable planning estimate based on recent discussions with a long-time construction contractor in the region. As shown in Table 7-1, the distance between the reservoirs and receiving beaches ranges from 32 to 80 miles. This translates into a transportation cost on the order of \$32/cy to \$80/cy. The debris basins are much closer, ranging from 1 to 24 miles (Table 7-2), or \$1/cy to \$24/cy.

- The cost to place sand at the receiver site typically ranges from \$5/cy to \$10/cy.

7.3 Rivers, Creeks, and Streams

Another potential source of sandy material for beach nourishment comes from rivers, creeks and streams that flow unimpeded to the coast. Sediment supply along many California rivers has slowed since construction of dams upstream. Some rivers are periodically excavated as flood control improvement or maintenance measures. Sediments produced by this excavation could be placed on the beach to help offset the volume of sediment that is trapped upstream behind dams and other flood control devices.

Calleguas Creek drains a watershed area in Ventura County of approximately 340 square miles, flowing into Mugu Lagoon before entering the Pacific Ocean¹⁵. It has been identified as having the third highest sediment yield of all rivers in California, with an estimated 100,000 cy of sand deposited in the creek channel on an annual basis. It is periodically cleared of sediment for flood control purposes, and the sediment has been identified in recent investigations as a potential source of beach nourishment material. Beneficial reuse of sand dredged from Calleguas Creek for beach widening and dune building is being considered as part of the *Coastal Adaptation Vision for Naval Base Ventura County Point Mugu* (ESA, 2020).

The potential Calleguas Creek borrow site is approximately 15 miles from Zuma Beach, the western-most and 2nd highest ranked receiver beach. Findings of a Sampling and Analysis Plan Report (SAPR) for this potential source conducted for another potential beach nourishment project indicated that there was approximately 200,000 cy of coarse sand in a stockpile adjacent to Calleguas Creek (U.S. Army Corps of Engineers, 2016a). The mean grain size was 0.78 mm, which may be too coarse to be considered as a sole source of fill material. The presence of *Arundo* and the potential of transporting roots and plant material to the beach are also concerns. The Calleguas Creek watershed is known as a source of contaminants, including pesticides, but chemical testing of the stockpiled material indicated chemical suitability for beach placement.

¹⁵ <https://www.vcpublishworks.org/wp/calleguas-creek/>

7.4 Lagoons

7.4.1 Trancas Lagoon Restoration

Trancas Creek and Lagoon are located at the western end of Zuma Beach. Trancas Creek has been identified as a priority stream for federally endangered steelhead trout and the Trancas Lagoon Restoration Project, led by the Resource Conservation District of the Santa Monica Mountains (RCDSMM), is seeking to improve fish passage and enhance the lagoon. Review of the *Trancas Lagoon Restoration Feasibility Study* (RCDSMM, 2015) indicates sediment excavation volumes ranging from 5,000 cy to almost 40,000 cy as part of lagoon restoration and additional excavation volumes may be available.

7.4.2 Topanga Lagoon Restoration

Topanga Lagoon is located at the mouth of Topanga Creek with a watershed in the Santa Monica Mountains. The Topanga Lagoon Restoration Project represents an example of a potential beneficial use sand source for beach nourishment. The project has been under investigation for nearly 20 years, and project stakeholders include California State Parks, the RCDSMM, Caltrans, and LACDBH. The project seeks to restore ecological value by expanding Topanga Lagoon from 1 to 7-10 acres and reconstructing the existing PCH bridge to accommodate the wider lagoon. The project benefits include reducing coastal storm damage and providing greater adaptive capacity to accommodate sea level rise. The project includes excavation of approximately 256,000 cy of existing roadway fill that has been designated for nearshore placement at Topanga Beach (Moffatt & Nichol, 2023b).

If sites other than nearshore placement at Topanga Beach warrant consideration, the Las Tunas receiver site represents a potentially ideal opportunity for beneficial reuse of at least a portion of this sediment. Las Tunas Beach is located under a mile updrift (to the west) of Topanga Beach. Hence, sand placed at Las Tunas would be delivered to Topanga Beach by more natural littoral processes than nearshore placement, potentially alleviating concerns related to negative impacts on surfing and/or nearshore biological resources.

7.5 Harbor Maintenance Dredging

The Los Angeles County Board of Supervisors November 2023 Motion also cites harbor maintenance dredging as a potential source of sand for beneficial reuse as beach fill material. Small craft harbors on the open California Coast generally create sand traps if located within a sediment transport pathway. These harbors require maintenance dredging at varying frequency depending on location and other factors. Small craft harbors within the Santa Monica Bay region include Marina del Rey Harbor and Redondo Beach – King Harbor.

At Marina del Rey, sediment accumulates in both the north and south ocean entrance channels. The source of sediment trapped in the north entrance channel is littoral transport from the northwest and is comprised of beach sand from within the littoral system. Conversely, the source of sediment trapped in the south entrance channel is Ballona Creek. Sediments discharged at the mouth of Ballona Creek are generally too fine for beach nourishment and contain contaminants.

Since 1969, the average shoaling rate at the north entrance to the harbor is approximately 45,000 cy/yr based on dredge volume data provided by USACE. The material is predominantly dredged and placed downdrift on Dockweiler Beach. Material is occasionally dredged and placed updrift, or “back-passed” to Venice Beach, or placed further downdrift at Redondo Beach to address local erosion issues. The most recent (2012) maintenance dredging placement locations and volumes are as follows (U.S. Army Corps of Engineers, 2016b):

- Dockweiler State Beach (Nearshore): 150,000 cy
- Redondo Beach (Nearshore and Beach): 157,000 cy
- Port of Long Beach Middle Harbor Slip 1: 471,000 cy

The next maintenance dredging cycle at Marina del Rey is scheduled for December 2023 through May 2024. The estimated dredge volume is 400,000 to 500,000 cy and is slated to be placed in the nearshore sediment placement area at Dockweiler State Beach (Figure 7-2). Recent discussions with USACE personnel (Ryan, 2023) indicate that the total volume of accumulated sediment in the MDR entrance channel is approximately 600,000 cy and they are pursuing additional funds for its full removal.

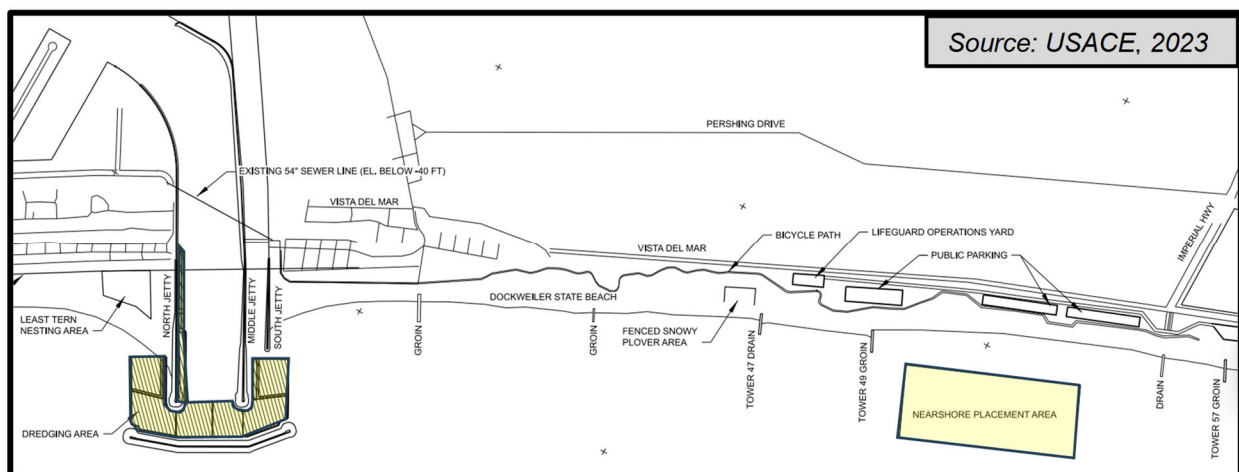


Figure 7-2. MDR Dredging Area and Dockweiler Nearshore Placement Area

The current beneficial reuse of beach quality sediments dredged from Marina del Rey helps to maintain the beaches at Venice, Dockweiler and Redondo Beach; the latter two identified as candidate receiver sites in this SCOUP study. LACDBH should strongly consider partnering with the USACE to expand the beneficial reuse of these sediments at beach sites farther to the west, including the Zuma, Las Tunas, and Will Rogers receiver sites.

Use of the Marina del Rey maintenance dredging for beach nourishment has already been demonstrated for a distant receiver beach at Redondo Beach. At this site, sand dredged from the MDR entrance channel is placed in a temporary nearshore placement area (Figure 7-3) and pumped onshore via hopper dredge at a future date. This same approach could be applied at receiver sites further west, such as Las Tunas and/or Will Rogers. Potential issues with the MPA downdrift of Zuma may preclude this site.

A strong supporting argument is that the sand is kept in the same littoral system, and beneficially relocated updrift, hence recycling this highly valuable commodity at moderate cost. With the expanded application of ocean-going hopper dredges on the west coast for recently authorized multi-year beach fill projects, the incremental cost to pump the sand stored in the temporary nearshore placement areas should be low compared to other sand sources.

This opportunity also could provide an important benefit to the USACE. Frequently, the funds appropriated for harbor maintenance dredging are insufficient to cover the full dredge volume needed to restore full design depths. In partnership with the USACE, LACDBH could continue pursuing full funding of future dredging, provided it is disposed in one of the designated temporary nearshore placement sites for future beach nourishment.

7.6 Transportation Project Construction and/or Maintenance

Major transportation projects such as roadways and bridges may generate surplus sediment from excavation activities. Excavating transportation corridors through coastal terrain composed of sandy sediment can result in suitable opportunistic sand that could be considered for beach placement.

One example of this type of opportunistic sand source is the recent replacement of the Trancas Creek Bridge by Caltrans in 2021-2022. The bridge is on PCH where it crosses Trancas Creek just north of Zuma Beach. The construction project resulted in a surplus sediment volume of approximately 20,000 cy, of which an estimated 8,000 cy was suitable for beach nourishment. Other examples include the Interstate-5 widening project in San Diego, which generated beach compatible export material that was placed on the beach in Encinitas.

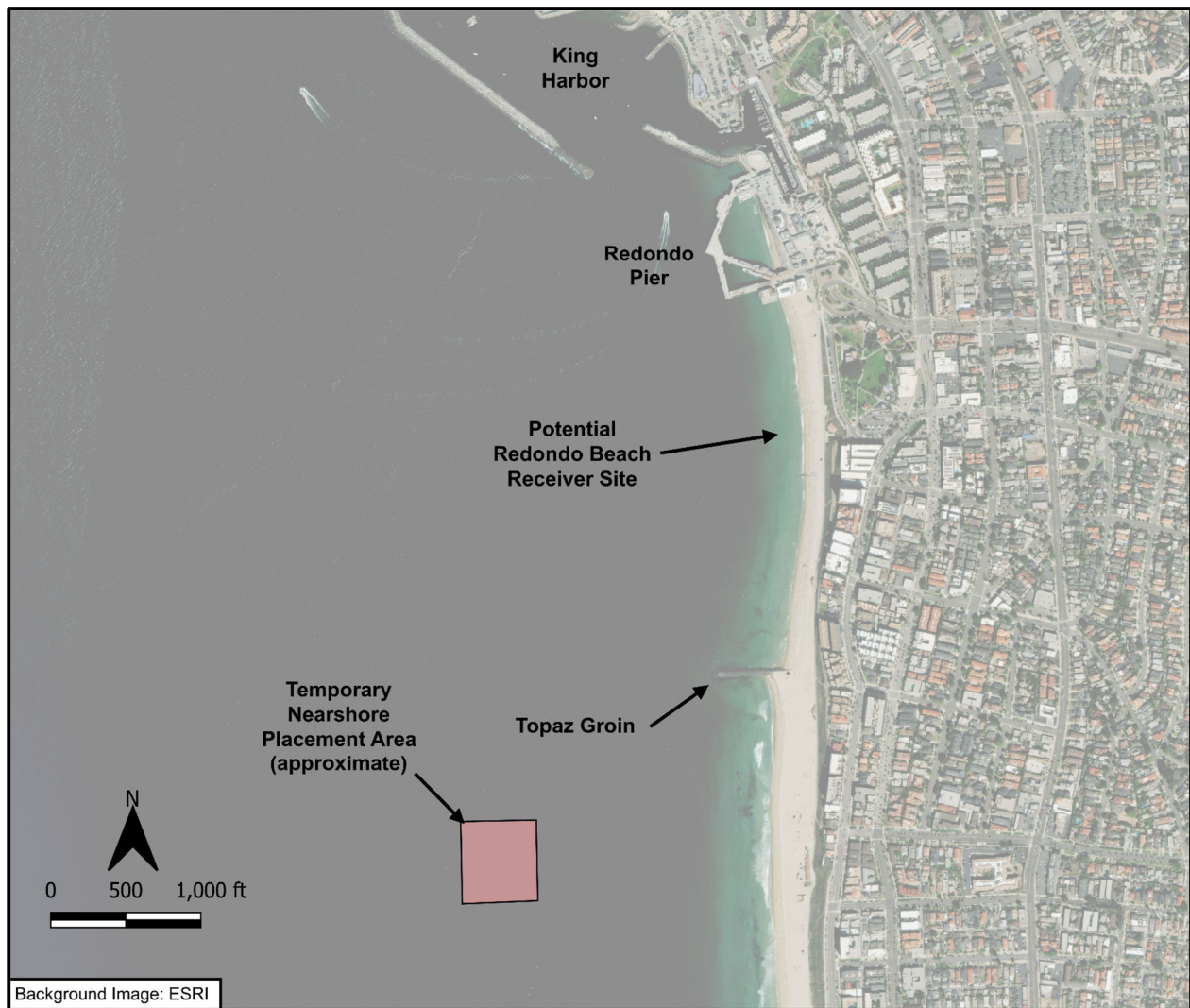


Figure 7-3. Temporary Nearshore Placement Area at Redondo Beach

7.7 Local Upland Development/Redevelopment or Maintenance Projects

An example of a potential sand source in this category occurred in June 2023 when LACDBH was contacted by a company that had extra sand that was used at the Santa Monica Bay Club. The company was willing to donate a small amount of sand (around 500 cy); however, in the absence of a streamlined sampling, testing, and permitting protocol, the opportunity was not pursued further.

Other examples of construction projects generating beach compatible export material have occurred in Solana Beach and Encinitas and one is currently planned in Oceanside.

7.8 Landslides

Landslide deposits are another potential source of sediment for SCOUP. Landslides generally occur during the wet winter season along road or railroad cuts, and other over-steepened areas. When landslides occur near roadways and railroad tracks, Caltrans is responsible for removing the material and disposing of it properly. After the 2018 landslide in Santa Barbara and Montecito, the material was removed from the upland area and placed on the adjacent beaches as beach nourishment.

7.9 Compiling Sand Source Data

The search and inventory of potential sand sources involves researching available data and categorizing it in a way that can be used to prioritize their use as beach fill. Typically, the research involves efforts to gather information from local agency staff and to make them, and permit applicants, aware of the beach sand placement program opportunity developed by LACDBH. The type of information to be requested includes location, volume, material characteristics, timing, ownership, and point of contact.

Table 7-3 provides a template planning-level matrix for potential SCOUP sand sources. LACDBH should consider incorporating potential sources into a GIS database that can be used to best manage sediment regionally.

Table 7-3. Template for Potential SCOUP Sand Source Matrix

Type	Name	Distance From Receiver Beach (miles)					Quantity (cy)	Sand Fraction (%) and D ₅₀ (mm)	Timing	Ownership	Notes
		Dockweiler	Zuma	Redondo	Will Rogers	Las Tunas					
Dams and Reservoirs	Rindge Dam	31	11	36	13	9					
	Pacoima Reservoir	32	48	42	32	36					
	Big Tujunga Reservoir	45	61	52	45	49					
	Devil's Gate Reservoir	34	54	37	34	37					
	Cogswell Reservoir	60	80	63	62	66					
	San Gabriel Reservoir	48	67	50	51	54					
	Morris Reservoir	45	65	47	49	52					
	Santa Anita Reservoir	42	59	45	41	45					
Debris and Retention Basins	Cloudcroft Debris Basin	13	17	22	1	2				LA County	
	Sullivan Debris Basin	12	24	22	9	10				LA County	
	Nichols Debris Basin	13	33	20	18	19				LA County	
Rivers, Creeks, and Streams	Calleguas Creek	51	24	61	39	37					
Lagoons	Trancas Lagoon	29	1	37	19	15					
	Topanga Lagoon	14	15	23	2	1					
Harbor Maintenance Dredging	Marina del Rey	2	23	10	7	10				USACE	
	King Harbor	7	28	1	15	17				City of Redondo Beach	
Transportation Construction / Maintenance Projects¹⁶	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Upland Development/ Redevelopment or Maintenance¹⁷	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-
Landslides¹⁸	-	-	-	-	-	-	-	-	-	-	-

Template only – Not intended to be complete

¹⁶ No known transportation projects

¹⁷ No known development, redevelopment, or maintenance projects

¹⁸ No known landslides

8 Next Steps

This Phase 1 report outlines the “Project Description” and framework for SCoup implementation. Five candidate SCoup “receiver” beaches have been selected as the best LACDBH-managed sites for beach nourishment. A broad range of potential sand sources that can be used for opportunistic beach nourishment efforts also have been identified.

As part of Phase 2 of the project, existing physical and environmental data at each candidate receiver site will be reviewed to determine what gaps exist. If the County chooses to proceed, the missing data will be obtained and used to develop design parameters for the SCoup receiver site (e.g., footprint, receiver beach grain size envelope, design cross section). Finally, the environmental documents will be prepared, permit applications submitted, and implementation guidelines developed to assist County staff in evaluating potential SCoup projects.

As part of Phase 3, the potential sand sources described in this report (as well as other opportunities) will be monitored to determine if and when the material will become available and sources meeting the initial screening criteria will be pursued.

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Appendix A: Example SAP and SAPR

A representative Sampling and Analysis Plan and a Sampling and Analysis Plan Report are provided below. The SAP and SAPR were developed for the Solana 101 Mixed-Use Project in Solana Beach, CA.



Revised Testing Sampling and Analysis Plan

Solana 101 Mixed-Use Project
329 and 343 South Highway 101 and 112-114, 120, and 128 Dahlia Drive
Solana Beach, California

AEC Project No. 19-228SD
July 3, 2019

Prepared For:

Zephyr Partners
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Presented To:

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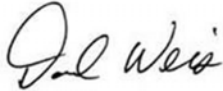
Revised Testing Sampling and Analysis Plan

Solana 101 Mixed-Use Project 329 and 343 South Highway 101 and 112-114, 120, and 128 Dahlia Drive Solana Beach, California

On behalf of Zephyr Partners, Advantage Environmental Consultants, LLC has prepared a Revised Testing Sampling and Analysis Plan (SAP) for the above-referenced property. This SAP is being submitted to the United States Army Corps of Engineers and United States Environmental Protection Agency (Region 9) for review and approval and was completed in accordance with the standards of care exercised by environmental and geoscience professionals in the industry.

PROJECT MANAGER CERTIFICATION

I certify that the information contained in or included with this submittal is accurate and complete. This submittal and all attachments were prepared at my direction and in accordance with protocols designed to assure that qualified personnel gathered and evaluated the information submitted in accordance with the standards of care exercised by environmental and geoscience professionals in the industry.



Daniel Weis, R.E.H.S.
Branch Manager

WORK PROGRAM CERTIFICATION

This Work Plan presents the technical approach AEC will take to investigate soil conditions at the above referenced subject property. The proposed SAP and field procedures to implement the SAP are in accordance with the standards of care exercised by environmental and geoscience professionals in the industry.



Eric Cathcart, MS, PG
California Professional Geologist #7548
Senior Geologist

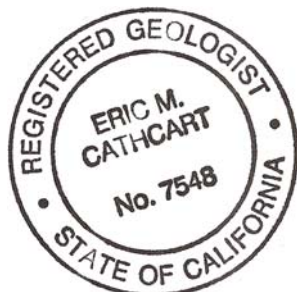


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FIGURES

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FIGURE 2	TOPOGRAPHIC MAP
FIGURE 3	SITE PLAN
FIGURE 4	FLETCHER COVE DISCHARGE LOCATION

ATTACHMENT

ATTACHMENT A	FORMER GASOLINE STATION INFORMATION
ATTACHMENT B	ANALYTE LISTS

1.0 INTRODUCTION

On behalf of Zephyr Partners, Advantage Environmental Consultants, LLC (AEC) has prepared this Revised Testing Sampling and Analysis Plan (SAP) pertaining to the Solana 101 Mixed-Use Project property in the City of Solana Beach, County of San Diego, California (Site). This SAP is being submitted to the United States Army Corps of Engineers (USACE) and United States Environmental Protection Agency (EPA) (Region 9) for review and approval and was prepared in general accordance with United States Army Corps of Engineers Los Angeles District and United States EPA Region 9 Draft Sampling and Analysis Plan Guidelines dated February 2015.

1.1 Site Location and Description

The 1.9-acre Site is located at 329 and 343 South Highway 101 and 112-114, 120, and 128 Dahlia Drive in the City of Solana Beach, California and is further identified by County of San Diego Assessor's Parcel Numbers 298-052-06, -07, -08, -13, and -14. The Site is currently developed with three one-story commercial buildings, a one-story residence, and multiple former mobile home parking pads and associated outbuildings and is situated generally north of Dahlia Drive, to the west of South Highway 101 and to the east by South Sierra Avenue. The Site is slated for new mixed-use development which will include demolition of existing improvements, mass grading operations and construction of new buildings over a two-level underground parking garage. Per the project grading plan, a reported 74,000 cubic yards of soil is planned to be exported from the Site during development activities. Maximum cuts are on the order of 25 feet below existing grades. There are no dredging related operations required during the planned Site development or potentially sensitive habitat related constraints associated with the planned development activities.

Current Site topography is gently sloping with an elevation ranging from approximately 60 feet above mean sea level to 70 feet above mean sea level. Site drainage is in a westerly direction. The latitude and longitude (decimal coordinates) of the approximate geographic center of the Site is (32.987702, -117.271442). The general location of the Site is depicted on the Vicinity Maps included as Figures 1a through 1c. A reproduction of a USGS topographic map of the Site is included as Figure 2. An aerial photograph-based Site Plan is included as Figure 3.

1.2 Site History

The existing commercial and residential Site buildings were constructed in the early 1950s. The southeast corner of the Site formerly operated as a gasoline station in the 1960s and 1970s. Prior to the use of the Site for commercial and residential purposes, the Site was vacant land or used for agricultural purposes. The Site is connected to the City maintained sanitary sewer system, including areas of the former mobile home pads. Adjacent properties have also been historically used for agricultural, commercial and residential purposes.

1.3 Previous Site Assessment Work and Regulatory Status

Two prior Phase I Environmental Site Assessments (ESAs) and a Phase II ESA of the Site have been completed by others. Prior geotechnical investigations have also been conducted at the Site that included but were not limited to lithologic descriptions, gradation testing and the development of grain size distribution curves. There were no current recognized environmental conditions in connection with the Site identified during the completion of the ESAs at the time they were completed. However, a former gasoline station at the southeast corner of the Site was identified as a historical recognized environmental condition in connection with the Site. During the decommissioning of the fueling systems associated with the station in 1988, four underground storage tanks (USTs) ranging in capacity from 500 gallons to 12,000 gallons were removed. No impacts of significance were reportedly identified in the area of three former gasoline USTs. However, impacted soil was encountered in the area of a former waste oil UST and additional assessment was required by the County of San Diego Department of Environmental Health (DEH). Following the additional assessment work that was conducted to delineate the extent of impact in the UST area, remedial

excavation was conducted and any remaining impacted soil was reportedly removed. The DEH subsequently issued a no further action letter for the Site.

The Site Plan included as Figure 3 depicts the locations of the former USTs and dispenser islands. A copy of documentation indicating the closed regulatory status by the DEH is included in Attachment A. Also included in this attachment are plan view and cross-sectional drawings extracted from prior environmental documents pertaining to the Site and a cross-sectional diagram of the former gasoline station area prepared by the project civil engineer.

There have been no other known previous subsurface environmental assessments completed at the Site. In addition, the Site is not listed on any environmental regulatory databases in connection with current hazardous waste generation, hazardous materials use and/or unauthorized releases of hazardous substances and/or petroleum products.

There are no planned environmental remedial excavation activities planned for the Site at this time. However, in the unlikely event that any petroleum hydrocarbon or other impacted soil (any analytes referenced in the Inland Testing Manual (ITM) list) is encountered during mass grading activities, such soil would be delivered to a licensed and regulated landfill facility, and not to the proposed Fletcher Cove discharge location or another upland location. There have also been no known prior environmental remediation activities conducted at the potential Fletcher Cove receiving location. It should be known that there are numerous conventional storm drain inlets associated with the municipal stormwater conveyance system maintained by the City of Solana Beach that lead to Fletcher Cove and the Pacific Ocean. However, there is reportedly no active 303(d) listing or Total Maximum Daily Load (TMDL) development or monitoring requirements for the proposed Fletcher Cove receiving location and associated nearshore waters of the Pacific Ocean.

1.4 Project Objective

The primary objective of this SAP is to develop a program to assess the potential physical and chemical compatibility of soil at the Site relative to export and reuse to the Pacific Ocean shoreline at Fletcher Cove Beach in Solana Beach for beach nourishment purposes. Fletcher Cove Beach has an established Sand Compatibility Opportunistic Use Program (SCOUP) which allows for the streamlined approval of compatible upland materials for beach nourishment. The location of the Fletcher Cove Beach receiving location is depicted on Figure 4 of this SAP. This SAP has also been developed to ensure adequate soil characterization through the implementation of a project-specific sampling plan such that representative samples are collected in a timely and cost-effective manner. Soil sampling and analytical methods specified in this SAP are primarily environmental in nature. However, geotechnical laboratory testing (grain size analysis) of soil samples will also be conducted during the SAP implementation. Relative to a final evaluation of geotechnical compatibility of Site soils relative to the potential discharge at Fletcher Cove, grain envelope size information for the Fletcher Cove location from 2013 has been provided by the City of Solana Beach. The City has directed the developer and its consultants to utilize the 2013 data for the purposes of decision making relative to geotechnical suitability of on-Site soils.

Based on a preliminary review of Site geotechnical data and the historical use of the Site for agricultural purposes and a portion of the Site as a gasoline service station, AEC acknowledges that there may be challenges involved in obtaining approval from agencies for the discharge of soil from the Site to the Fletcher Cove receiving location. Regardless, Zephyr has elected to continue with the proposed assessment work to evaluate the feasibility of such a discharge prior to evaluating a contingency plan for the export of Site soils to one or more upland receiving locations during the planned construction activities.

The project team consists of Zephyr Partners as project proponent/applicant the City of Solana Beach as local governmental agency, AEC as the current environmental consultant and Nova Engineering as the current geotechnical consultant. The current authorized representative for field activities and consultant project manager is Dan Weis of AEC. Environmental testing of Site soils is currently

anticipated to be conducted by American Environmental Testing Laboratory (AETL) of Burbank, California and its partner laboratories. AETL is certified through the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP). The ELAP certificate number for AETL is #1541. Geotechnical testing of Site soils was completed by Nova at their in-house laboratory. AEC and Nova intend to collaborate on the project relative to data collection/analysis and future results evaluation to be presented in the SAP Results Report (SAPR). However, it should be noted that Zephyr does reserve the right to retain other consultants and laboratories to implement this SAP. If such a situation arises, the United States Army Corps of Engineers and United States Environmental Protection Agency will be notified of any changes to the consulting team.

2.0 GEOLOGICAL AND HYDROGEOLOGICAL SETTING

The Site lies within the Peninsular Ranges Geologic Province of California. This geomorphic province is traversed by a group of northwest trending sub-parallel fault zones and encompasses an area that extends 125 miles from the Transverse Ranges and the Los Angeles Basin south to the Mexican Border and beyond another 775 miles to the tip of Baja California. Rocks within the Peninsular Range Province were emplaced during Cretaceous age orogenic events and uplifted into the present mountain ranges during the late Tertiary and Quaternary. Igneous, metamorphic and sedimentary rocks are all found within the Peninsular Ranges. The area is seismically active, with several known active faults crossing the Province.

The Site sits atop a coastal terrace, approximately 1,000 feet east of a coastal bluff which drops toward the beach and ocean. The Site is underlain by Pleistocene-aged Old Paralic Deposits. The Paralic deposits consist of strandline, beach, estuarine and colluvial siltstones, sandstones and conglomerates. As encountered at the Site during prior geotechnical studies, the Paralics consist of light brown to reddish brown, damp to moist, weakly to moderately cemented, weathered, friable, silty sandstone. As is typical of many urbanized sites, the Paralics are overlain by a veneer of artificial fill material which appears to be relatively shallow. The Old Paralic deposits occur widely, found from the International Border to northern Carlsbad and comprising the dominant near-surface geologic formation in much of San Diego. It is the paralic deposits that provide relatively higher-quality foundation support for civil development in San Diego. The unit ranges to 65 feet in thickness but is generally less than 50 feet in thickness.

According to the Water Quality Control Plan for the San Diego Basin, the Site is situated within the Rancho Santa Fe Hydrologic Sub-area of the Solana Beach Hydrologic Area of the San Dieguito Hydrologic Unit. Groundwater in the Solana Beach Hydrologic Area has municipal, agricultural and industrial supply use designations. The depth to groundwater in the area is anticipated to be greater than 50 feet below ground surface. The anticipated groundwater flow direction is towards the Pacific Ocean to the west in accordance with surface topography. Surface runoff at the Site and along adjacent roadways is expected to occur as sheet flow. Surface drainage at the Site is facilitated by nearby municipal storm drains along public roadways which are maintained by the City of Solana Beach. The Site does not appear to receive significant drainage from off-Site properties.

3.0 FIELD INVESTIGATION

3.1 Preliminary Field Activities

The following tasks will be performed before the commencement of field sampling activities:

- A permit for the drilling of the soil borings will either be procured with the County of San Diego DEH.
- Field representatives will complete Site visits to confirm/mark-out the locations of proposed sampling locations and to confirm the feasibility of access (where applicable).
- All equipment to be used during the sampling events will be inspected, pre-cleaned and decontaminated.
- All forms to be used in the field (i.e., logbook, chain-of-custody forms, etc.) will be assembled.
- Sampling personnel will review the sampling protocols. In addition, health and safety protocols will be reviewed.
- Dig Alert notifications will be conducted in accordance with State law. A private utility locating subcontractor may also be retained to clear the planned soil boring locations prior to drilling.

3.2 Sampling Methodology

Eight borings are proposed to be drilled at the Site to depths of 20 feet below existing grades. Figure 3 of this SAP depicts the planned locations of the soil borings. Three of the soil borings will be drilled in the southeastern portion of the Site (former gasoline station area) and more specifically in the areas of the former fuel dispenser islands, gasoline USTs, and waste oil UST. The remaining five soil borings will be drilled in other areas throughout the Site that will be subject to future mass excavation/construction activities.

The borings will be drilled by a C-57 licensed drilling contractor using direct-push sampling methods. Soil samples will be obtained at depths of one foot and at five-foot depth increments into acetate sleeves. The sleeves will be sealed with Teflon® sheets, capped, labeled, and placed into chilled coolers for transport to the appropriate laboratories. A total of 40 soil samples will be obtained during the SAP implementation.

Table 3-1 – Core Sampling Information

Boring ID	Latitude	Longitude	Target Sample Depths (Feet)	Geotechnical Grain Size	Chemistry Testing (1)	Chemistry Testing (2)	Archive (3)	
B1	32.987623	-117.271237	1	X	X (Composite B1-B3)	X (Composite All Depths)	X	
			5	X			X	
			10	X			X	
			15	X			X	
			20	X			X	
B2	32.987626	-117.271040	1	X		X (Composite B1-B3)	X (Composite All Depths)	X
			5	X				X
			10	X				X
			15	X				X
			20	X				X
B3	32.987537	-117.271013	1	X		X (Composite B1-B3)	X (Composite All Depths)	X
			5	X				X
			10	X				X
			15	X				X
			20	X				X

B4	32.987478	-117.271593	1	X	X (Composite B4-B8)	X (Composite All Depths)	X			
			5	X			X			
			10	X			X			
			15	X			X			
			20	X			X			
B5	32.987657	-117.271845	1	X		X (Composite B4-B8)	X (Composite All Depths)	X		
			5	X				X		
			10	X				X		
			15	X				X		
			20	X				X		
B6	32.987832	-117.271589	1	X			X (Composite B4-B8)	X (Composite All Depths)	X	
			5	X					X	
			10	X					X	
			15	X					X	
			20	X					X	
B7	32.987935	-117.271322	1	X				X (Composite B4-B8)	X (Composite All Depths)	X
			5	X						X
			10	X						X
			15	X						X
			20	X						X
B8	32.987776	-117.271202	1	X	X (Composite B4-B8)				X (Composite All Depths)	X
			5	X						X
			10	X						X
			15	X						X
			20	X						X

- (1) Initial round of testing for chemicals of concern (full ITM list). Former gasoline station borings (B1, B2 and B3) to be analyzed as a separate composite.
- (2) Next round of testing for chemicals of concern (those exceeding effects range lows (ERLs)) if needed. Composite samples from all depths in a given boring.
- (3) Third round of testing for chemicals of concern (those exceeding ERLs) if needed. Discrete samples comprising the composite(s) in question would be analyzed.

Chain-of-custody documentation will be provided for each environmental soil sample transferred to the laboratory. A log of each soil boring will be prepared in accordance with the USCS. QA/QC procedures to be used during soil sampling will include using stainless steel rods and sampling apparatus that have been steam cleaned prior to use and cleansing the sampling equipment in a non-phosphate detergent followed by successive rinses in drinking water. If conditions of potential concern (i.e. staining, odors, presence of deleterious material) are identified, they will be noted in the field log.

3.3 Laboratory Analysis

As depicted in the table above, a total of 40 soil samples (six from each soil boring) will be collected during the sampling activities (assuming adequate sample recovery). Target sample depths will be located at 1, 5, 10, 15 and 20 feet in each soil boring.

- All soil samples obtained during the drilling activities will be subject to gradation analysis (ASTM D6913), completed by the project geotechnical consultant.
- In soil borings B1, B2 and B3 (in the former gasoline station area), the analytical laboratory will be instructed to composite equal portions of the 15 discrete soil samples obtained from these borings. In soil borings B4, B5, B6, B7 and B8, the analytical laboratory will also be instructed to composite equal portions of the discrete samples obtained (25 total samples). The resultant two composite soil samples will be analyzed for the following list of analytes (full ITM list):

Table 3-2 – ITM Analyte List

GROUPING	Attribute	Units	ERL¹	ERM²	RSL³
Conventionals	Ammonia	mg/kg			
	Total Organic Carbon	mg/kg			
	Moisture	%			
	Volatile Solids	%			
	Total Recoverable Petroleum Hydrocarbons	mg/kg			
	Oil and Grease	mg/kg			
	Total Sulfide	mg/kg			
	Total Solids	%			
Metals	Arsenic	mg/kg	8.2	70	4.5
	Cadmium	mg/kg			
	Chromium	mg/kg	81	370	
	Copper	mg/kg	34	270	
	Lead	mg/kg	46.7	218	
	Mercury	mg/kg			
	Nickel	mg/kg	20.9	51.6	
	Selenium	mg/kg			
	Silver	mg/kg	1	3.7	
	Zinc	mg/kg	150	410	
Organotins	Dibutyltin	microg/kg			
	Monobutyltin	microg/kg			
	Tetrabutyltin	microg/kg			
	Tributyltin	microg/kg			
SVOCs - PAHs	1-Methylnapthalene	microg/kg			
	2-Methylnapthalene	microg/kg			
	2,4,5-Trichlorophenol	microg/kg			
	2,4,6-Trichlorophenol	microg/kg			180000
	2,4-Dichlorophenol	microg/kg			
	2,4-Dimethylphenol	microg/kg			
	2,4-Dinitrophenol	microg/kg			
	2-Chlorophenol	microg/kg			
	2-Methylnapthalene	microg/kg			
	Acenaphthene	microg/kg	16	500	
	Acenaphthylene	microg/kg	44	640	
	Anthracene	microg/kg	85.8	1100	
	Benzo(a)anthracene	microg/kg	261	1600	530
	Benzo(a)pyrene	microg/kg	430	1600	53
	Benzo (b) Fluoranthene	microg/kg			530
	Benzo (g,h,i) Perylene	microg/kg			
	Benzo (k) Fluoranthene	microg/kg			
	Chrysene	microg/kg	384	2800	53000
Dibenz (a,h) Anthracene	microg/kg	63.4	260	53	

¹ NOAA Effects Range Low

² NOAA Effects Range Medium

³ EPA Regional Screening Level for dermal exposure cancer risk

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³
	Fluoranthene	microg/kg	600	5100	
	Fluorene	microg/kg	19	540	
	Indeno (1,2,3-c,d) Pyrene	microg/kg			530
	Naphthalene	microg/kg	160	2100	
	N-Nitrosodimethylamine	microg/kg			
	Pentachlorophenol	microg/kg			
	Phenanthrene	microg/kg	240	1500	
	Pyrene	microg/kg	665	2600	
	Total PAHs	microg/kg	4022	44792	
PCBs and PCB Congeners	PCB 018	microg/kg			
	PCB 028	microg/kg			
	PCB 037	microg/kg			
	PCB 044	microg/kg			
	PCB 049	microg/kg			
	PCB 052	microg/kg			
	PCB 066	microg/kg			
	PCB 070	microg/kg			
	PCB 074	microg/kg			
	PCB 077	microg/kg			110
	PCB 081	microg/kg			110
	PCB 087	microg/kg			
	PCB 099	microg/kg			
	PCB 101	microg/kg			
	PCB 105	microg/kg			110
	PCB 110	microg/kg			
	PCB 114	microg/kg			2.2
	PCB 118	microg/kg			110
	PCB 119	microg/kg			
	PCB 123	microg/kg			110
	PCB 126	microg/kg			0.11
	PCB 128	microg/kg			
	PCB 138	microg/kg			
	PCB 149	microg/kg			
	PCB 151	microg/kg			
	PCB 153	microg/kg			
	PCB 156	microg/kg			22
	PCB 157	microg/kg			22
	PCB 158	microg/kg			
	PCB 167	microg/kg			1100
PCB 168	microg/kg				
PCB 169	microg/kg			1.1	
PCB 170	microg/kg				
PCB 177	microg/kg				
PCB 180	microg/kg				
PCB 183	microg/kg				
PCB 187	microg/kg				

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³
	PCB 189	microg/kg			110
	PCB 194	microg/kg			
	PCB 201	microg/kg			
	PCB 206	microg/kg			
	Total PCBs	microg/kg	22.7	180	
Organochlorine Pesticides	2,4'-DDD	microg/kg			
	2,4'-DDE	microg/kg			
	2,4'-DDT	microg/kg			
	4,4'-DDD	microg/kg	2	20	8400
	4,4'-DDE	microg/kg	2.2	27	6000
	4,4'-DDT	microg/kg	1	7	20000
	DDTs	microg/kg	1.58	46.1	
	Aldrin	microg/kg			
	Alpha-BHC	microg/kg			
	Beta-BHC	microg/kg			
	Chlordane	microg/kg	0.5	6	14000
	Delta-BHC	microg/kg			
	Dieldrin	microg/kg	0.02	8	130
	Endosulfan I	microg/kg			
	Endosulfan II	microg/kg			
	Endosulfan Sulfate	microg/kg			
	Endrin	microg/kg			
	Endrin Aldehyde	microg/kg			
	Endrin Ketone	microg/kg			
	Gamma-BHC	microg/kg			
	Heptachlor	microg/kg			
	Heptachlor Epoxide	microg/kg			220
Methoxychlor	microg/kg				
Toxaphene	microg/kg			1800	
SVOCs - Phthalates	Bis(2-Ethylhexyl) Phthalate	microg/kg			
	Butylbenzyl Phthalate	microg/kg			
	Diethyl Phthalate	microg/kg			
	Dimethyl Phthalate	microg/kg			
	Di-n-butyl Phthalate	microg/kg			
	Di-n-octyl Phthalate	microg/kg			
SVOCs - Phenols	2-Methylphenol	microg/kg			
	2-Nitrophenol	microg/kg			
	3,4-Methylphenol	microg/kg			
	4,6-Dinitro-2-Methylphenol	microg/kg			
	4-Chloro-3-Methylphenol	microg/kg			
	Bisphenol A	microg/kg			
	Total phenols	microg/kg			
Pesticides - Pyrethroids	Allethrin (Bioallethrin)	microg/kg			
	Bifenthrin	microg/kg			
	Cyfluthrin-beta (Baythroid)	microg/kg			
	Cyhalothrin-Lamba	microg/kg			

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³
	Cypermethrin	microg/kg			
	Deltamethrin (Decamethrin)	microg/kg			
	Esfenvalerate	microg/kg			
	Fenpropathrin (Danitol)	microg/kg			
	Fenvalerate (sanmarton)	microg/kg			
	Fluvalinate	microg/kg			
	Permethrin (cis and trans)	microg/kg			
	Resmethrin (Bioresmethrin)	microg/kg			
	Resmethrin	microg/kg			
	Sumithrin (Phenothrin)	microg/kg			
	Tetramethrin	microg/kg			
Tralomethrin	microg/kg				
Volatile Organic Compounds	1,1,1,2-Tetrachloroethane	microg/kg			
	1,1,1-Trichloroethane	microg/kg			
	1,1,2,2-Tetrachloroethane	microg/kg			
	1,1,2-Trichloroethane	microg/kg			
	1,1-Dichloroethane	microg/kg			
	1,1-Dichloroethene	microg/kg			
	1,1-Dichloropropene	microg/kg			
	1,2,3-Trichlorobenzene	microg/kg			
	1,2,3-Trichloropropane	microg/kg			
	1,2,4-Trichlorobenzene	microg/kg			
	1,2,4-Trimethylbenzene	microg/kg			
	1,2-Dibromo-3-Chloropropane	microg/kg			
	1,2-Dibromoethane	microg/kg			
	1,2-Dichlorobenzene	microg/kg			
	1,2-Dichloroethane	microg/kg			
	1,2-Dichloropropane	microg/kg			
	1,3,5-Trimethylbenzene	microg/kg			
	1,3-Dichlorobenzene	microg/kg			
	1,3-Dichloropropane	microg/kg			
	1,4-Dichlorobenzene	microg/kg			
	2,2-Dichloropropane	microg/kg			
	2-Butanone (Methylethyl ketone [MEK])	microg/kg			
	2-Chloroethyl Vinyl ether	microg/kg			
	2-Chlorotoluene	microg/kg			
	2-Hexanone	microg/kg			
	4-Chlorotoluene	microg/kg			
	4-Methyl-2-Pentanone	microg/kg			
	Acetone	microg/kg			
	Benzene	microg/kg			
	Bromobenzene	microg/kg			
Bromochloromethane	microg/kg				
Bromodichloromethane	microg/kg				
Bromoform	microg/kg				
Bromomethane	microg/kg				

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³
	Carbon Disulfide	microg/kg			
	Carbon Tetrachloride	microg/kg			
	Chlorobenzene	microg/kg			
	Chloroethane	microg/kg			
	Chloroform	microg/kg			
	Chloromethane	microg/kg			
	cis-1,2-Dichloroethene	microg/kg			
	cis-1,3-Dichloropropene	microg/kg			
	Dibromochloromethane	microg/kg			
	Dibromomethane	microg/kg			
	Dichlorodifluoromethane	microg/kg			
	Ethylbenzene	microg/kg			
	Hexachlorobutadiene	microg/kg			
	Isopropylbenzene	microg/kg			
	Methylene Chloride	microg/kg			
	MTBE	microg/kg			
	n-Butylbenzene	microg/kg			
	n- Propylbenzene	microg/kg			
	Naphthalene	microg/kg			
	p- Isopropyltoluene	microg/kg			
	sec-Butylbenzene	microg/kg			
	Styrene	microg/kg			
	tert-Butylbenzene	microg/kg			
	Tetrachloroethene	microg/kg			
	Toluene	microg/kg			
	trans-1,2-Dichloroethene	microg/kg			
	trans-1,3-Dichloropropene	microg/kg			
	Trichloroethene	microg/kg			
	Trichlorofluoromethane	microg/kg			
	Vinyl Acetate	microg/kg			
	Vinyl Chloride	microg/kg			
	o-xylene	microg/kg			
	m,p-xylenes	microg/kg			
Total Petroleum Hydrocarbons	TPH as Gasoline and Light Hydrocarbons	mg/kg			
	TPH as Diesel and Heavy Hydrocarbons	mg/kg			
Dioxins and Furans	All Dioxins and Furans (See Squirts Quick Reference Tables)	pg/g			

- In the event that one of more analytes are found to exceed ERLs in the composite sample of soil from borings B1, B2, and B3, the second tier composites from all depths within each of the three borings (total of three additional composites) would be analyzed for the contaminants that exceeded the ERLs.
- In the event that one of more analytes are found to exceed ERLs in the composite sample of soil from borings B4 through B8, the second tier composites from all depths within each of

the five borings (total of five additional composites) would be analyzed for the contaminants that exceeded the ERLs.

- In the event that one or more analytes are found to exceed ERLs in the second tier composite samples of soil from each of the eight borings, all discrete soil samples obtained from the applicable boring(s) containing the elevated detection(s) would be analyzed for the contaminants that exceeded the ERLs.
- The preliminary chemistry data from the first round of testing will be sent to USACE and EPA for review before additional testing of higher resolution samples is conducted, if necessary. This approach will also apply to any subsequent rounds of testing, if necessary.
- In the event that after three rounds of chemical testing, exceedances of ERLs are demonstrated, bioassay tests will be required to determine suitability for aquatic placement. If such testing is required, the USACE and EPA will be consulted prior to initiating such laboratory analyses.

Lists of the inorganic and organic analytes to be evaluated and their respective target laboratory method detection limits (MDLs) are included in Attachment B of this SAP:

3.4 Laboratory Detection Limits

Environmental laboratory method detection and reporting limits will be sufficient for the evaluation of such soil being utilized at an educational related facility. Lists of such limits are also included in Attachment A of this SAP.

3.5 Sample Collection Procedures

3.5.1 Sample Containers, Labels and Preservation

As stated previously, soil samples to be obtained during the field sampling will be collected into acetate sleeves. The sample labels will be firmly attached to the containers, and the following information will be printed on the label:

- Project name and number
- Sample location and analytical parameters
- Test pit number
- Sample identification number
- Sample collector's initials
- Date and time of collection

With the exception of field preservation kits for volatile organic compound analysis, preservatives will not be required for the soil samples. All soil samples will be properly prepared for transportation to the environmental analytical laboratory by placing the samples in coolers containing ice to maintain a shipping temperature of 4°C +/- 2°C.

3.5.2 Sample Packaging and Shipment

Once environmental soil samples are obtained, they will be placed immediately in the cooler on ice to maintain the samples at 4°C +/- 2°C. The field sampler will indicate the sample designation/location number and date and time of collection in the space provided on the chain-of-custody for each sample. After the samples are sealed and labeled, they will be packaged for transport to the analytical laboratory with chain-of-custody forms placed on the inside of the lids of the coolers. The samples will be packaged so that they will not leak or spill from the containers. It is AEC's intent to have the samples transported to the analytical laboratory at the

end of each sampling day. If samples are held overnight due to scheduling conflicts or logistical issues with respect to delivering samples prior to the lab closing, the samples will be stored in a secure location under chain-of-custody procedures and delivered the following day to the analytical laboratory.

3.5.3 Chain-of-Custody Protocol

After the environmental samples are collected, chain-of-custody procedures will be followed to establish a written record of sample handling and movement between the Site and the analytical laboratory. Each shipping container will have a chain-of-custody form completed in triplicate by the sampling personnel. One copy of this form will be kept by the sampling team and the other two copies will be sent to the laboratories. One of the laboratory copies will become a part of the permanent record for the sample and will be returned with the sample analytical results. The chain-of-custody will contain the following information:

- Sample identification number;
- Sample collector's printed name and signature;
- Date and time of collection;
- Place and address of collection;
- Sample matrix;
- Analyses requested;
- Signatures of individuals involved in the chain of possession; and
- Inclusive dates of possession

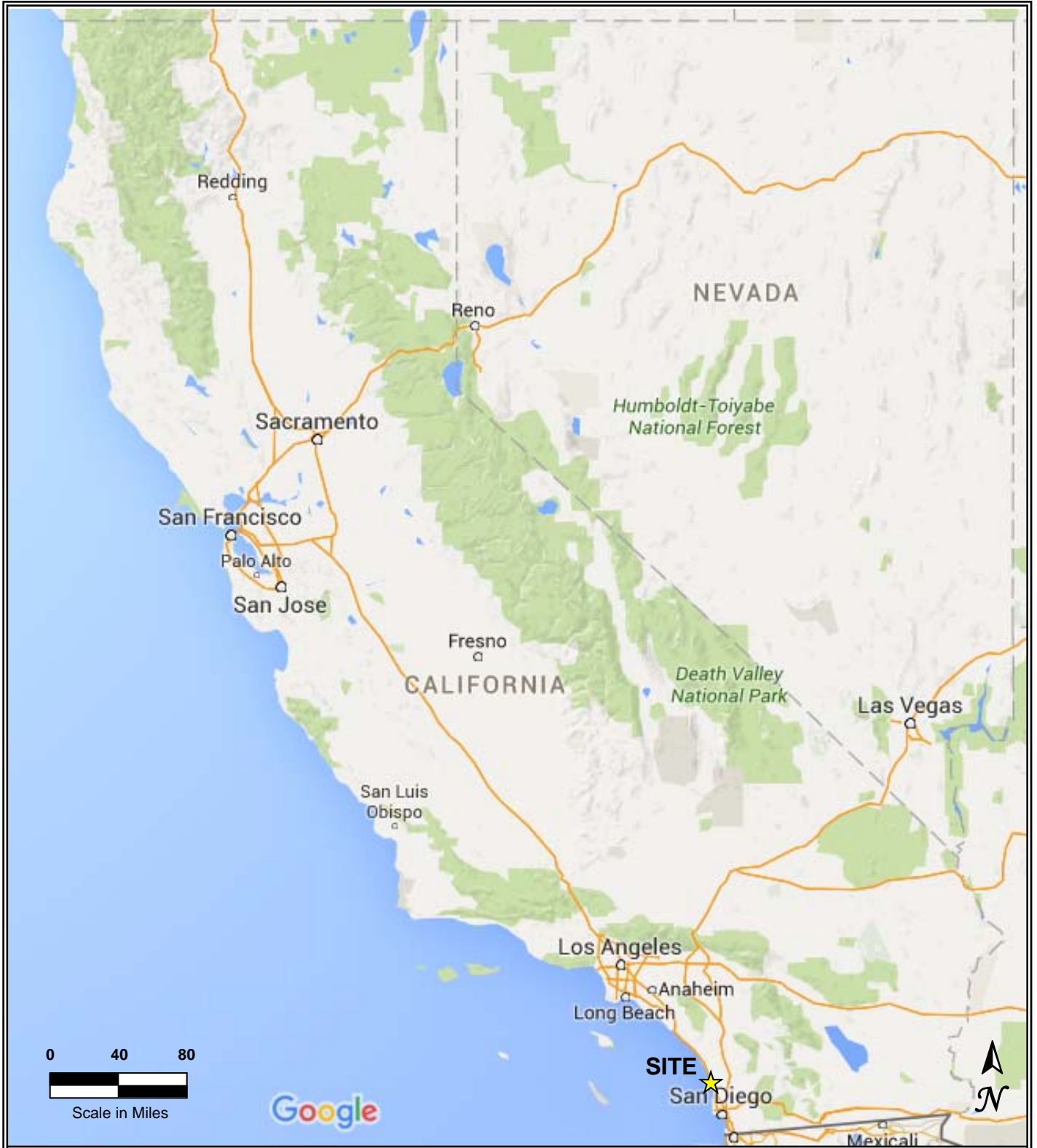
As stated previously, the chain-of-custody documentation will be placed inside the shipping container so that it will be immediately apparent to the laboratory personnel receiving the container, and will not be damaged or lost during transport.

4.0 REPORTING

A SAPR will be prepared that describes the results of the sampling and analysis proposed herein and the interpretation of existing geotechnical data and will present an evaluation of the investigation results relative to the potential physical and chemical compatibility of soil at the Site relative to possible export and reuse to the Pacific Ocean shoreline at Fletcher Cove Beach in Solana Beach.

Environmental screening levels to be utilized during the evaluation of Site soil will include at a minimum and as applicable, United States sediment benchmark ERLs and ERMs, and United States EPA Regional Screening Levels (RSLs). Other State or Local environmental regulatory agency recognized environmental screening levels may also be discussed in the SAPR if they are deemed applicable. The primary geotechnical related criteria that will be utilized in evaluating compatibility as described in the future SAPR will be fines content and color. The SAPR will be submitted concurrently to the United States Army Corps of Engineers, the United States EPA and the City of Solana Beach.

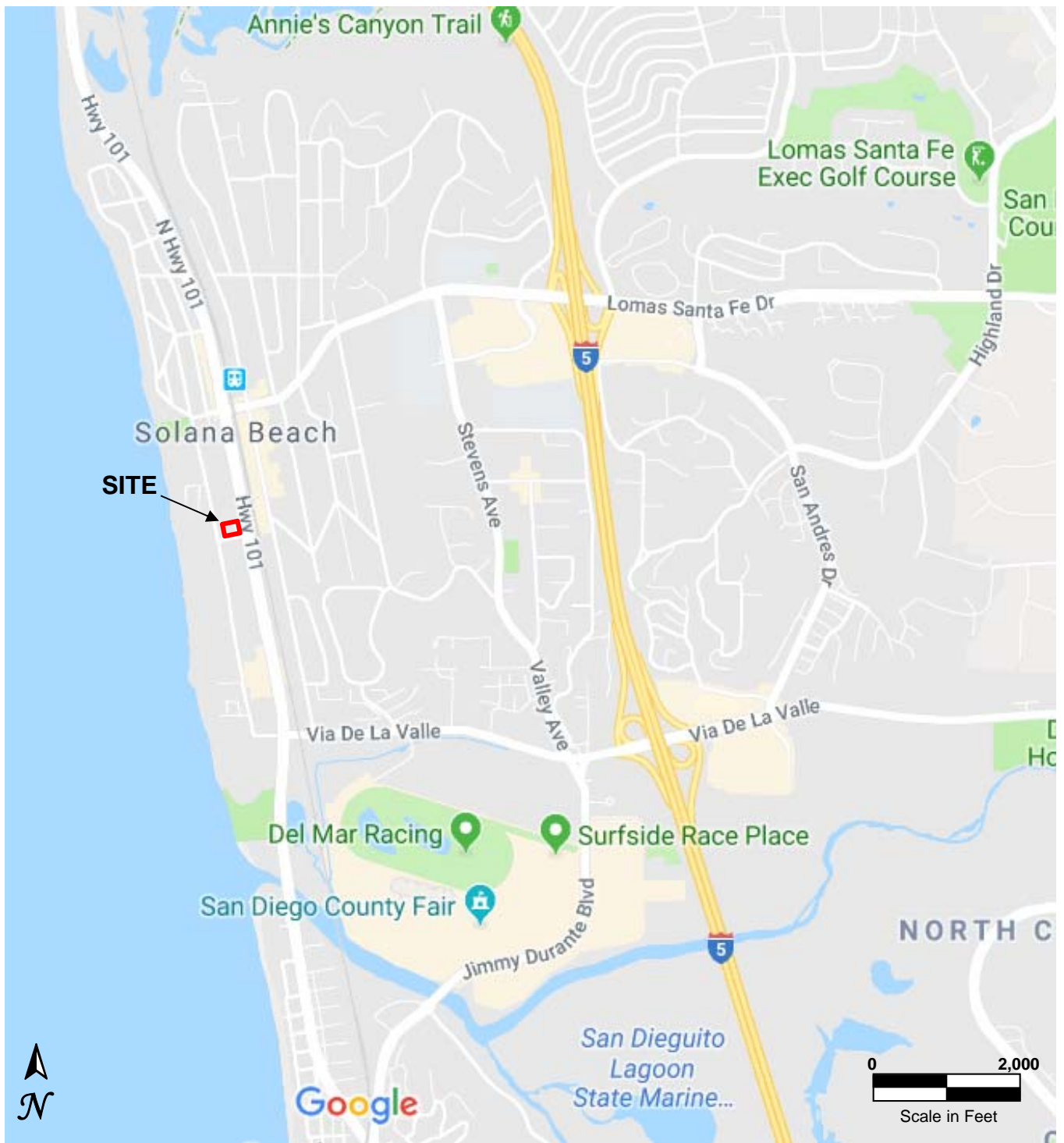
FIGURES



145 Vallecitos De Oro, Suite 201
 San Marcos, CA 92069
 Phone: 760-744-3363 Fax: 760-744-3383

FIGURE 1A
Vicinity Map – Solana Beach 101
 Highway 101 and Dahlia Drive
 Solana Beach, CA 92075

Work Order No.: 19-228SD	Figure Date: April 2019	Drawn By: TJ
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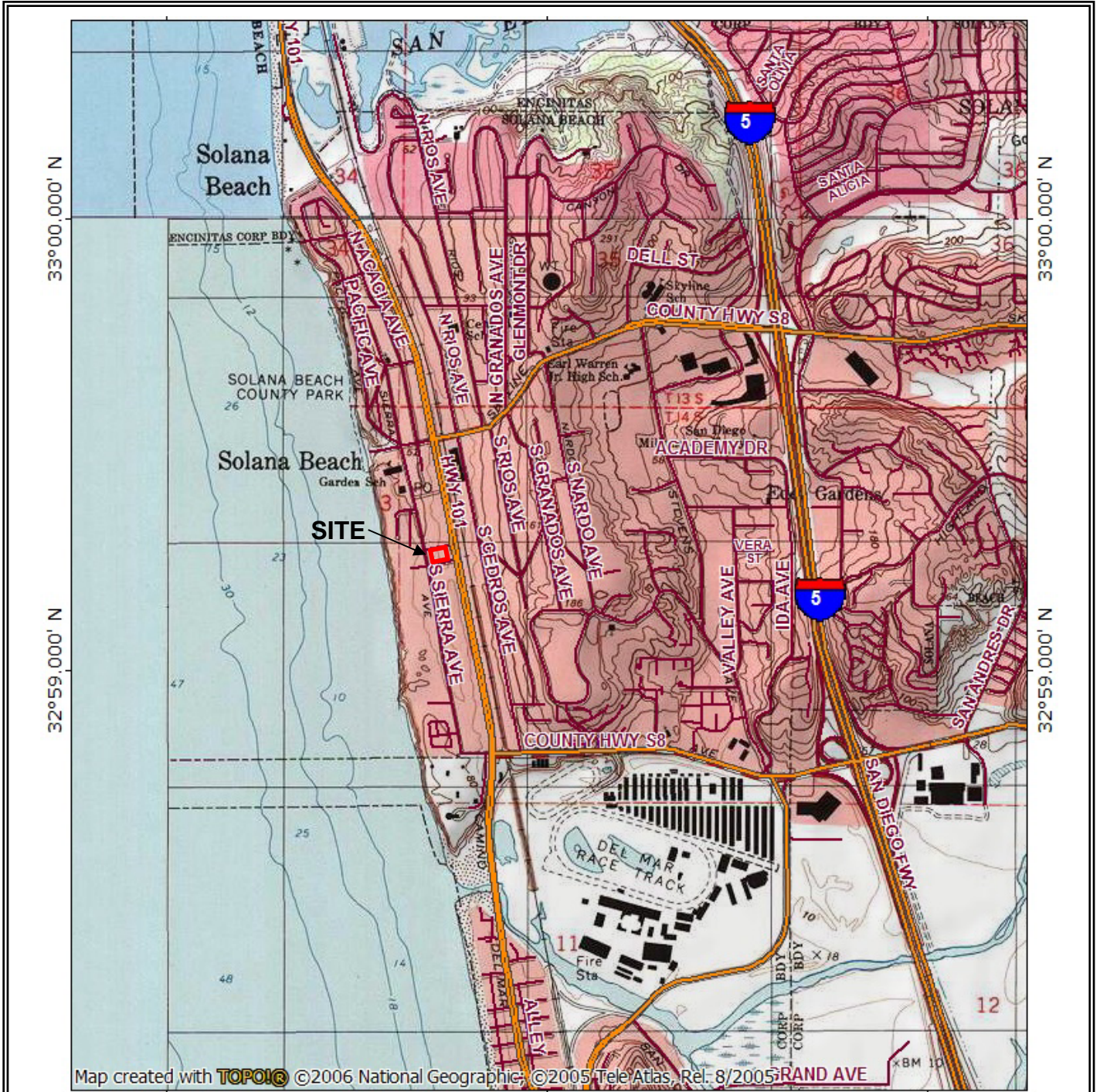
145 Vallecitos De Oro, Suite 201
 San Marcos, CA 92069
 Phone: 760-744-3363 Fax: 760-744-3383

Figure 1C
Vicinity Map - Solana Beach 101
 Highway 101 and Dahlia Drive
 Solana Beach, CA 92075

Work Order No.:
 19-228SD

Figure Date:
 April 2019

Drawn By:
 TJ

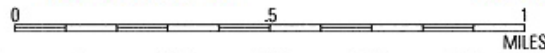


117°17.000' W

117°16.000' W

WGS84 117°15.000' W

Del Mar OEW, CA 1975
7.5' Topographic Quadrangle



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Phone: 760-744-3363 Fax: 760-744-3383

Figure 2
Topographic Map - Solana Beach 101
Highway 101 and Dahlia Drive
Solana Beach, CA 92075

Work Order No.:
19-228SD

Figure Date:
April 2019

Drawn By:
TJ



— Site Boundary

⊗ Proposed Boring Location

U Former USTs

I Former Dispenser Islands



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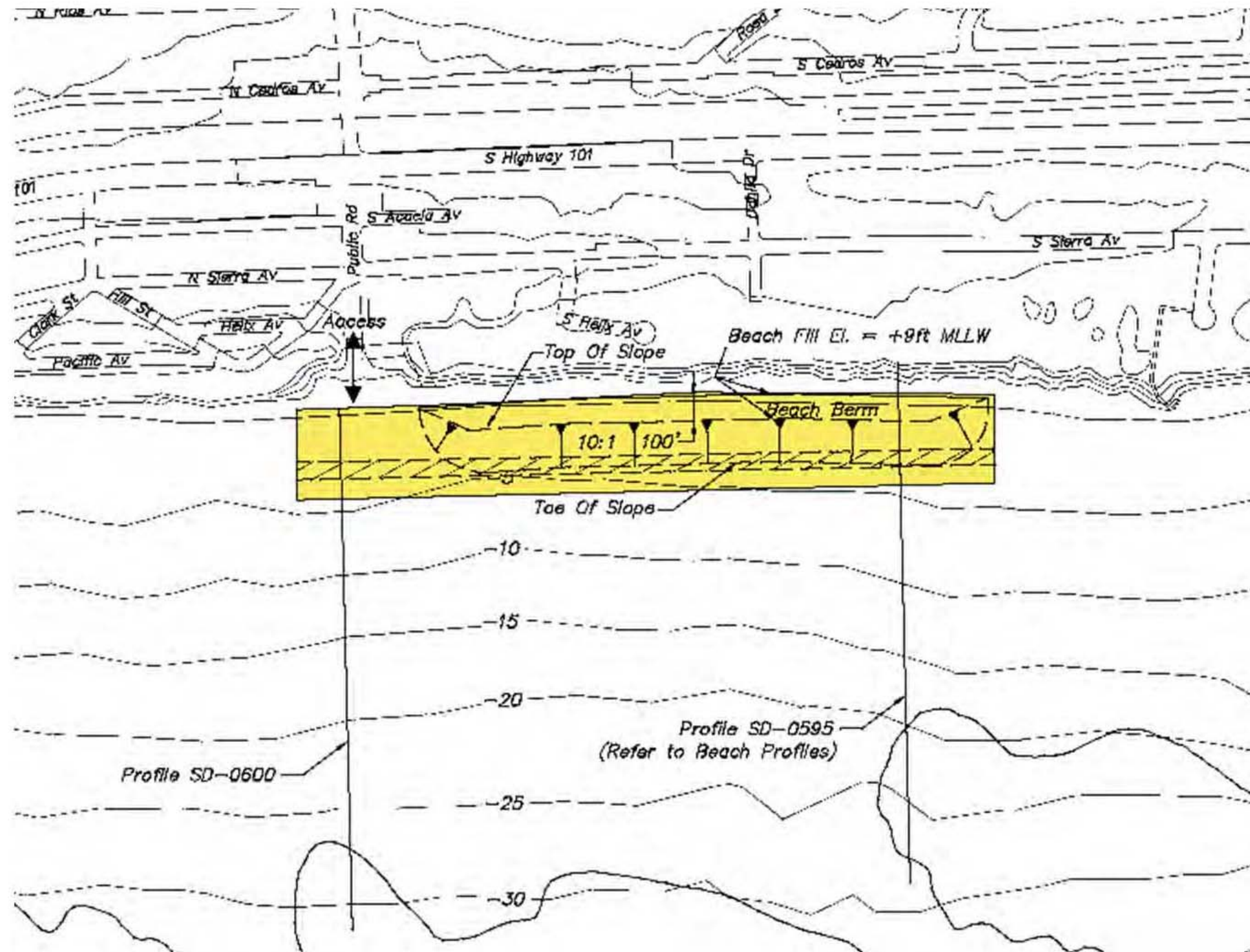
Phone: 760-744-3363
Fax: 760-744-3383

Figure 3 - Site Plan
Solana Beach 101
Highway 101 and Dahlia Drive
Solana Beach, CA 92075

Work Order No.:
19-228SD

Figure Date:
April 2019

Drawn By:
TJ



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San Marcos, CA 92069

Phone: 760-744-3363
Fax: 760-744-3383



Not To Scale

FIGURE 4
Fletcher Cove Beach Discharge Location
Solana Beach, California

Work Order No.:
19-228SD

Report Date:
April 2019

Drawn By:
DW

ATTACHMENT A
FORMER GASOLINE STATION INFORMATION

STATE WATER RESOURCES CONTROL BOARD GEOTRACKER



JUNE & MILTON ULLMAN (T0607303153) - [\(MAP\)](#)

[SIGN UP FOR EMAIL](#)

343 HY 101
SOLANA BEACH, CA 920751130
SAN DIEGO COUNTY
LUST CLEANUP SITE (INFO)
[PRINTABLE CASE SUMMARY](#) / [CSM REPORT](#)

CLEANUP OVERSIGHT AGENCIES
SAN DIEGO COUNTY LOP (**LEAD**) - CASE #: H26441-0
SAN DIEGO RWQCB (REGION 9) - CASE #: 9UT911
CUF Claim #:
CUF Priority Assigned:
CUF Amount Paid:

[Summary](#) [Cleanup](#) [Action Report](#) [Regulatory Activities](#) [Environmental Data \(ES\)](#) [Site Maps / Documents](#) [Community Involvement](#) [Related Cases](#) [LUST CUF Data](#)

Regulatory Profile

[PRINTABLE CASE SUMMARY](#)

CLEANUP STATUS - DEFINITIONS

COMPLETED - CASE CLOSED AS OF 6/13/1988 - [CLEANUP STATUS HISTORY](#)

POTENTIAL CONTAMINANTS OF CONCERN

NONE SPECIFIED

FILE LOCATION

LOCAL AGENCY

DWR GROUNDWATER SUB-BASIN NAME

POTENTIAL MEDIA OF CONCERN

NONE SPECIFIED

DESIGNATED GROUNDWATER BENEFICIAL USE(S) - DEFINITIONS

NONE

CALWATER WATERSHED NAME

San Dieguito - Solana Beach - Rancho Santa Fe (905.11)

Site History

No site history available

[Back to Top](#)

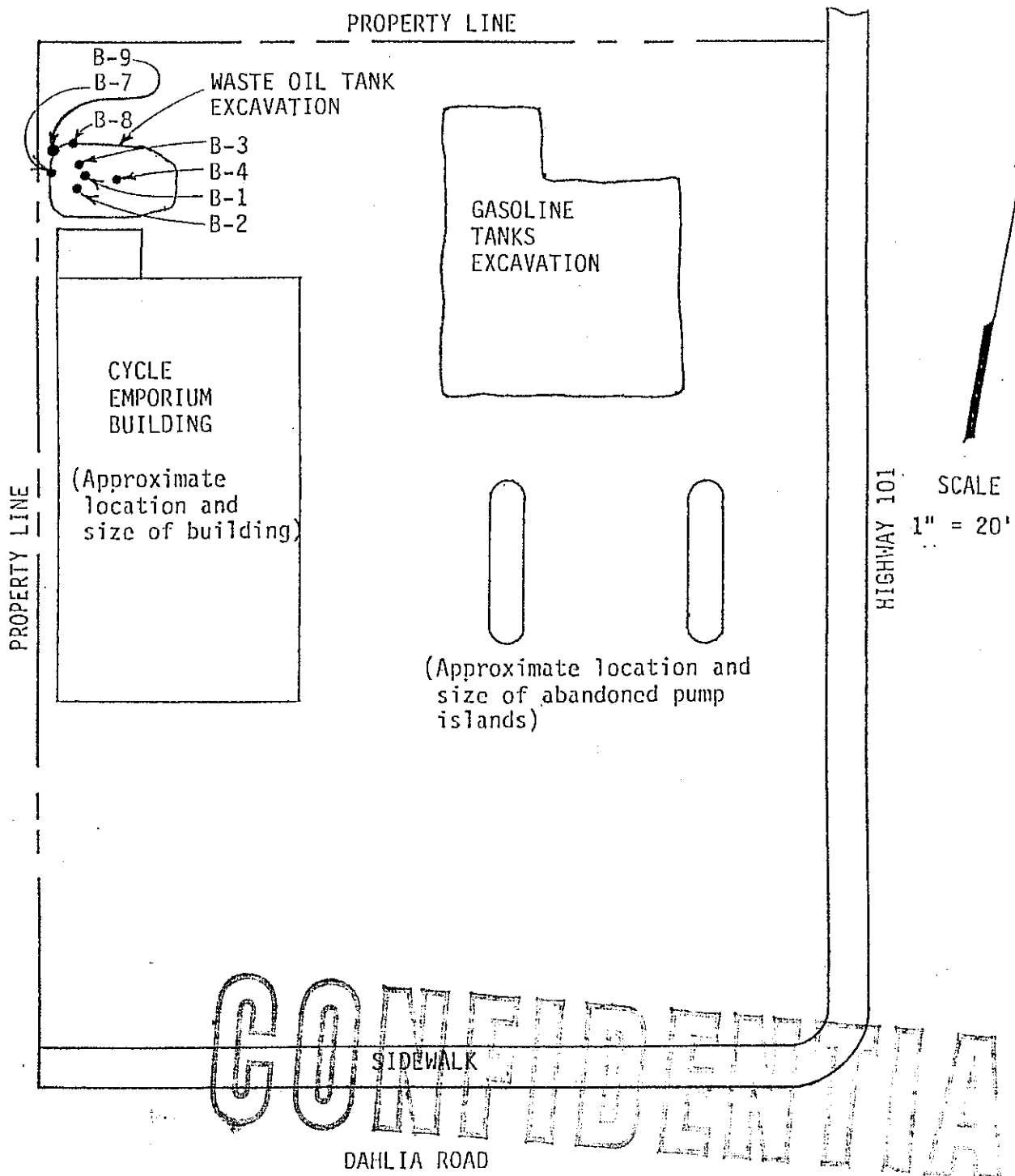
[Privacy Policy](#)

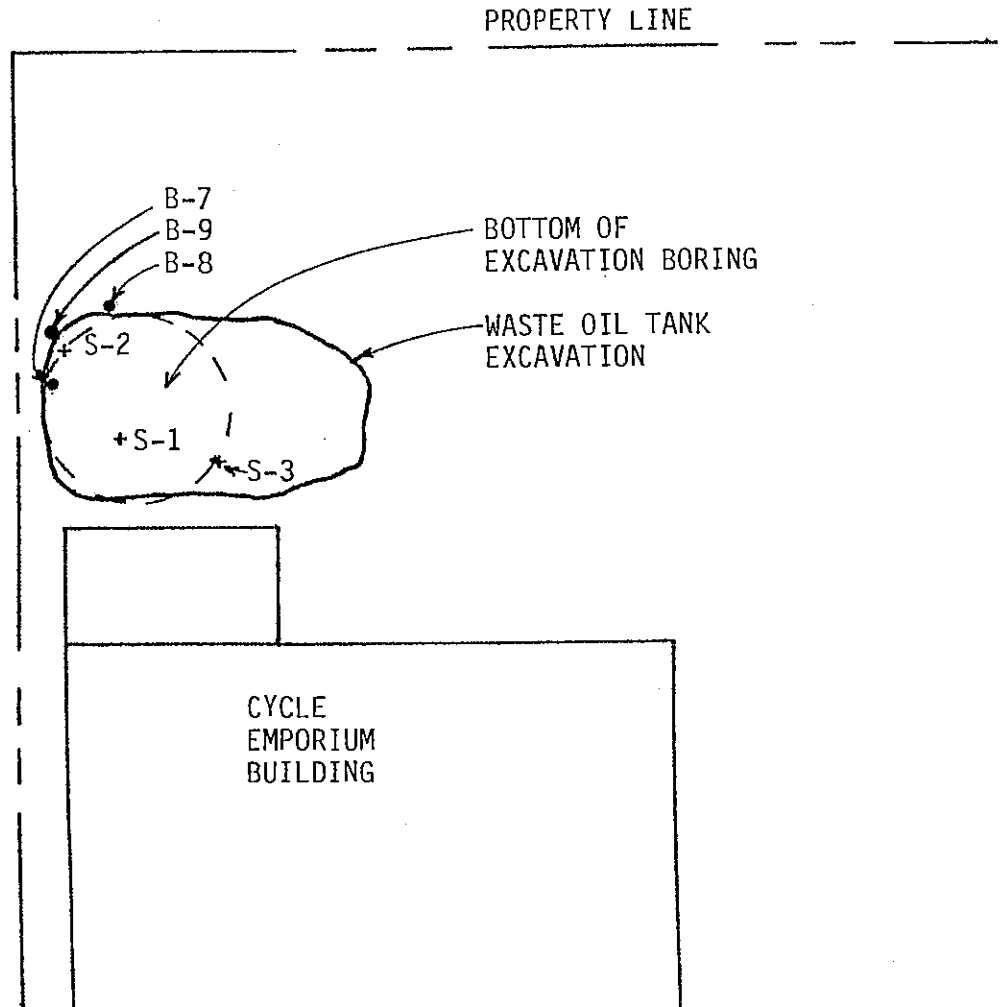
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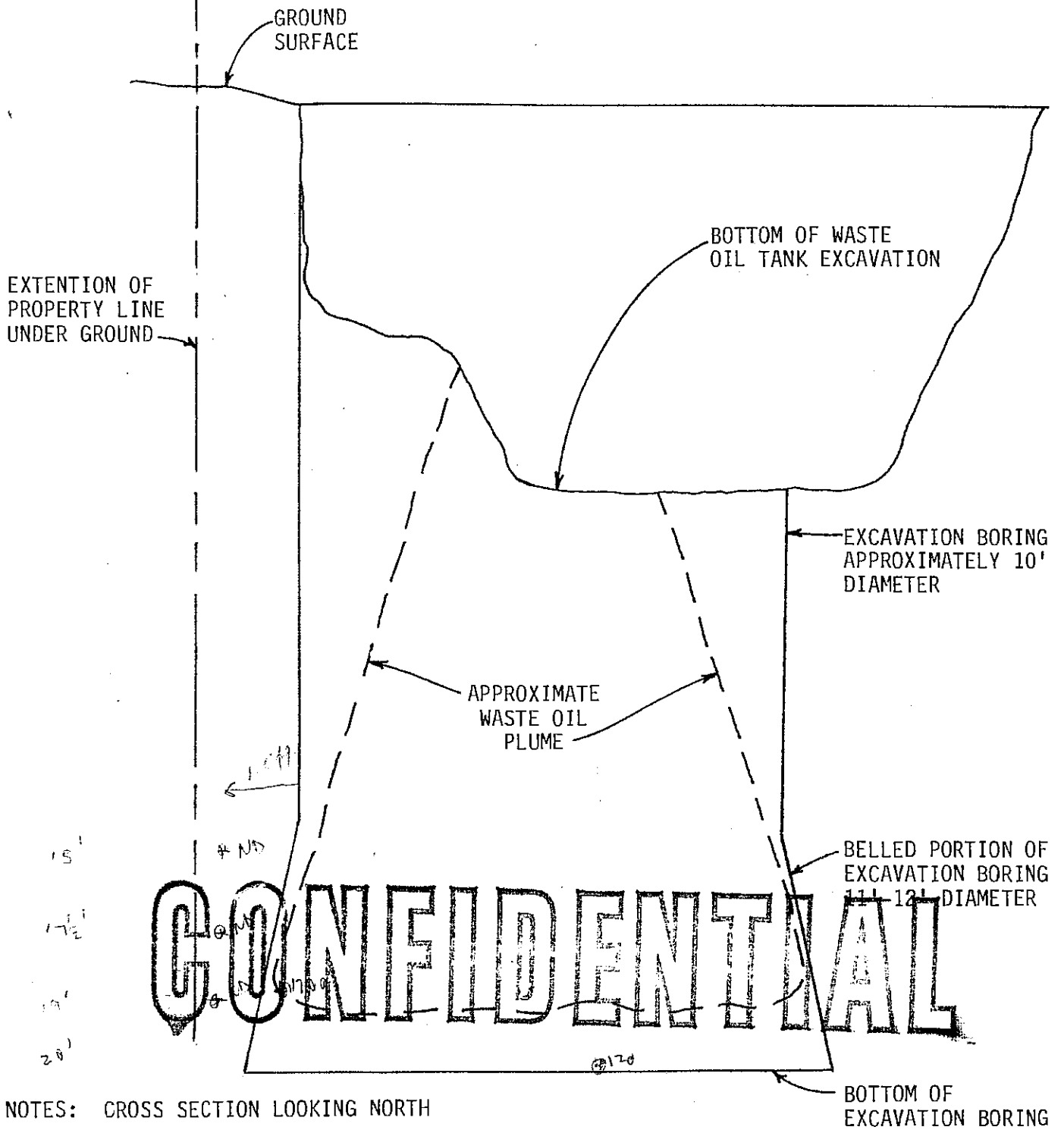
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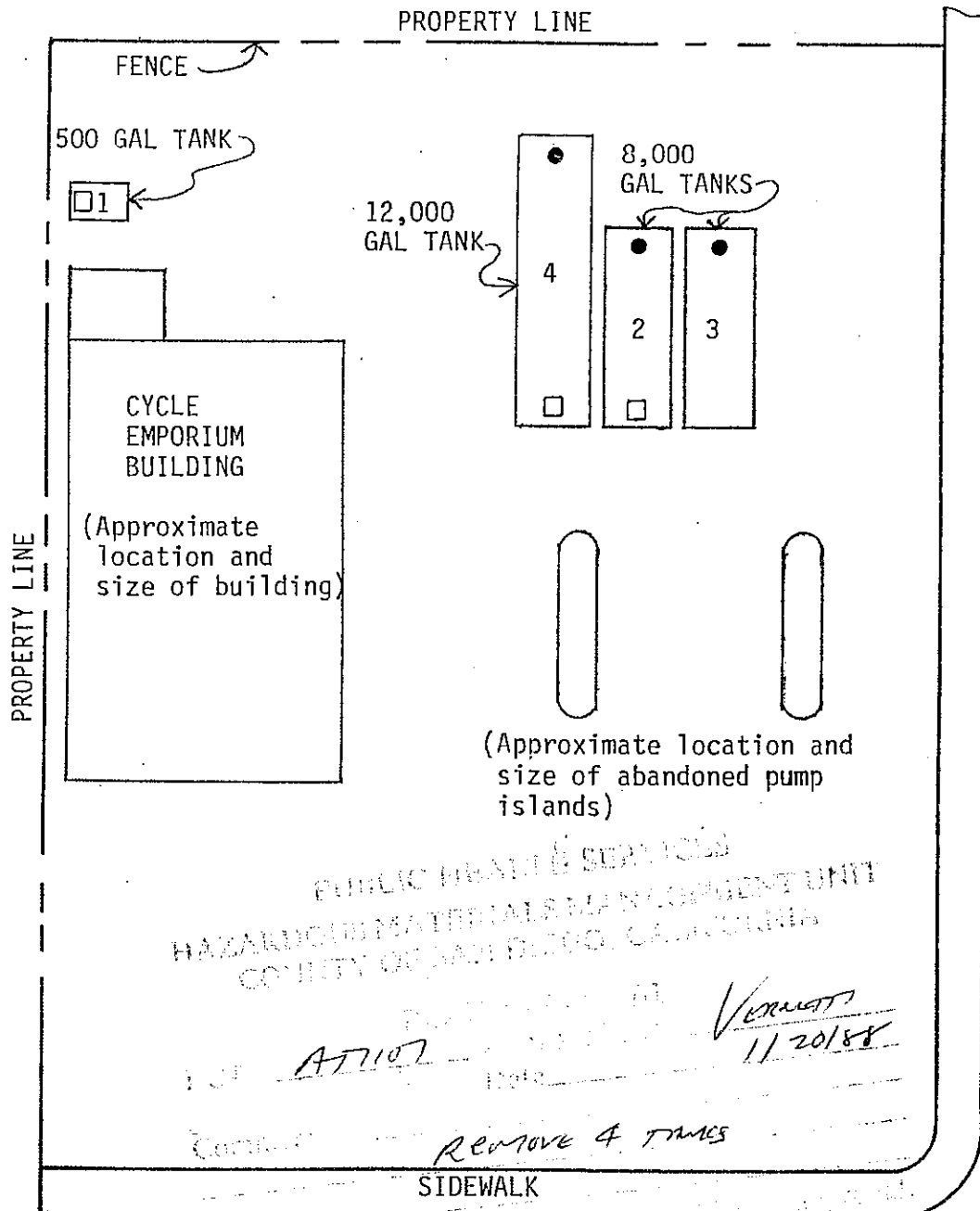


CONFIDENTIAL

SCALE 1" = 3'



NOTES: CROSS SECTION LOOKING NORTH
VERTICAL AND HORIZONTAL SCALE THE SAME



SCALE
1" = 20'

PUBLIC HEALTH SERVICES
HAZARDOUS MATERIALS MANAGEMENT UNIT
COUNTY OF SAN DIEGO, CALIFORNIA

AT 1107
Remove 4 tanks
11/20/88

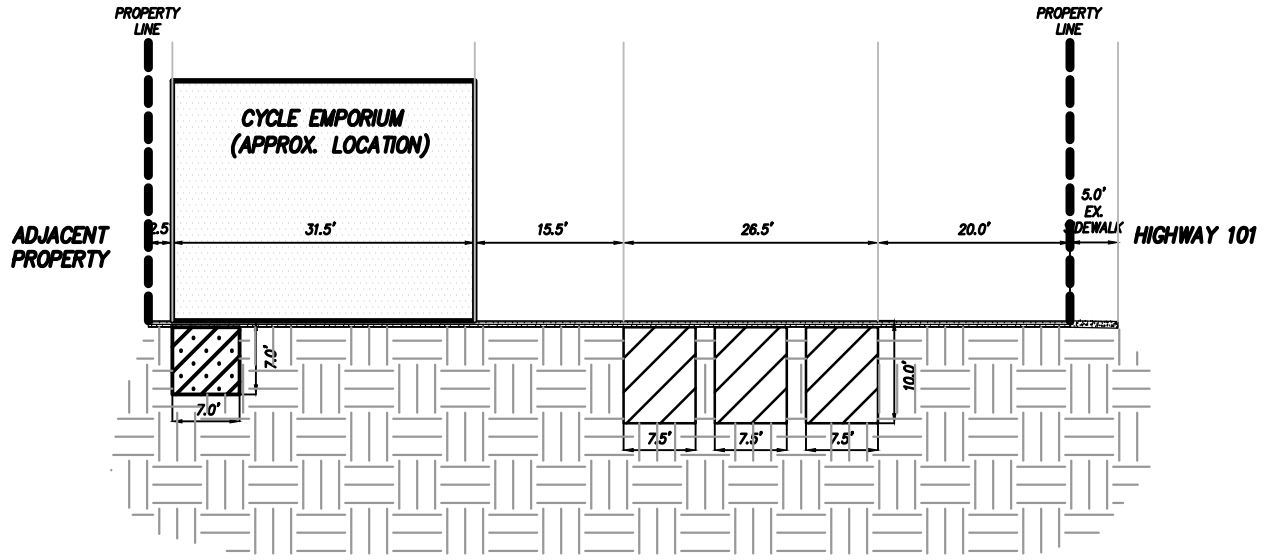
DAHLIA ROAD

APPLIED HYDROGEOLOGIC consultants
3052 C/Jerome Drive, Suite H-10 • San Diego, CA 92117 • (619) 275 6577

Figure 1
Site Plan
Ullman Shell
343 South Highway 101

Project No.
AHC 29C5.7

**SOLANA 101 PROJECT
EXISTING FUEL/OIL STORAGE TANK EXHIBIT**



SECTION: EXISTING WASTE FUEL/OIL STORAGE TANKS
(NOT TO SCALE)



ATTACHMENT B
ANALYTE LISTS

➤ Table 3-3 Analytes, Methods, and Detection Limits for Physical and Chemical Testing.

GROUPINGS	Attributes	Analytical Method	MDLs ¹	TRLs ²	MDL ³	TRL ⁴	Units
Conventionals	Grain Size	Plumb (1981)	NA	NA			%
	Ammonia	350.1M	0.04	0.5			mg/kg
	TOC	USEPA 9060A	0.07	0.2			%
	Moisture	160.3	NA	NA			%
	TSS	SM 2540 D	5	5			mg/L
	TVS	SM 2540E	NA	NA			%
	TPH	SW-846	NA	NA			mg/kg
	TRPH	1664M	1.6	25			mg/kg
Metals	Arsenic	USEPA 6020	0.051	1.0	0.051	1.0	mg/kg
	Cadmium	USEPA 6020	0.005	0.5	0.005	0.5	mg/kg
	Chromium	USEPA 6020	0.017	2.0	0.017	2.0	mg/kg
	Copper	USEPA 6020	0.018	3.0	0.018	3.0	mg/kg
	Lead	USEPA 6020	0.009	3.0	0.009	3.0	mg/kg

¹ Method Detection Limit (dry weight) for sediment

² Target Reporting Limit (dry weight) for sediment

³ Method Detection Limit (dry weight) for tissue

⁴ Target Reporting Limit (dry weight) for tissue

	Mercury	USEPA 7471A	0.001	0.5	0.001	0.5	mg/kg	
	Nickel	USEPA 6020	0.016	5.0	0.016	5.0	mg/kg	
	Selenium	USEPA 6020	0.035	0.1	0.035	0.1	mg/kg	
	Silver	USEPA 6020	0.004	0.2	0.004	0.2	mg/kg	
	Zinc	USEPA 6020	0.26	3.0	0.26	3.0	mg/kg	
Organotins	Dibutyltin	Krone 1989	0.18	1.0	0.18	1.0	µg/kg	
	Monobutyltin	Krone 1989	0.3	1.0	0.3	1.0	µg/kg	
	Tetrabutyltin	Krone 1989	0.36	1.0	0.36	1.0	µg/kg	
	Tributyltin	Krone 1989	0.33	1.0	0.33	1.0	µg/kg	
PAHs	1-Methylnaphthalene	EPA 8270C SIM	0.5	20.0			µg/kg	
	2-Methylnaphthalene	EPA 8270C SIM	0.5	20.0			µg/kg	
	Acenaphthene	EPA 8270C SIM	0.76	20.0	0.76	20.0	µg/kg	
	Acenaphthylene	EPA 8270C SIM	0.73	20.0	0.73	20.0	µg/kg	
	Anthracene	EPA 8270C SIM	0.66	20.0	0.66	20.0	µg/kg	
	Benzo(a)anthracene	EPA 8270C SIM	1.01	20.0	1.01	20.0	µg/kg	
	Benzo(a)pyrene	EPA 8270C SIM	0.64	20.0	0.64	20.0	µg/kg	
	Benzo (b) Fluoranthene	EPA 8270C SIM	0.77	20.0	0.77	20.0	µg/kg	
	Benzo (g,h,i) Perylene	EPA 8270C SIM	1.14	20.0	1.14	20.0	µg/kg	
	Benzo (k) Fluoranthene	EPA 8270C SIM	0.96	20.0	0.96	20.0	µg/kg	
	Chrysene	EPA 8270C SIM	0.76	20.0	0.76	20.0	µg/kg	
	Dibenz (a,h) Anthracene	EPA 8270C SIM	0.53	20.0	0.53	20.0	µg/kg	
	Fluoranthene	EPA 8270C SIM	0.78	20.0	0.78	20.0	µg/kg	
	Fluorene	EPA 8270C SIM	0.7	20.0	0.7	20.0	µg/kg	
	Indeno (1,2,3-c,d) Pyrene	EPA 8270C SIM	0.66	20.0	0.66	20.0	µg/kg	
	Naphthalene	EPA 8270C SIM	0.5	20.0	0.5	20.0	µg/kg	
		Phenanthrene	EPA 8270C SIM	1.08	20.0	1.08	20.0	µg/kg
		Pyrene	EPA 8270C SIM	0.82	20.0	0.82	20.0	µg/kg
		Total PAHs	EPA 8270C SIM					µg/kg
		PCB 018	USEPA 8082A ECD	0.086	0.50	0.086	0.50	µg/kg
		PCB 028	USEPA 8082A ECD	0.53	0.50	0.53	0.50	µg/kg
		PCB 037	USEPA 8082A ECD	0.12	0.50	0.12	0.50	µg/kg
	PCB 044	USEPA 8082A ECD	0.25	0.50	0.25	0.50	µg/kg	
	PCB 049	USEPA 8082A ECD	0.095	0.50	0.095	0.50	µg/kg	
	PCB 052	USEPA 8082A ECD	0.15	0.50	0.15	0.50	µg/kg	
	PCB 066	USEPA 8082A ECD	0.1	0.50	0.1	0.50	µg/kg	
PCBs	PCB 070	USEPA 8082A ECD	0.15	0.50	0.15	0.50	µg/kg	
	PCB 074	USEPA 8082A ECD	0.1	0.50	0.1	0.50	µg/kg	
	PCB 077	USEPA 8082A ECD	0.082	0.50	0.082	0.50	µg/kg	
	PCB 081	USEPA 8082A ECD	0.07	0.50	0.07	0.50	µg/kg	
	PCB 087	USEPA 8082A ECD	0.15	0.50	0.15	0.50	µg/kg	
	PCB 099	USEPA 8082A ECD	0.079	0.50	0.079	0.50	µg/kg	
	PCB 101	USEPA 8082A ECD	0.078	0.50	0.078	0.50	µg/kg	
	PCB 105	USEPA 8082A ECD	0.053	0.50	0.053	0.50	µg/kg	
	PCB 110	USEPA 8082A ECD	0.082	0.50	0.082	0.50	µg/kg	

PCB 114	USEPA 8082A ECD	0.068	0.50	0.068	0.50	µg/kg
PCB 118	USEPA 8082A ECD	0.078	0.50	0.078	0.50	µg/kg
PCB 119	USEPA 8082A ECD	0.072	0.50	0.072	0.50	µg/kg
PCB 123	USEPA 8082A ECD	0.092	0.50	0.092	0.50	µg/kg
PCB 126	USEPA 8082A ECD	0.072	0.50	0.072	0.50	µg/kg
PCB 128	USEPA 8082A ECD	0.08	0.50	0.08	0.50	µg/kg
PCB 138	USEPA 8082A ECD	0.075	0.50	0.075	0.50	µg/kg
PCB 149	USEPA 8082A ECD	0.07	0.50	0.07	0.50	µg/kg
PCB 151	USEPA 8082A ECD	0.069	0.50	0.069	0.50	µg/kg
PCB 153	USEPA 8082A ECD	0.097	0.50	0.097	0.50	µg/kg
PCB 156	USEPA 8082A ECD	0.073	0.50	0.073	0.50	µg/kg
PCB 157	USEPA 8082A ECD	0.076	0.50	0.076	0.50	µg/kg
PCB 158	USEPA 8082A ECD	0.07	0.50	0.07	0.50	µg/kg
PCB 167	USEPA 8082A ECD	0.088	0.50	0.088	0.50	µg/kg
PCB 168	USEPA 8082A ECD	0.069	0.50	0.069	0.50	µg/kg
PCB 169	USEPA 8082A ECD	0.093	0.50	0.093	0.50	µg/kg
PCB 170	USEPA 8082A ECD	0.066	0.50	0.066	0.50	µg/kg
PCB 177	USEPA 8082A ECD	0.089	0.50	0.089	0.50	µg/kg
PCB 180	USEPA 8082A ECD	0.083	0.50	0.083	0.50	µg/kg
PCB 183	USEPA 8082A ECD	0.064	0.50	0.064	0.50	µg/kg
PCB 187	USEPA 8082A ECD	0.087	0.50	0.087	0.50	µg/kg
PCB 189	USEPA 8082A ECD	0.068	0.50	0.068	0.50	µg/kg
PCB 194	USEPA 8082A ECD	0.082	0.50	0.082	0.50	µg/kg
PCB 201	USEPA 8082A ECD	0.13	0.50	0.13	0.50	µg/kg
PCB 206	USEPA 8082A ECD	0.078	0.50	0.078	0.50	µg/kg
PCBs	USEPA 8082A ECD					µg/kg
2,4'-DDD	US EPA 8081A	0.2	2	0.2	2	µg/kg
2,4'-DDE	US EPA 8081A	0.18	2	0.18	2	µg/kg
2,4'-DDT	US EPA 8081A	0.14	2	0.14	2	µg/kg
4,4'-DDD	US EPA 8081A	0.26	2	0.26	2	µg/kg
4,4'-DDE	US EPA 8081A	0.3	2	0.3	2	µg/kg
4,4'-DDT	US EPA 8081A	0.33	2	0.33	2	µg/kg
DDTs	US EPA 8081A					µg/kg
Pesticides						
Aldrin	US EPA 8081A	0.31	2	0.31	2	µg/kg
Alpha-BHC	US EPA 8081A	0.29	2	0.29	2	µg/kg
Beta-BHC	US EPA 8081A	0.26	2	0.26	2	µg/kg
Chlordane	US EPA 8081A	1.9	10	1.9	10	µg/kg
Delta-BHC	US EPA 8081A	0.32	2	0.32	2	µg/kg
Dieldrin	US EPA 8081A	0.23	2	0.23	2	µg/kg
Endosulfan I	US EPA 8081A	0.36	2	0.36	2	µg/kg
Endosulfan II	US EPA 8081A	0.18	2	0.18	2	µg/kg
Endosulfan Sulfate	US EPA 8081A	0.26	2	0.26	2	µg/kg
Endrin	US EPA 8081A	0.2	2	0.2	2	µg/kg
Endrin Aldehyde	US EPA 8081A	0.2	2	0.2	2	µg/kg
Endrin Ketone	US EPA 8081A	0.3	2	0.3	2	µg/kg

	Gamma-BHC	US EPA 8081A	0.23	2	0.23	2	µg/kg
	Heptachlor	US EPA 8081A	0.22	2	0.22	2	µg/kg
	Heptachlor Epoxide	US EPA 8081A	0.18	2	0.18	2	µg/kg
	Methoxychlor	US EPA 8081A	0.17	2	0.17	2	µg/kg
	Toxaphene	US EPA 8081A	8.5	10	8.5	10	µg/kg
	Bis(2-Ethylhexyl) Phthalate	EPA 8270C SIM	4.1	20	4.1	20	µg/kg
	Butylbenzyl Phthalate	EPA 8270C SIM	4.4	20	4.4	20	µg/kg
	Diethyl Phthalate	EPA 8270C SIM	5	20	5	20	µg/kg
	Dimethyl Phthalate	EPA 8270C SIM	5.4	20	5.4	20	µg/kg
	Di-n-butyl Phthalate	EPA 8270C SIM	5.1	20	5.1	20	µg/kg
	Di-n-octyl Phthalate	EPA 8270C SIM	4.7	20	4.7	20	µg/kg
Phthalates							
	Allethrin (Bioallethrin)	GC/MS/MS	0.09	1	0.09	1	µg/kg
	Bifenthrin	GC/MS/MS	0.085	1	0.085	1	µg/kg
	Cyfluthrin-beta (Baythroid)	GC/MS/MS	0.1	1	0.1	1	µg/kg
	Cyhalothrin-Lamba	GC/MS/MS	0.078	1	0.078	1	µg/kg
	Cypermethrin	GC/MS/MS	0.15	1	0.15	1	µg/kg
	Deltamethrin (Decamethrin)	GC/MS/MS	0.093	1	0.093	1	µg/kg
	Esfenvalerate	GC/MS/MS	0.087	1	0.087	1	µg/kg
Pyrethroids	Fenpropathrin (Danitol)	GC/MS/MS	0.091	1	0.091	1	µg/kg
	Fenvalerate (sanmarton)	GC/MS/MS	0.094	1	0.094	1	µg/kg
	Fluvalinate	GC/MS/MS	0.12	1	0.12	1	µg/kg
	Permethrin (cis and trans)	GC/MS/MS	0.088	1	0.088	1	µg/kg
	Resmethrin (Bioresmethrin)	GC/MS/MS	0.079	1	0.079	1	µg/kg
	Resmethrin	GC/MS/MS	0.013	1	0.013	1	µg/kg
	Sumithrin (Phenothrin)	GC/MS/MS	0.09	1	0.09	1	µg/kg
	Tetramethrin	GC/MS/MS	0.085	1	0.085	1	µg/kg
	Tralomethrin	GC/MS/MS	0.1	1			µg/kg



Sampling and Analysis Plan Results Report

Solana 101 Mixed-Use Project
329 and 343 South Highway 101 and 112-114, 120, and 128 Dahlia Drive
Solana Beach, California

AEC Project No. 19-228SD
August 17, 2019

Prepared For:

Zephyr Partners
700 Second Street
Encinitas, California 92024

Presented To:

U.S. Army Corps of Engineers
San Diego Field Office
6010 Hidden Valley Road, Suite 105
Carlsbad, CA 92011-4213
Attn: Robert Smith

Prepared By:

Advantage Environmental Consultants, LLC
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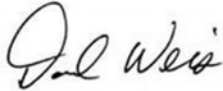
Sampling and Analysis Plan Results Report

Solana 101 Mixed-Use Project 329 and 343 South Highway 101 and 112-114, 120, and 128 Dahlia Drive Solana Beach, California

On behalf of Zephyr Partners, Advantage Environmental Consultants, LLC has prepared this Sampling and Analysis Plan Results Report (SAPR) for the above referenced property. This SAPR is being submitted to the United States Army Corps of Engineers and United States Environmental Protection Agency (Region 9) for review and approval and was completed in accordance with the standards of care exercised by environmental and geoscience professionals in the industry.

PROJECT MANAGER CERTIFICATION

I certify that the information contained in or included with this submittal is accurate and complete. This submittal and all attachments were prepared at my direction and in accordance with protocols designed to assure that qualified personnel gathered and evaluated the information submitted in accordance with the standards of care exercised by environmental and geoscience professionals in the industry.



Daniel Weis, R.E.H.S.
Branch Manager

WORK PROGRAM CERTIFICATION

This report presents the technical approach of AEC to investigate soil conditions at the above referenced property. This report has been completed in accordance with the standards of care exercised by environmental and geoscience professionals in the industry.



Eric Cathcart, MS, PG
California Professional Geologist #7548
Senior Geologist



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1.3	Previous Site Assessment Work and Regulatory Status.....	1
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FIGURES

FIGURES 1A-1C	VICINITY MAPS
FIGURE 2	TOPOGRAPHIC MAP
FIGURE 3	AERIAL PHOTOGRAPH
FIGURE 4	FLETCHER COVE DISCHARGE LOCATION

TABLE

TABLE 1	CHEMICAL ANALYTICAL RESULTS
---------	-----------------------------

APPENDICES

APPENDIX A	SOIL BORING LOGS
APPENDIX B	GEOTECHNICAL DATA
APPENDIX C	ANALYTICAL LABORATORY REPORTS

1.0 INTRODUCTION

On behalf of Zephyr Partners, Advantage Environmental Consultants, LLC (AEC) has prepared this Sampling and Analysis Plan Results Report (SAPR) pertaining to the Solana 101 Mixed-Use Project property in the City of Solana Beach, County of San Diego, California (Site). This SAPR is being submitted to the United States Army Corps of Engineers and United States Environmental Protection Agency (EPA) (Region 9) for review and approval and was prepared in general accordance with United States Army Corps of Engineers Los Angeles District and United States EPA Region 9 Draft Sampling and Analysis Plan Guidelines dated February 2015. By way of the publication of this SAPR, Zephyr is evaluating the feasibility of discharging some soils to be exported during future Site grading activities to the Pacific Ocean shoreline at Fletcher Cove Beach. Fletcher Cove Beach has an established Sand Compatibility Opportunistic Use Program (SCOUP) which allows for the streamlined approval of compatible upland materials for beach nourishment. Any Site soils that are not discharged to Fletcher Cove Beach (assuming discharge is approved) will be exported to one or more upland receiving locations during the planned construction activities. The work described herein was completed under the approved Sampling and Analysis Plan (SAP) for the project dated July 3, 2019.

1.1 Site Location and Description

The 1.9-acre Site is located at 329 and 343 South Highway 101 and 112-114, 120, and 128 Dahlia Drive in the City of Solana Beach, California and is further identified by County of San Diego Assessor's Parcel Numbers 298-052-06, -07, -08, -13, and -14. The Site is currently developed with three one-story commercial buildings, a one-story residence, and multiple former mobile home parking pads and associated outbuildings and is situated generally north of Dahlia Drive, to the west of South Highway 101 and to the east by South Sierra Avenue. The Site is slated for new mixed-use development which will include demolition of existing improvements, mass grading operations and construction of new buildings over a two-level underground parking garage. Per the project grading plan, a reported 74,000 cubic yards of soil is planned to be exported from the Site during development activities. Maximum cuts are on the order of 25 feet below existing grades. There are no dredging related operations required during the planned Site development or potentially sensitive habitat related constraints associated with the planned development activities.

Current Site topography is gently sloping with an elevation ranging from approximately 60 feet above mean sea level to 70 feet above mean sea level. Site drainage is in a westerly direction. The latitude and longitude (decimal coordinates) of the approximate geographic center of the Site is (32.987702, -117.271442). The general location of the Site is depicted on the Vicinity Maps included as Figures 1a through 1c. A reproduction of a USGS topographic map of the Site is included as Figure 2. An aerial photograph-based Site Plan is included as Figure 3.

1.2 Site History

The existing commercial and residential Site buildings were constructed in the early 1950s. The southeast corner of the Site formerly operated as a gasoline station in the 1960s and 1970s. Prior to the use of the Site for commercial and residential purposes, the Site was vacant land or used for agricultural purposes. The Site is connected to the City maintained sanitary sewer system, including areas of the former mobile home pads. Adjacent properties have also been historically used for agricultural, commercial and residential purposes.

1.3 Previous Site Assessment Work and Regulatory Status

Two prior Phase I Environmental Site Assessments (ESAs) and a Phase II ESA of the Site have been completed by others. Prior geotechnical investigations have also been conducted at the Site that included but were not limited to lithologic descriptions, gradation testing and the development of grain size distribution curves. There were no current recognized environmental conditions in connection with the Site identified during the completion of the ESAs at the time they were completed. However, a former gasoline station at the southeast corner of the Site was identified as a historical recognized

environmental condition in connection with the Site. During the decommissioning of the fueling systems associated with the station in 1988, four underground storage tanks (USTs) ranging in capacity from 500 gallons to 12,000 gallons were removed. No impacts of significance were reportedly identified in the area of three former gasoline USTs. However, impacted soil was encountered in the area of a former waste oil UST and additional assessment was required by the County of San Diego Department of Environmental Health (DEH). Following the additional assessment work that was conducted to delineate the extent of impact in the UST area, remedial excavation was conducted and any remaining impacted soil was reportedly removed. The DEH subsequently issued a no further action letter for the Site. The Site Plan included as Figure 3 depicts the locations of the former USTs and dispenser islands.

There have been no other known previous subsurface environmental assessments completed at the Site. In addition, the Site is not listed on any environmental regulatory databases in connection with current hazardous waste generation, hazardous materials use and/or unauthorized releases of hazardous substances and/or petroleum products.

There are no planned environmental remedial excavation activities planned for the Site at this time as no impacted soil is anticipated to be encountered in this area during mass grading activities. In addition, there have also been no known prior environmental remediation activities conducted at the potential Fletcher Cove receiving location. It should be known that there are numerous conventional storm drain inlets associated with the municipal stormwater conveyance system maintained by the City of Solana Beach that lead to Fletcher Cove and the Pacific Ocean. However, there is reportedly no active 303(d) listing or Total Maximum Daily Load development or monitoring requirements for the proposed Fletcher Cove receiving location and associated nearshore waters of the Pacific Ocean.

1.4 Project Objective

The primary objective of this SAPR is to present the results of the sampling and analysis proposed in the SAP which discuss the physical and chemical compatibility of soil at the Site relative to the proposed export and reuse of Site soils to the Pacific Ocean shoreline at Fletcher Cove Beach for beach nourishment purposes. The location of the Fletcher Cove Beach receiving location is depicted on Figure 4 of this SAP. Relative to a final evaluation of geotechnical compatibility of Site soils relative to the potential discharge at Fletcher Cove, grain envelope size information for the Fletcher Cove location from 2013 has been provided by the City of Solana Beach. The City has directed the developer and its consultants to utilize the 2013 data for the purposes of decision making relative to geotechnical suitability of on-Site soils.

The project team consists of Zephyr Partners as project proponent/applicant the City of Solana Beach as local governmental agency, AEC as environmental consultant and Nova as geotechnical consultant. The authorized representative for field activities and consultant project manager was Dan Weis of AEC. Environmental testing of Site soils was conducted by American Environmental Testing Laboratory (AETL) of Burbank, California and Torrent Laboratory, Inc. (Torrent) of Milpitas, California. AETL and Torrent are certified through the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP). The ELAP certificate numbers for AETL and Torrent are #1541 and #1991, respectively. Geotechnical testing of Site soils was completed by Nova at their in-house laboratory. AEC and Nova collaborated on the project relative to data collection/analysis and results.

2.0 GEOLOGICAL AND HYDROGEOLOGICAL SETTING

The Site lies within the Peninsular Ranges Geologic Province of California. This geomorphic province is traversed by a group of northwest trending sub-parallel fault zones and encompasses an area that extends 125 miles from the Transverse Ranges and the Los Angeles Basin south to the Mexican Border and beyond another 775 miles to the tip of Baja California. Rocks within the Peninsular Range Province were emplaced during Cretaceous age orogenic events and uplifted into the present mountain ranges during the late Tertiary and Quaternary. Igneous, metamorphic and sedimentary rocks are all found within the Peninsular Ranges. The area is seismically active, with several known active faults crossing the Province.

The Site sits atop a coastal terrace, approximately 1,000 feet east of a coastal bluff which drops toward the beach and ocean. The Site is underlain by Pleistocene-aged Old Paralic Deposits. The Paralic deposits consist of strandline, beach, estuarine and colluvial siltstones, sandstones and conglomerates. As encountered at the Site during prior geotechnical studies, the Paralics consist of light brown to reddish brown, damp to moist, weakly to moderately cemented, weathered, friable, silty sandstone. As is typical of many urbanized sites, the Paralics are overlain by a veneer of artificial fill material which appears to be relatively shallow. The Old Paralic deposits occur widely, found from the International Border to northern Carlsbad and comprising the dominant near-surface geologic formation in much of San Diego. It is the paralic deposits that provide relatively higher-quality foundation support for civil development in San Diego. The unit ranges to 65 feet in thickness but is generally less than 50 feet in thickness.

According to the Water Quality Control Plan for the San Diego Basin, the Site is situated within the Rancho Santa Fe Hydrologic Sub-area of the Solana Beach Hydrologic Area of the San Dieguito Hydrologic Unit. Groundwater in the Solana Beach Hydrologic Area has municipal, agricultural and industrial supply use designations. The depth to groundwater in the area is anticipated to be greater than 50 feet below ground surface. The anticipated groundwater flow direction is towards the Pacific Ocean to the west in accordance with surface topography. Surface runoff at the Site and along adjacent roadways is expected to occur as sheet flow. Surface drainage at the Site is facilitated by nearby municipal storm drains along public roadways which are maintained by the City of Solana Beach. The Site does not appear to receive significant drainage from off-Site properties.

3.0 METHODS

3.1 Preliminary Field Activities

The following tasks were performed before the commencement of field sampling activities:

- Field representatives completed Site visits to confirm/mark-out the locations of proposed sampling locations.
- All equipment used during the sampling events was inspected, pre-cleaned and decontaminated.
- All forms used in the field (i.e., logbook, chain-of-custody forms, etc.) were assembled.
- Sampling personnel reviewed the sampling protocols. In addition, health and safety protocols were reviewed.
- Dig Alert notifications were conducted in accordance with State law and private utility locating methods were utilized as-needed.

3.2 Sampling Methodology

Eight exploratory borings were advanced at the Site on July 16, 2019 to collect samples for the purposes of making a determination of suitability of soil for export to Fletcher Cove receiving location. The borings were drilled in planned cut areas to depths of 20 feet below existing grades by a C-57 licensed drilling contractor (Astech Environmental) retained by AEC. The borings were identified as B1 through B8. The approximate latitude and longitude (decimal coordinates) and elevation (feet above mean sea level (msl)) of each boring location are presented in the table below.

Boring ID	Latitude	Longitude	Approximate Ground Surface Elevation (feet above msl)
B1	32.987623	-117.271237	+68
B2	32.987626	-117.271040	+67
B3	32.987537	-117.271013	+67
B4	32.987478	-117.271593	+66
B5	32.987657	-117.271845	+62
B6	32.987832	-117.271589	+67
B7	32.987935	-117.271322	+69
B8	32.987776	-117.271202	+69

The borings were drilled using a truck-mounted direct-push sampling rig equipped with approximate two-inch diameter stainless steel rods and soil sampling tools. Soil samples were collected using stainless steel sampling rods lined with acetate sleeves. Soil samples were collected at five vertical foot increments in the borings. The acetate sleeves were cut, sealed with Parafilm® sheets, capped, appropriately labeled and placed into a chilled cooler (environmental samples only) for transport to the appropriate laboratories. A total of 40 soil samples were obtained during the drilling activities.

Chain-of-custody documentation was provided for each environmental soil sample transferred to the laboratory. A log of each soil boring was prepared in accordance with the USCS. QA/QC procedures used during soil sampling included using drill rods that were cleaned prior to use and cleansing the sampling equipment in a non-phosphate detergent followed by successive rinses in drinking water. No conditions of potential concern (i.e. staining, odors, presence or deleterious material) were identified during sampling procedures.

3.3 Laboratory Analysis

A total of 40 soil samples (five from each soil boring) were collected during the sampling activities at depths above 1, 5, 10, 15 and 20 feet at each location. With the exception of the soil sample obtained from the 20 foot depth of boring B6, all soil samples obtained during the drilling activities were subject to gradation analysis (ASTM D6913) completed by Nova. The sample in question (B6-20) was inadvertently omitted from the samples delivered to Nova by AEC. However, based on the results of the geotechnical analysis described in Section 4.1, the lack of analysis of this single soil sample does not alter the conclusions and recommendations of this report.

For environmental testing purposes, in soil borings B1, B2 and B3 (in the former gasoline station area), the analytical laboratory was instructed to composite equal portions of the 15 discrete soil samples obtained from these borings. The resultant composite soil sample was identified as COMP B1, B2, B3. In soil borings B4, B5, B6, B7 and B8, the analytical laboratory was also instructed to composite equal portions of the discrete samples obtained (25 total samples). The resultant composite soil sample was identified as COMP B4, B5, B6, B7, B8. The two composite soil samples were analyzed for the following list of analytes (full Inland Testing Manual (ITM) list):

ITM Analyte List

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³
Conventionals	Ammonia	mg/kg			
	Total Organic Carbon	mg/kg			
	Moisture	%			
	Volatile Solids	%			
	Total Recoverable Petroleum Hydrocarbons	mg/kg			
	Oil and Grease	mg/kg			
	Total Sulfide	mg/kg			
	Total Solids	%			
Metals	Arsenic	mg/kg	8.2	70	4.5
	Cadmium	mg/kg			
	Chromium	mg/kg	81	370	
	Copper	mg/kg	34	270	
	Lead	mg/kg	46.7	218	
	Mercury	mg/kg			
	Nickel	mg/kg	20.9	51.6	
	Selenium	mg/kg			
	Silver	mg/kg	1	3.7	
	Zinc	mg/kg	150	410	
Organotins	Dibutyltin	microg/kg			
	Monobutyltin	microg/kg			
	Tetrabutyltin	microg/kg			
	Tributyltin	microg/kg			
Semi-Volatile Organic Compounds (SVOCs) - PAHs	1-Methylnaphthalene	microg/kg			
	2-Methylnaphthalene	microg/kg			

¹ NOAA Effects Range Low

² NOAA Effects Range Medium

³ EPA Regional Screening Level for dermal exposure cancer risk

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³
	2,4,5-Trichlorophenol	microg/kg			
	2,4,6-Trichlorophenol	microg/kg			180000
	2,4-Dichlorophenol	microg/kg			
	2,4-Dimethylphenol	microg/kg			
	2,4-Dinitrophenol	microg/kg			
	2-Chlorophenol	microg/kg			
	2-Methylnaphthalene	microg/kg			
	Acenaphthene	microg/kg	16	500	
	Acenaphthylene	microg/kg	44	640	
	Anthracene	microg/kg	85.8	1100	
	Benzo(a)anthracene	microg/kg	261	1600	530
	Benzo(a)pyrene	microg/kg	430	1600	53
	Benzo (b) Fluoranthene	microg/kg			530
	Benzo (g,h,i) Perylene	microg/kg			
	Benzo (k) Fluoranthene	microg/kg			
	Chrysene	microg/kg	384	2800	53000
	Dibenz (a,h) Anthracene	microg/kg	63.4	260	53
	Fluoranthene	microg/kg	600	5100	
	Fluorene	microg/kg	19	540	
	Indeno (1,2,3-c,d) Pyrene	microg/kg			530
	Naphthalene	microg/kg	160	2100	
	N-Nitrosodimethylamine	microg/kg			
	Pentachlorophenol	microg/kg			
	Phenanthrene	microg/kg	240	1500	
	Pyrene	microg/kg	665	2600	
	Total PAHs	microg/kg	4022	44792	
PCB Congeners	PCB 018	microg/kg			
	PCB 028	microg/kg			
	PCB 037	microg/kg			
	PCB 044	microg/kg			
	PCB 049	microg/kg			
	PCB 052	microg/kg			
	PCB 066	microg/kg			
	PCB 070	microg/kg			
	PCB 074	microg/kg			
	PCB 077	microg/kg			110
	PCB 081	microg/kg			110
	PCB 087	microg/kg			
	PCB 099	microg/kg			
	PCB 101	microg/kg			
	PCB 105	microg/kg			110
	PCB 110	microg/kg			
	PCB 114	microg/kg			2.2
PCB 118	microg/kg			110	
PCB 119	microg/kg				
PCB 123	microg/kg			110	

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³
	PCB 126	microg/kg			0.11
	PCB 128	microg/kg			
	PCB 138	microg/kg			
	PCB 149	microg/kg			
	PCB 151	microg/kg			
	PCB 153	microg/kg			
	PCB 156	microg/kg			22
	PCB 157	microg/kg			22
	PCB 158	microg/kg			
	PCB 167	microg/kg			1100
	PCB 168	microg/kg			
	PCB 169	microg/kg			1.1
	PCB 170	microg/kg			
	PCB 177	microg/kg			
	PCB 180	microg/kg			
	PCB 183	microg/kg			
	PCB 187	microg/kg			
	PCB 189	microg/kg			110
	PCB 194	microg/kg			
	PCB 201	microg/kg			
	PCB 206	microg/kg			
	Total PCBs	microg/kg	22.7	180	
Organochlorine Pesticides	2,4'-DDD	microg/kg			
	2,4'-DDE	microg/kg			
	2,4'-DDT	microg/kg			
	4,4'-DDD	microg/kg	2	20	8400
	4,4'-DDE	microg/kg	2.2	27	6000
	4,4'-DDT	microg/kg	1	7	20000
	DDTs	microg/kg	1.58	46.1	
	Aldrin	microg/kg			
	Alpha-BHC	microg/kg			
	Beta-BHC	microg/kg			
	Chlordane	microg/kg	0.5	6	14000
	Delta-BHC	microg/kg			
	Dieldrin	microg/kg	0.02	8	130
	Endosulfan I	microg/kg			
	Endosulfan II	microg/kg			
	Endosulfan Sulfate	microg/kg			
	Endrin	microg/kg			
	Endrin Aldehyde	microg/kg			
	Endrin Ketone	microg/kg			
	Gamma-BHC	microg/kg			
	Heptachlor	microg/kg			
	Heptachlor Epoxide	microg/kg			220
	Methoxychlor	microg/kg			
	Toxaphene	microg/kg			1800

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³
SVOCs - Phthalates	Bis(2-Ethylhexyl) Phthalate	microg/kg			
	Butylbenzyl Phthalate	microg/kg			
	Diethyl Phthalate	microg/kg			
	Dimethyl Phthalate	microg/kg			
	Di-n-butyl Phthalate	microg/kg			
	Di-n-octyl Phthalate	microg/kg			
SVOCs - Phenols	2-Methylphenol	microg/kg			
	2-Nitrophenol	microg/kg			
	3,4-Methylphenol	microg/kg			
	4,6-Dinitro-2-Methylphenol	microg/kg			
	4-Chloro-3-Methylphenol	microg/kg			
	Bisphenol A	microg/kg			
	Total phenols	microg/kg			
Pesticides - Pyrethroids	Allethrin (Bioallethrin)	microg/kg			
	Bifenthrin	microg/kg			
	Cyfluthrin-beta (Baythroid)	microg/kg			
	Cyhalothrin-Lamba	microg/kg			
	Cypermethrin	microg/kg			
	Deltamethrin (Decamethrin)	microg/kg			
	Esfenvalerate	microg/kg			
	Fenpropathrin (Danitol)	microg/kg			
	Fenvalerate (sanmarton)	microg/kg			
	Fluvalinate	microg/kg			
	Permethrin (cis and trans)	microg/kg			
	Resmethrin (Bioresmethrin)	microg/kg			
	Resmethrin	microg/kg			
	Sumithrin (Phenothrin)	microg/kg			
	Tetramethrin	microg/kg			
Tralomethrin	microg/kg				
Volatile Organic Compounds (VOCs)	1,1,1,2-Tetrachloroethane	microg/kg			
	1,1,1-Trichloroethane	microg/kg			
	1,1,2,2-Tetrachloroethane	microg/kg			
	1,1,2-Trichloroethane	microg/kg			
	1,1-Dichloroethane	microg/kg			
	1,1-Dichloroethene	microg/kg			
	1,1-Dichloropropene	microg/kg			
	1,2,3-Trichlorobenzene	microg/kg			
	1,2,3-Trichloropropane	microg/kg			
	1,2,4-Trichlorobenzene	microg/kg			
	1,2,4-Trimethylbenzene	microg/kg			
	1,2-Dibromo-3-Chloropropane	microg/kg			
	1,2-Dibromoethane	microg/kg			
	1,2-Dichlorobenzene	microg/kg			
	1,2-Dichloroethane	microg/kg			
	1,2-Dichloropropane	microg/kg			

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³
	1,3,5-Trimethylbenzene	microg/kg			
	1,3-Dichlorobenzene	microg/kg			
	1,3-Dichloropropane	microg/kg			
	1,4-Dichlorobenzene	microg/kg			
	2,2-Dichloropropane	microg/kg			
	2-Butanone (Methylethyl ketone [MEK])	microg/kg			
	2-Chloroethyl Vinyl ether	microg/kg			
	2-Chlorotoluene	microg/kg			
	2-Hexanone	microg/kg			
	4-Chlorotoluene	microg/kg			
	4-Methyl-2-Pentanone	microg/kg			
	Acetone	microg/kg			
	Benzene	microg/kg			
	Bromobenzene	microg/kg			
	Bromochloromethane	microg/kg			
	Bromodichloromethane	microg/kg			
	Bromoform	microg/kg			
	Bromomethane	microg/kg			
	Carbon Disulfide	microg/kg			
	Carbon Tetrachloride	microg/kg			
	Chlorobenzene	microg/kg			
	Chloroethane	microg/kg			
	Chloroform	microg/kg			
	Chloromethane	microg/kg			
	cis-1,2-Dichloroethene	microg/kg			
	cis-1,3-Dichloropropene	microg/kg			
	Dibromochloromethane	microg/kg			
	Dibromomethane	microg/kg			
	Dichlorodifluoromethane	microg/kg			
	Ethylbenzene	microg/kg			
	Hexachlorobutadiene	microg/kg			
	Isopropylbenzene	microg/kg			
	Methylene Chloride	microg/kg			
	MTBE	microg/kg			
	n-Butylbenzene	microg/kg			
	n- Propylbenzene	microg/kg			
	Naphthalene	microg/kg			
	p- Isopropyltoluene	microg/kg			
	sec-Butylbenzene	microg/kg			
	Styrene	microg/kg			
	tert-Butylbenzene	microg/kg			
	Tetrachloroethene	microg/kg			
	Toluene	microg/kg			
	trans-1,2-Dichloroethene	microg/kg			
	trans-1,3-Dichloropropene	microg/kg			
	Trichloroethene	microg/kg			

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³
	Trichlorofluoromethane	microg/kg			
	Vinyl Acetate	microg/kg			
	Vinyl Chloride	microg/kg			
	o-xylene	microg/kg			
	m,p-xylenes	microg/kg			
Total Petroleum Hydrocarbons (TPH)	TPH as Gasoline and Light Hydrocarbons	mg/kg			
	TPH as Diesel and Heavy Hydrocarbons	mg/kg			
Dioxins and Furans	All Dioxins and Furans (See Squirts Quick Reference Tables)	pg/g			

3.4 Laboratory Detection Limits

Environmental laboratory method detection and reporting limits were sufficient for the evaluation of such soil being reused at Fletcher Cove Beach in Solana Beach for beach nourishment purposes.

3.5 Sample Collection Procedures

3.5.1 Sample Containers, Labels and Preservation

As stated previously, soil samples obtained during the field sampling were collected into acetate sleeves, and sample labels were firmly attached to the containers. The following information was printed on the label:

- Project name and number
- Sample location and analytical parameters
- Boring identification number
- Sample identification number
- Sample collector's initials
- Date and time of collection

Preservatives were not required for the soil samples. However, soil samples were properly prepared for transportation to the environmental analytical laboratory by placing the samples in coolers containing ice to maintain adequate shipping temperature.

3.5.2 Sample Packaging and Shipment

Once environmental soil samples were obtained, they were immediately placed in the cooler on ice to maintain adequate shipping temperatures. The field sampler indicated the sample designation/location number and date and time of collection in the space provided on the chain-of-custody for each sample. After the samples were sealed and labeled, they were packaged for transport to the analytical laboratory with chain-of-custody forms placed on the inside of the lids of the coolers. The samples were packaged so that they would not leak or spill from the containers, and were transported to AETL and Torrent for analysis.

3.5.3 Chain-of-Custody Protocol

After the environmental samples were collected, chain-of-custody procedures were followed to establish a written record of sample handling and movement between the Site and the analytical laboratory. Each shipping container had a chain-of-custody form completed in triplicate by the sampling personnel. One copy of this form was kept by the sampling team and the other two

copies were sent to the laboratories. One of the laboratory copies become a part of the permanent record for the sample and was returned with the sample analytical results. The chain-of-custody will contain the following information:

- Sample identification number;
- Sample collector's printed name and signature;
- Date and time of collection;
- Place and address of collection;
- Sample matrix;
- Analyses requested;
- Signatures of individuals involved in the chain of possession; and
- Inclusive dates of possession

As stated previously, the chain-of-custody documentation was placed inside the shipping container so that it was immediately apparent to the laboratory personnel receiving the container, and was damaged or lost during transport.

4.0 RESULTS

4.1 Physical Testing Results

A document titled *Report of Soil & Aggregate Properties* prepared by Nova is included as Appendix B to this SAPR. This document provides the results of the geotechnical analysis completed. Of the 39 samples tested, 36 of the samples had a sand content of 75 percent or greater (less than 25 percent fines). Nine of the samples had a sand content of 90 percent or greater (less than 10 percent fines). Three of the samples (five foot depths of borings B4 and B5) and 10 foot depth of boring B6 contained fines at slightly above the 25 percent target threshold in the Fletcher Cove Beach SCOUP. The reported fines content in these samples was 25.6 percent (five foot depth of B4), 28.9 percent (five foot depth of B5) and 25.3 percent (10 foot depth of B6). The average percentages of fines in each of the eight soil borings (average of the discrete samples ranging from one to 20 feet) area as follows:

- B1 – 11 percent
- B2 – 16 percent
- B3 – 14 percent
- B4 – 22 percent
- B5 – 18 percent
- B6 – 22 percent
- B7 – 14 percent
- B8 – 14 percent

All of the above referenced average fines contents are between 10 percent and 25 percentage, a threshold by which a given export location may discharge up to 25,000 cubic yards of upload soil to Fletcher Cove Beach under the SCOUP. The average fines content in all 39 of the soil samples analyzed is 16 percent, which also falls between the 10 and 25 percent target range.

4.2 Chemical Testing Results

Table 1 attached to this report presents all chemical analytical results. The analytical laboratory reports are included as Appendix C of this report. A summary of the chemical testing results is as follows:

Conventionals

- Total organic carbon and total sulfide were not detected at or above the laboratory method detection limits.
- Ammonia concentrations ranged from 4.69 milligrams per kilogram (mg/kg) in COMP B1, B2, B3 to 5.98 mg/kg in COMP B4, B5, B6, B7, B8.
- Moisture content in the soil ranged from 4.20% in COMP B4, B5, B6, B7, B8 to 4.90% in COMP B1, B2, B3.
- Volatile solids content ranged from 0.605% in COMP B1, B2, B3 to 0.776% in COMP B4, B5, B6, B7, B8.
- Total recoverable petroleum hydrocarbons (TRPH) concentrations ranged from 21.0 mg/kg in COMP B1, B2, B3 to 47.0 mg/kg in COMP B4, B5, B6, B7, B8.
- Oil and grease concentrations ranged from 31.5 mg/kg in COMP B1, B2, B3 to 57.5 mg/kg in COMP B4, B5, B6, B7, B8.

- Total solids content ranged from 95.1% in COMP B1, B2, B3 to 95.7% in COMP B4, B5, B6, B7, B8.

None of the above referenced analytes have published National Oceanic and Atmospheric Administration (NOAA) Effects Range Lows (ERLs) and Effects Range Mediums (ERMs) or United States EPA Regional Screening Levels for residential soil (RSLs). Regardless, none of these constituents are considered to be of physical or chemical concern relative to use of said soil at the Fletcher Cove receiving location. This includes the minor reported detections of TRPH and oil and grease. In the absence of detected concentrations of total petroleum hydrocarbons (TPH) in either of the composite soil samples (discussed later in this section) and the lack of any petroleum hydrocarbon impacts in soil noted at the time of sampling, the minor TRPH and oil and grease detection are considered to be indicative of extractable carbon chain compounds that are not associated with a fuel or oil based fingerprint.

Metals

Cadmium, mercury and selenium were not detected at or above the laboratory method detection limits. Detected metals included arsenic, chromium, copper, lead, nickel, silver and zinc, all of which were found at concentrations indicative of naturally occurring concentrations of such elements in southern California soils. Maximum concentrations of such elements were reported at 1.98 mg/kg (arsenic), 7.58 mg/kg (chromium), 1.77 mg/kg (copper), 3.02 mg/kg (lead), 4.65 mg/kg (nickel), 0.0200 mg/kg (silver) and 11.3 mg/kg (zinc). All metals concentrations were below their respective NOAA ERLs and ERMs in addition to their respective United States EPA RSLs as noted in Table 1.

Dioxins/Furans

The only compound in the dioxins/furans analytical suite that was detected above the laboratory detection limits was Octachlorodibenzodioxin (OCDD). This compound was detected at 0.00287 micrograms per kilogram ($\mu\text{g}/\text{kg}$) in sample COMP B1, B2, B3 and 0.00399 $\mu\text{g}/\text{kg}$ in sample COMP B4, B5, B6, B7, B8. This compound is ubiquitous in the environmental and is of very low toxicity. It is approximately 3,000 times less toxic than the most toxic dioxin compound (2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)). As such, there are no published ERLs, ERMs or RSLs for OCDD. However, the analytical laboratory also calculated the dioxin toxicity equivalence (2,3,7,8-TCDD TEQ) for the samples which were reported at 0.0000003 $\mu\text{g}/\text{kg}$ in sample COMP B1, B2, B3 and 0.0000012 $\mu\text{g}/\text{kg}$ in sample COMP B4, B5, B6, B7, B8. There are no published ERLs, ERMs or RSLs for the dioxin TEQ. However, there is a threshold effect level (TEL) for the dioxin TEQ published in the NOAA SQuIRTS Reference Tables of 0.00085 $\mu\text{g}/\text{kg}$ for marine sediment. The TEL was derived from the County of Canada as published in the Canadian Sediment Quality Guidelines for the Protection of Aquatic Life. The concentration of a chemical compound below the TEL represents the minimal effect range within which adverse effects rarely occur (similar to the NOAA ERLs). In addition, the Hawaii Department of Health has published various human health risk based action levels for the dioxin TEQ, and notes a concentration of 0.02 $\mu\text{g}/\text{kg}$ as a screening level indicative of background concentrations of dioxins in the environment where no adverse human health effects are expected. The dioxin TEQ concentrations in the two composite samples of soil collected from the Site are well below both the referenced TEL and Hawaii Department of Health reference levels.

PCB Congeners

One PCB Congener (PCB 052) was detected in sample COMP B4, B5, B6, B7, B8 at a concentration of 0.0091 $\mu\text{g}/\text{kg}$. Multiple PCB Congeners were detected in sample COMP B1, B2, B3 including PCB 052 (0.0262 $\mu\text{g}/\text{kg}$), PCB-077 (0.0147 $\mu\text{g}/\text{kg}$), PCB-110 (0.0291 $\mu\text{g}/\text{kg}$), PCB-118 (0.0161 $\mu\text{g}/\text{kg}$), PCB-138 (0.0455 $\mu\text{g}/\text{kg}$), PCB-149 (0.0219 $\mu\text{g}/\text{kg}$), PCB-153 (0.0216 $\mu\text{g}/\text{kg}$), PCB-167 (0.00907 $\mu\text{g}/\text{kg}$), PCB-170 (0.0133 $\mu\text{g}/\text{kg}$), PCB-180 (0.0262 $\mu\text{g}/\text{kg}$) and PCB-187 (0.0127 $\mu\text{g}/\text{kg}$). All PCB Congener concentrations were below their respective RSLs where

applicable and as noted in Table 1. Total PCB Congener concentrations were reported at 0.092 µg/kg in sample COMP B1, B2, B3 and 0.0091 µg/kg in sample COMP B4, B5, B6, B7, B8. The total PCB Congener concentrations are well below the ERL of 22.7 µg/kg and ERM of 180 µg/kg.

Other Analytes

Organotins, SVOCs (PAHs, phthalates and phenols), OCPs, Pyrethroid compounds, VOCs and TPH were not detected at or above the laboratory method detection limits.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this SAPR, soil within the upper 20 feet at the Site is considered to be compatible for beach placement at Fletcher Cove. No additional sampling and analysis of Site soils (including second tier composites and discrete soil samples or bioassay tests) is considered to be warranted. Based on the physical characteristics of the Site soils (predominant fines content ranging from 10 percent to 25 percent), a maximum volume of up 25,000 cubic yards of soil would be permitted for discharge to Fletcher Cove under the SCOUP (assuming agency approval of the discharge is approved).

In the unlikely event that any petroleum hydrocarbon impacted soil is identified in the former gasoline station area of the Site, during mass grading activities, such soil would be properly segregated and delivered to a licensed and regulated landfill facility, and not to the proposed Fletcher Cove discharge location or another upland location.

Final approval of the discharge of upland soil to the Fletcher Cove receiving location will require the following:

- Approval of this SAPR and concurrence of the conclusions of the document by the United States Army Corps of Engineers and United States EPA (Region 9).
- An agreement to be formalized between Zephyr Partners and the City of Solana Beach.
- Resource agency approvals at the City-level under its individual SCOUP program.
- Resource agency review and approval under the SCOUP program would be in the form of a Project Notification Report that would be distributed to the United States Army Corps of Engineers, the SD-RWQCB, the California Coastal Commission, the California State Lands Commission and other agencies as deemed warranted.

AEC requests concurrence of the conclusions and recommendations of this SAPR from the United States Army Corps of Engineers and United States EPA.

FIGURES



FIGURE 1A
Vicinity Map – Solana Beach 101
 Highway 101 and Dahlia Drive
 Solana Beach, CA 92075



145 Vallecitos De Oro, Suite 201
 San Marcos, CA 92069
 Phone: 760-744-3363 Fax: 760-744-3383

Work Order No.:
 19-228SD

Figure Date:
 April 2019

Drawn By:
 TJ



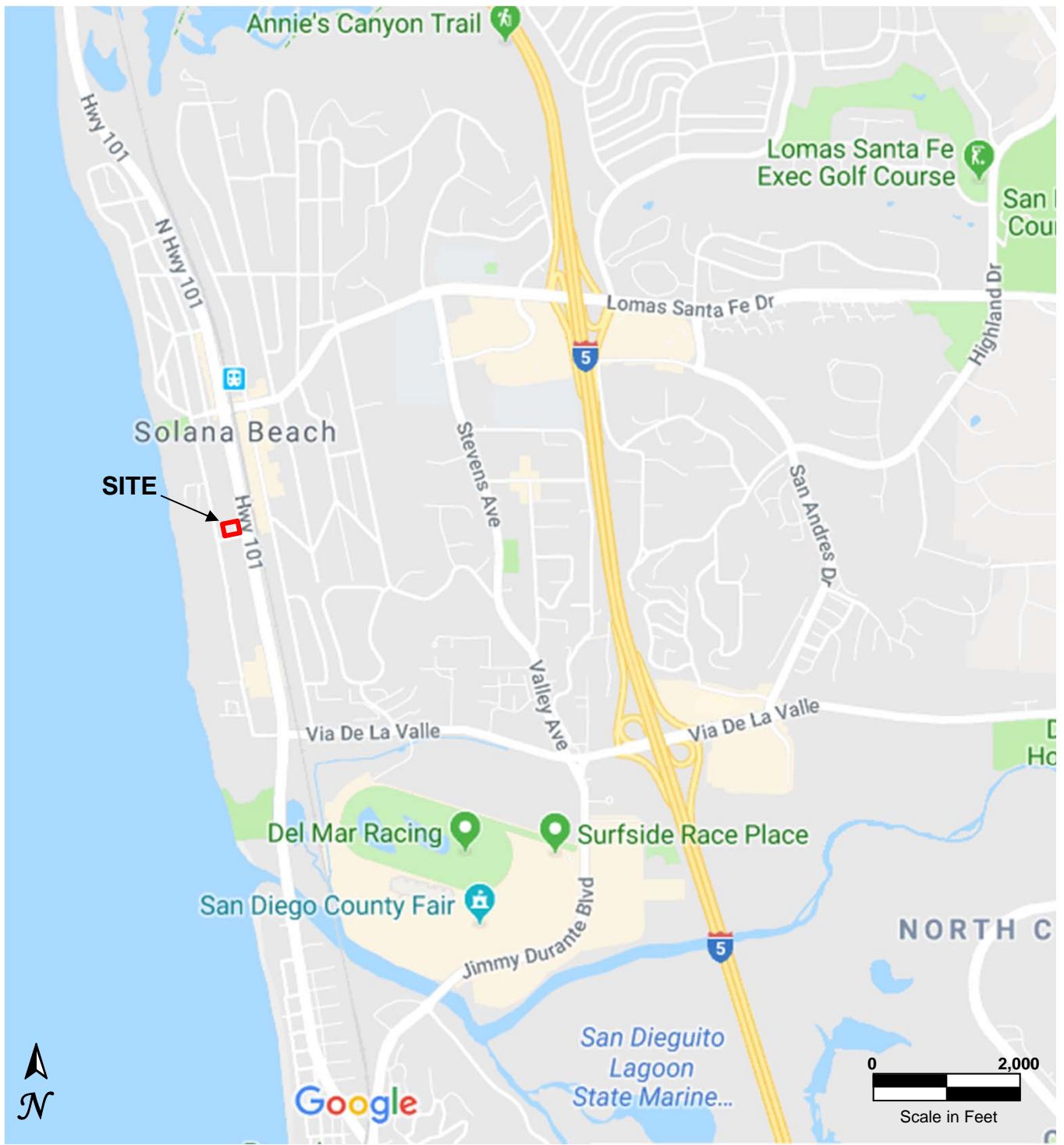
145 Vallecitos De Oro, Suite 201
 San Marcos, CA 92069
 Phone: 760-744-3363 Fax: 760-744-3383

FIGURE 1B
Vicinity Map - Solana Beach 101
 Highway 101 and Dahlia Drive
 Solana Beach, CA 92075

Work Order No.:
 19-228SD

Figure Date:
 April 2019

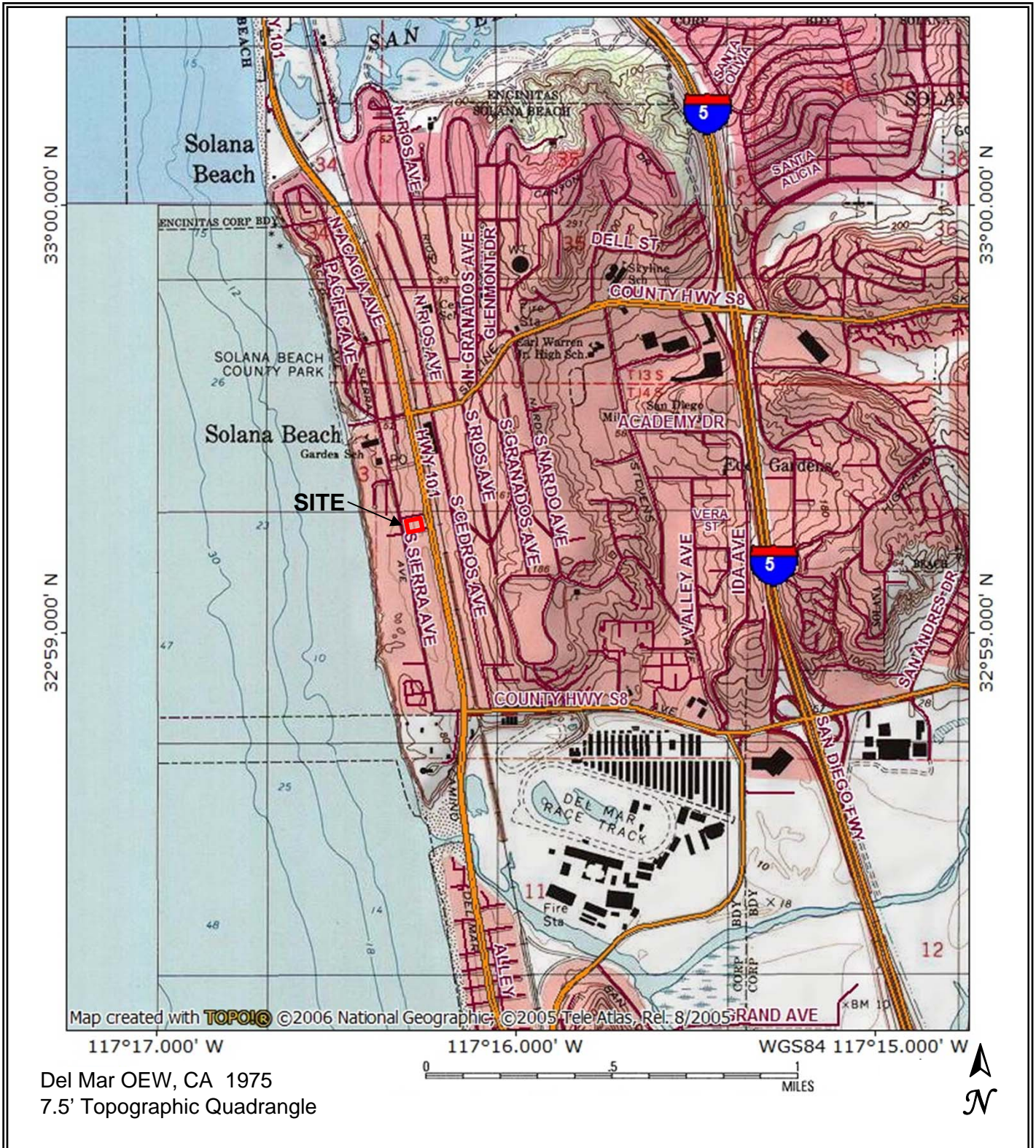
Drawn By:
 TJ



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Figure 1C
Vicinity Map - Solana Beach 101
 Highway 101 and Dahlia Drive
 Solana Beach, CA 92075

Work Order No.: 19-228SD	Figure Date: April 2019	Drawn By: TJ
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Figure 2
Topographic Map - Solana Beach 101
Highway 101 and Dahlia Drive
Solana Beach, CA 92075

Work Order No.: 19-228SD	Figure Date: April 2019	Drawn By: TJ
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— Site Boundary

⊗ Proposed Boring Location

▭ Former USTs

▭ Former Dispenser Islands



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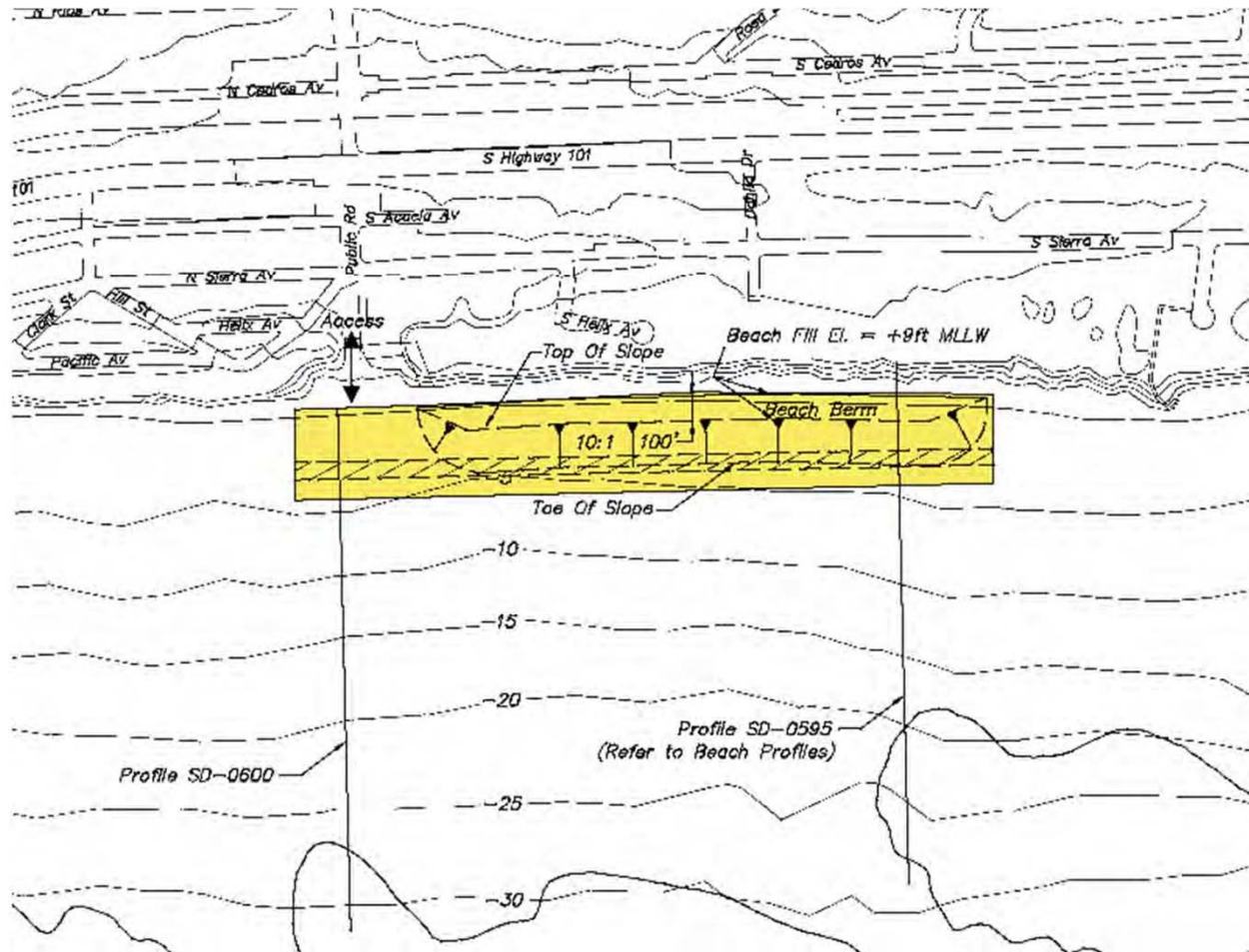
Phone: 760-744-3363
Fax: 760-744-3383

Figure 3 - Site Plan
Solana Beach 101
Highway 101 and Dahlia Drive
Solana Beach, CA 92075

Work Order No.:
19-228SD

Figure Date:
April 2019

Drawn By:
TJ



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Not To Scale

FIGURE 4
Fletcher Cove Beach Discharge Location
Solana Beach, California

Work Order No.:
19-228SD

Report Date:
April 2019

Drawn By:
DW

TABLE

Table 1 – Chemical Analytical Results – Solana 101 Mixed-Use Project, Solana Beach, California

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³	COMP B1-B3	COMP B4-B8
Conventionals	Ammonia	mg/kg				4.69	5.98
	Total Organic Carbon	mg/kg				ND	ND
	Moisture	%				4.90	4.20
	Volatile Solids	%				0.605	0.776
	Total Recoverable Petroleum Hydrocarbons	mg/kg				21.0	47.0
	Oil and Grease	mg/kg				31.5	57.5
	Total Sulfide	mg/kg				ND	ND
	Total Solids	%				95.1	95.7
Metals	Arsenic	mg/kg	8.2	70		1.98	0.823
	Cadmium	mg/kg			71	ND	ND
	Chromium	mg/kg	81	370		4.40	7.58
	Copper	mg/kg	34	270	3,100	1.77	1.75
	Lead	mg/kg	46.7	218	400	3.02	1.06
	Mercury	mg/kg			11	ND	ND
	Nickel	mg/kg	20.9	51.6	670	3.08	4.65
	Selenium	mg/kg			390	ND	ND
	Silver	mg/kg	1	3.7	390	0.0127	0.0200
	Zinc	mg/kg	150	410	23,000	11.3	7.54
	Organotins	Dibutyltin	microg/kg				ND
Monobutyltin		microg/kg				ND	ND
Tetrabutyltin		microg/kg				ND	ND
Tributyltin		microg/kg				ND	ND
SVOCs - PAHs	1-Methylnaphthalene	microg/kg				ND	ND
	2-Methylnaphthalene	microg/kg				ND	ND
	2,4,5-Trichlorophenol	microg/kg				ND	ND

¹ NOAA Effects Range Low

² NOAA Effects Range Medium

³ EPA Regional Screening Level for dermal exposure cancer risk

Table 1 – Chemical Analytical Results – Solana 101 Mixed-Use Project, Solana Beach, California

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³	COMP B1-B3	COMP B4-B8
SVOCs-PAHs	2,4,6-Trichlorophenol	microg/kg				ND	ND
	2,4-Dichlorophenol	microg/kg				ND	ND
	2,4-Dimethylphenol	microg/kg				ND	ND
	2,4-Dinitrophenol	microg/kg				ND	ND
	2-Chlorophenol	microg/kg				ND	ND
	2-Methylnaphthalene	microg/kg				ND	ND
	Acenaphthene	microg/kg	16	500		ND	ND
	Acenaphthylene	microg/kg	44	640		ND	ND
	Anthracene	microg/kg	85.8	1100		ND	ND
	Benzo(a)anthracene	microg/kg	261	1600		ND	ND
	Benzo(a)pyrene	microg/kg	430	1600		ND	ND
	Benzo (b) Fluoranthene	microg/kg				ND	ND
	Benzo (g,h,i) Perylene	microg/kg				ND	ND
	Benzo (k) Fluoranthene	microg/kg				ND	ND
	Chrysene	microg/kg	384	2800		ND	ND
	Dibenz (a,h) Anthracene	microg/kg	63.4	260		ND	ND
	Fluoranthene	microg/kg	600	5100		ND	ND
	Fluorene	microg/kg	19	540		ND	ND
	Indeno (1,2,3-c,d) Pyrene	microg/kg				ND	ND
	Naphthalene	microg/kg	160	2100		ND	ND
	N-Nitrosodimethylamine	microg/kg				ND	ND
	Pentachlorophenol	microg/kg				ND	ND
	Phenanthrene	microg/kg	240	1500		ND	ND
	Pyrene	microg/kg	665	2600		ND	ND
	Total PAHs	microg/kg	4022	44792		ND	ND
PCB Congeners	PCB 018	microg/kg				ND	ND
	PCB 028	microg/kg				ND	ND
	PCB 037	microg/kg				ND	ND
	PCB 044	microg/kg				ND	ND

Table 1 – Chemical Analytical Results – Solana 101 Mixed-Use Project, Solana Beach, California

GROUPING	Attribute	Units	ERL ¹	ERM ²	RSL ³	COMP B1-B3	COMP B4-B8
PCB Congeners	PCB 049	microg/kg				ND	ND
	PCB 052	microg/kg				0.0262	0.0091
	PCB 066	microg/kg				ND	ND
	PCB 070	microg/kg				ND	ND
	PCB 074	microg/kg				ND	ND
	PCB 077	microg/kg			110	0.0147	ND
	PCB 081	microg/kg			110	ND	ND
	PCB 087	microg/kg				ND	ND
	PCB 099	microg/kg				ND	ND
	PCB 101	microg/kg				ND	ND
	PCB 105	microg/kg			110	ND	ND
	PCB 110	microg/kg				0.0291	ND
	PCB 114	microg/kg			2.2	ND	ND
	PCB 118	microg/kg			110	0.0161	ND
	PCB 119	microg/kg				ND	ND
	PCB 123	microg/kg			110	ND	ND
	PCB 126	microg/kg			0.11	ND	ND
	PCB 128	microg/kg				ND	ND
	PCB 138	microg/kg				0.0455	ND
	PCB 149	microg/kg				0.0219	ND
PCB 151	microg/kg				ND	ND	
PCB 153	microg/kg				0.0216	ND	
PCB 156	microg/kg			22	ND	ND	
PCB 157	microg/kg			22	ND	ND	
PCB 158	microg/kg				ND	ND	
PCB 167	microg/kg			1100	0.00907	ND	
PCB 168	microg/kg				ND	ND	
PCB 169	microg/kg			1.1	ND	ND	

Table 1 – Chemical Analytical Results – Solana 101 Mixed-Use Project, Solana Beach, California

GROUPING	Attribute	Units	ERL¹	ERM²	RSL³	COMP B1-B3	COMP B4-B8
PCB Congeners	PCB 170	microg/kg				0.0133	ND
	PCB 177	microg/kg				ND	ND
	PCB 180	microg/kg				0.0262	ND
	PCB 183	microg/kg				ND	ND
	PCB 187	microg/kg				0.0127	ND
	PCB 189	microg/kg			110	ND	ND
	PCB 194	microg/kg				ND	ND
	PCB 201	microg/kg				ND	ND
	PCB 206	microg/kg				ND	ND
	Total PCBs	microg/kg	22.7	180		0.092	0.0091
Organochlorine Pesticides	2,4'-DDD	microg/kg				ND	ND
	2,4'-DDE	microg/kg				ND	ND
	2,4'-DDT	microg/kg				ND	ND
	4,4'-DDD	microg/kg				ND	ND
	4,4'-DDE	microg/kg				ND	ND
	4,4'-DDT	microg/kg				ND	ND
	DDTs	microg/kg				ND	ND
	Aldrin	microg/kg				ND	ND
	Alpha-BHC	microg/kg				ND	ND
	Beta-BHC	microg/kg				ND	ND
	Chlordane	microg/kg				ND	ND
	Delta-BHC	microg/kg				ND	ND
	Dieldrin	microg/kg				ND	ND
	Endosulfan I	microg/kg				ND	ND
	Endosulfan II	microg/kg				ND	ND
	Endosulfan Sulfate	microg/kg				ND	ND
	Endrin	microg/kg				ND	ND
Endrin Aldehyde	microg/kg				ND	ND	

Table 1 – Chemical Analytical Results – Solana 101 Mixed-Use Project, Solana Beach, California

GROUPING	Attribute	Units	ERL¹	ERM²	RSL³	COMP B1-B3	COMP B4-B8
Organochlorine Pesticides	Endrin Ketone	microg/kg				ND	ND
	Gamma-BHC	microg/kg				ND	ND
	Heptachlor	microg/kg				ND	ND
	Heptachlor Epoxide	microg/kg				ND	ND
	Methoxychlor	microg/kg				ND	ND
	Toxaphene	microg/kg				ND	ND
SVOCs - Phthalates	Bis(2-Ethylhexyl) Phthalate	microg/kg			39,000	ND	ND
	Butylbenzyl Phthalate	microg/kg				ND	ND
	Diethyl Phthalate	microg/kg				ND	ND
	Dimethyl Phthalate	microg/kg				ND	ND
	Di-n-butyl Phthalate	microg/kg				ND	ND
	Di-n-octyl Phthalate	microg/kg				ND	ND
SVOCs - Phenols	2-Methylphenol	microg/kg				ND	ND
	2-Nitrophenol	microg/kg				ND	ND
	3,4-Methylphenol	microg/kg				ND	ND
	4,6-Dinitro-2-Methylphenol	microg/kg				ND	ND
	4-Chloro-3-Methylphenol	microg/kg				ND	ND
	Bisphenol A	microg/kg				ND	ND
	Total phenols	microg/kg				ND	ND
Pesticides - Pyrethroids	Allethrin (Bioallethrin)	microg/kg				ND	ND
	Bifenthrin	microg/kg				ND	ND
	Cyfluthrin-beta (Baythroid)	microg/kg				ND	ND
	Cyhalothrin-Lamba	microg/kg				ND	ND
	Cypermethrin	microg/kg				ND	ND
	Deltamethrin (Decamethrin)	microg/kg				ND	ND
	Esfenvalerate	microg/kg				ND	ND
	Fenpropathrin (Danitol)	microg/kg				ND	ND

Table 1 – Chemical Analytical Results – Solana 101 Mixed-Use Project, Solana Beach, California

GROUPING	Attribute	Units	ERL¹	ERM²	RSL³	COMP B1-B3	COMP B4-B8
Pesticides - Pyrethroids	Fenvalerate (sanmarton)	microg/kg				ND	ND
	Fluvalinate	microg/kg				ND	ND
	Permethrin (cis and trans)	microg/kg				ND	ND
	Resmethrin (Bioresmethrin)	microg/kg				ND	ND
	Resmethrin	microg/kg				ND	ND
	Sumithrin (Phenothrin)	microg/kg				ND	ND
	Tetramethrin	microg/kg				ND	ND
	Tralomethrin	microg/kg				ND	ND
Volatile Organic Compounds	All VOCs	microg/kg				ND	ND
Total Petroleum Hydrocarbons	TPH as Gasoline and Light Hydrocarbons	mg/kg				ND	ND
	TPH as Diesel and Heavy Hydrocarbons	mg/kg				ND	ND
Dioxins and Furans	All Dioxins and Furans Toxicity Equivalence (TEQ)	pg/g				0.0086	0.0012

APPENDIX A
SOIL BORING LOGS

BORING LOG

PROJECT: Solana 101 Mixed-Use Project		PROJECT NO.: 19-228SD	LOG OF BORING NO.: B1
BORING LOCATION: See Site Exploration Plan		ELEVATION AND DATUM: Site elevation = ~65 feet above MSL	
DRILLING CONTRACTOR: Astech Environmental		DATE STARTED: 7/16/2019	DATE FINISHED: 7/16/2019
DRILLING METHOD: Direct Push		TOTAL DEPTH: 20 feet	
DRILLING EQUIPMENT: Truck-mounted Geoprobe Rig		DEPTH TO WATER: N/A	
SAMPLING METHOD: DPT sampler lined with acetate sleeves		LOGGED BY: Samantha Hopper	
HAMMER WT.: NA	DROP: NA	RESPONSIBLE PROFESSIONAL: Eric Cathcart	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	Sample Interval	Sample ID			
1	X	B1-1	Asphalt Concrete - ~3 inches thick		
2	X		SILTY SAND, brown, damp, medium dense, fine to medium grained		
4	X	B1-5	POORLY GRADED SAND WITH SILT, orange brown, damp, medium dense, fine to medium grained	0.0	
5	X				
9	X	B1-10	POORLY GRADED SAND WITH SILT, grey brown, damp, medium dense, fine to medium grained	0.0	
10	X				
14	X	B1-15	POORLY GRADED SAND WITH SILT, grey brown, damp, dense, fine to medium grained	0.0	
15	X				

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	DPT Sample	Sample ID			
16					
17					
18					
19					
20		B1-20	POORLY GRADED SAND WITH SILT, light yellow brown, damp, medium dense, fine to medium grained	0.0	
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					

NOTES:

Boring terminated at approx. 20 feet bgs
 No groundwater encountered
 Boring backfilled with hydrated bentonite

BORING LOG

PROJECT: Solana 101 Mixed-Use Project		PROJECT NO.: 19-228SD	LOG OF BORING NO.: B2
BORING LOCATION: See Site Exploration Plan		ELEVATION AND DATUM: Site elevation = ~65 feet above MSL	
DRILLING CONTRACTOR: Astech Environmental		DATE STARTED: 7/16/2019	DATE FINISHED: 7/16/2019
DRILLING METHOD: Direct Push		TOTAL DEPTH: 20 feet	
DRILLING EQUIPMENT: Truck-mounted Geoprobe Rig		DEPTH TO WATER: N/A	
SAMPLING METHOD: DPT sampler lined with acetate sleeves		LOGGED BY: Samantha Hopper	
HAMMER WT.: NA	DROP: NA	RESPONSIBLE PROFESSIONAL: Eric Cathcart	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	Sample Interval	Sample ID			
1	[X]	B2-1	Asphalt Concrete - ~3 inches thick SILTY SAND, grey brown, damp, medium dense, fine to medium grained		
2	[X]				
3					
4	[X]				
5	[X]	B2-5	SILTY SAND, grey brown, damp, medium dense, fine to medium grained	0.0	
6					
7					
8					
9	[X]				
10	[X]	B2-10	SILTY SAND, grey brown, damp, medium dense, fine to medium grained	0.0	
11					
12					
13					
14	[X]				
15	[X]	B2-15	SILTY SAND, light grey, damp, dense, fine to medium grained	0.0	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	DPT Sample	Sample ID			
16					
17					
18					
19					
20		B2-20	POORLY GRADED SAND WITH SILT, light grey, damp, medium dense, fine to medium grained	0.0	
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					

NOTES:

Boring terminated at approx. 20 feet bgs
 No groundwater encountered
 Boring backfilled with hydrated bentonite

BORING LOG

PROJECT: Solana 101 Mixed-Use Project		PROJECT NO.: 19-228SD	LOG OF BORING NO.: B3
BORING LOCATION: See Site Exploration Plan		ELEVATION AND DATUM: Site elevation = ~65 feet above MSL	
DRILLING CONTRACTOR: Astech Environmental		DATE STARTED: 7/16/2019	DATE FINISHED: 7/16/2019
DRILLING METHOD: Direct Push		TOTAL DEPTH: 20 feet	
DRILLING EQUIPMENT: Truck-mounted Geoprobe Rig		DEPTH TO WATER: N/A	
SAMPLING METHOD: DPT sampler lined with acetate sleeves		LOGGED BY: Samantha Hopper	
HAMMER WT.: NA	DROP: NA	RESPONSIBLE PROFESSIONAL: Eric Cathcart	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	Sample Interval	Sample ID			
1	[X]	B3-1	Asphalt Concrete - ~3 inches thick SILTY SAND, brown, damp, medium dense, fine to medium grained		
2	[X]				
3					
4	[X]	B3-5	SILTY SAND, orange brown, damp, medium dense, fine to medium grained	0.0	
5	[X]				
6					
7					
8					
9	[X]	B3-10	POORLY GRADED SAND WITH SILT, orange brown, damp, medium dense, fine to medium grained	0.0	
10	[X]				
11					
12					
13					
14	[X]	B3-15	POORLY GRADED SAND WITH SILT, light brown, damp, medium dense, fine to medium grained	0.0	
15	[X]				

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	DPT Sample	Sample ID			
16					
17					
18					
19					
20		B3-20	POORLY GRADED SAND WITH SILT, light grey, damp, medium dense, fine to medium grained	0.0	
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					

NOTES:

Boring terminated at approx. 20 feet bgs
 No groundwater encountered
 Boring backfilled with hydrated bentonite

BORING LOG

PROJECT: Solana 101 Mixed-Use Project		PROJECT NO.: 19-228SD	LOG OF BORING NO.: B4
BORING LOCATION: See Site Exploration Plan		ELEVATION AND DATUM: Site elevation = ~65 feet above MSL	
DRILLING CONTRACTOR: Astech Environmental		DATE STARTED: 7/16/2019	DATE FINISHED: 7/16/2019
DRILLING METHOD: Direct Push		TOTAL DEPTH: 20 feet	
DRILLING EQUIPMENT: Truck-mounted Geoprobe Rig		DEPTH TO WATER: N/A	
SAMPLING METHOD: DPT sampler lined with acetate sleeves		LOGGED BY: Samantha Hopper	
HAMMER WT.: NA	DROP: NA	RESPONSIBLE PROFESSIONAL: Eric Cathcart	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	Sample Interval	Sample ID			
1	[Interval 1-2]	B4-1	<p style="text-align: center;">SILTY SAND, brown- orange brown, damp, medium dense, fine to medium grained</p> <hr style="border-top: 1px dashed black;"/> <p style="text-align: center;">SILTY SAND, brown- orange brown, damp, medium dense, fine to medium grained</p> <hr style="border-top: 1px dashed black;"/> <p style="text-align: center;">SILTY SAND, brown- orange brown, damp, medium dense, fine to medium grained</p> <hr style="border-top: 1px dashed black;"/> <p style="text-align: center;">SILTY SAND, grey brown, damp, medium dense, fine to medium grained</p>	0.0	
2					
3					
4	[Interval 4-5]	B4-5			
5					
6					
7					
8					
9	[Interval 9-10]	B4-10			
10					
11					
12					
13					
14	[Interval 14-15]	B4-15			
15					

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	DPT Sample	Sample ID			
16					
17					
18					
19					
20		B4-20	SILTY SAND, light grey, dry, medium dense, fine to medium grained	0.0	
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					

NOTES:

Boring terminated at approx. 20 feet bgs
 No groundwater encountered
 Boring backfilled with hydrated bentonite

BORING LOG

PROJECT: Solana 101 Mixed-Use Project		PROJECT NO.: 19-228SD	LOG OF BORING NO.: B5
BORING LOCATION: See Site Exploration Plan		ELEVATION AND DATUM: Site elevation = ~65 feet above MSL	
DRILLING CONTRACTOR: Astech Environmental		DATE STARTED: 7/16/2019	DATE FINISHED: 7/16/2019
DRILLING METHOD: Direct Push		TOTAL DEPTH: 20 feet	
DRILLING EQUIPMENT: Truck-mounted Geoprobe Rig		DEPTH TO WATER: N/A	
SAMPLING METHOD: DPT sampler lined with acetate sleeves		LOGGED BY: Samantha Hopper	
HAMMER WT.: NA	DROP: NA	RESPONSIBLE PROFESSIONAL: Eric Cathcart	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	Sample Interval	Sample ID			
1	[X]	B5-1	SILTY SAND, brown, damp, medium dense, fine to medium grained		
2	[X]				
4	[X]	B5-5	SILTY SAND, brown, damp, medium dense, fine to medium grained	0.0	
5	[X]				
9	[X]	B5-10			
10	[X]				
14	[X]	B5-15	POORLY GRADED SAND WITH SILT, grey brown, dry, medium dense, fine to medium grained	0.0	
15	[X]				

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	DPT Sample	Sample ID			
16					
17					
18					
19					
20		B5-20	POORLY GRADED SAND WITH SILT, light grey, dry, medium dense, fine grained	0.0	
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					

NOTES:

Boring terminated at approx. 20 feet bgs
 No groundwater encountered
 Boring backfilled with hydrated bentonite

BORING LOG

PROJECT: Solana 101 Mixed-Use Project		PROJECT NO.: 19-228SD	LOG OF BORING NO.: B6
BORING LOCATION: See Site Exploration Plan		ELEVATION AND DATUM: Site elevation = ~65 feet above MSL	
DRILLING CONTRACTOR: Astech Environmental		DATE STARTED: 7/16/2019	DATE FINISHED: 7/16/2019
DRILLING METHOD: Direct Push		TOTAL DEPTH: 20 feet	
DRILLING EQUIPMENT: Truck-mounted Geoprobe Rig		DEPTH TO WATER: N/A	
SAMPLING METHOD: DPT sampler lined with acetate sleeves		LOGGED BY: Samantha Hopper	
HAMMER WT.: NA	DROP: NA	RESPONSIBLE PROFESSIONAL: Eric Cathcart	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	Sample Interval	Sample ID			
1	[X]	B6-1	SILTY SAND, light brown, dry, medium dense, fine grained		
2	[X]				
3			SILTY SAND, light brown, dry, medium dense, fine grained	0.0	
4	[X]				
5	[X]	B6-5			
6			SILTY SAND, light brown, dry, medium dense, fine grained	0.0	
7					
8					
9	[X]				
10	[X]	B6-10	SILTY SAND, light brown, dry, medium dense, fine grained	0.0	
11					
12			SILTY SAND, light brown, dry, medium dense, fine grained	0.0	
13					
14	[X]				
15	[X]	B6-15	SILTY SAND, light brown, dry, medium dense, fine grained	0.0	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	DPT Sample	Sample ID			
16					
17					
18					
19					
20		B6-20	SILTY SAND, light grey, dry, medium dense, fine to medium grained	0.0	
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					

NOTES:

Boring terminated at approx. 20 feet bgs
 No groundwater encountered
 Boring backfilled with hydrated bentonite

BORING LOG

PROJECT: Solana 101 Mixed-Use Project		PROJECT NO.: 19-228SD	LOG OF BORING NO.: B7
BORING LOCATION: See Site Exploration Plan		ELEVATION AND DATUM: Site elevation = ~65 feet above MSL	
DRILLING CONTRACTOR: Astech Environmental		DATE STARTED: 7/16/2019	DATE FINISHED: 7/16/2019
DRILLING METHOD: Direct Push		TOTAL DEPTH: 20 feet	
DRILLING EQUIPMENT: Truck-mounted Geoprobe Rig		DEPTH TO WATER: N/A	
SAMPLING METHOD: DPT sampler lined with acetate sleeves		LOGGED BY: Samantha Hopper	
HAMMER WT.: NA	DROP: NA	RESPONSIBLE PROFESSIONAL: Eric Cathcart	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	Sample Interval	Sample ID			
1	[X]	B7-1	SILTY SAND, orange brown, damp, medium dense, fine grained		
2	[X]				
3	[X]				
4	[X]				
5	[X]	B7-5	SILTY SAND, orange brown, dry, medium dense, fine to medium grained	0.0	
6	[X]				
7	[X]				
8	[X]				
9	[X]				
10	[X]	B7-10	POORLY GRADED SAND WITH SILT, light brown, dry, medium dense, fine to medium grained	0.0	
11	[X]				
12	[X]				
13	[X]				
14	[X]				
15	[X]	B7-15	POORLY GRADED SAND WITH SILT, light grey, dry, medium dense, fine grained	0.0	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	DPT Sample	Sample ID			
16					
17					
18					
19					
20		B7-20	SILTY SAND, light grey, dry, medium dense, fine grained	0.0	
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					

NOTES:

Boring terminated at approx. 20 feet bgs
 No groundwater encountered
 Boring backfilled with hydrated bentonite

BORING LOG

PROJECT: Solana 101 Mixed-Use Project		PROJECT NO.: 19-228SD	LOG OF BORING NO.: B8
BORING LOCATION: See Site Exploration Plan		ELEVATION AND DATUM: Site elevation = ~65 feet above MSL	
DRILLING CONTRACTOR: Astech Environmental		DATE STARTED: 7/16/2019	DATE FINISHED: 7/16/2019
DRILLING METHOD: Direct Push		TOTAL DEPTH: 20 feet	
DRILLING EQUIPMENT: Truck-mounted Geoprobe Rig		DEPTH TO WATER: N/A	
SAMPLING METHOD: DPT sampler lined with acetate sleeves		LOGGED BY: Samantha Hopper	
HAMMER WT.: NA	DROP: NA	RESPONSIBLE PROFESSIONAL: Eric Cathcart	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	Sample Interval	Sample ID			
1	[X]	B8-1	SILTY SAND, orange brown, damp, medium dense, fine to medium grained		
2	[X]				
3	[X]				
4	[X]				
5	[X]	B8-5	SILTY SAND, orange brown, damp, medium dense, fine to medium grained	0.0	
6	[X]				
7	[X]				
8	[X]				
9	[X]				
10	[X]	B8-10	SILTY SAND, grey, damp, medium dense, fine to medium grained	0.0	
11	[X]				
12	[X]				
13	[X]				
14	[X]				
15	[X]	B8-15	POORLY GRADED SAND WITH SILT, light grey, dry, medium dense, fine to medium grained	0.0	

Depth (ft)	SAMPLES		SOIL DESCRIPTION	PID (ppm)	REMARKS
	DPT Sample	Sample ID			
16					
17					
18					
19					
20		B8-20	POORLY GRADED SAND WITH SILT, light brown, dry, medium dense, fine to medium grained	0.0	
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					

NOTES:

Boring terminated at approx. 20 feet bgs
 No groundwater encountered
 Boring backfilled with hydrated bentonite

APPENDIX B
GEOTECHNICAL DATA



4373 Viewridge Avenue, Ste. B
 San Diego, CA 92123
 858.292.7575

Report of Soil & Aggregate Properties

Date: August 9, 2019
 Job No: 2018254
 Client: Zephyr Partners
 Project: Solana 101 Mixed-Use Project
 Highway 101 and Dahlia Drive
 Solana Beach, California

Reviewed By: Wail Mokhtar

Sieve Analysis of B-1 @ 1'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	99.4
8	99.0
16	98.7
30	97.3
50	81.5
100	36.6
200	21.0

Sieve Analysis of B-1 @ 5'
(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	89.8
8	73.7
16	67.6
30	61.3
50	36.2
100	17.5
200	11.5



Sieve Analysis of B-1 @ 10'
(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	99.9
30	98.5
50	66.5
100	20.3
200	7.3

Sieve Analysis of B-1 @ 20'
(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	97.5
50	65.5
100	21.0
200	6.8

Sieve Analysis of B-1 @ 15'
(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	99.9
50	85.4
100	21.9
200	7.3

Sieve Analysis of B-2 @ 1'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	99.9
16	99.6
30	96.8
50	62.1
100	31.0
200	18.2



Sieve Analysis of B-2 @ 5'

(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	98.3
50	65.5
100	26.2
200	19.7

Sieve Analysis of B-2 @ 15'

(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	98.4
3/8"	98.1
4	96.9
8	96.0
16	95.1
30	91.3
50	55.2
100	27.6
200	19.8

Sieve Analysis of B-2 @ 10'

(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	96.0
8	92.8
16	90.0
30	84.2
50	51.9
100	25.6
200	17.6

Sieve Analysis of B-2 @ 20'

(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	99.9
16	98.0
30	72.8
50	36.2
100	14.7
200	8.2



Sieve Analysis of B-3 @ 1'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	96.7
50	54.8
100	23.5
200	15.5

Sieve Analysis of B-3 @ 10'
(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	98.2
50	60.5
100	16.2
200	9.0

Sieve Analysis of B-3 @ 5'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	99.9
16	99.6
30	95.2
50	60.2
100	32.6
200	24.3

Sieve Analysis of B-3 @ 15'
(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	99.0
30	84.1
50	46.1
100	13.3
200	6.7



Sieve Analysis of B-3 @ 20'
(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	99.9
8	99.5
16	95.5
30	74.3
50	49.7
100	16.2
200	8.5

Sieve Analysis of B-4 @ 5'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	99.9
30	94.0
50	57.0
100	32.7
200	25.6

Sieve Analysis of B-4 @ 1'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	99.9
8	99.9
16	99.8
30	95.2
50	53.2
100	26.4
200	19.2

Sieve Analysis of B-4 @ 10'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	99.8
30	92.9
50	54.5
100	28.4
200	20.0



Sieve Analysis of B-4 @ 15'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	99.2
50	71.7
100	31.5
200	19.8

Sieve Analysis of B-5 @ 1'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	99.5
8	98.2
16	97.5
30	92.0
50	54.8
100	30.1
200	23.0

Sieve Analysis of B-4 @ 20'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	100.0
50	95.0
100	38.9
200	19.5

Sieve Analysis of B-5 @ 5'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	99.9
30	95.6
50	63.0
100	38.2
200	28.9



Sieve Analysis of B-5 @ 10'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	99.8
30	90.6
50	50.1
100	27.9
200	20.7

Sieve Analysis of B-5 @ 20'
(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	99.7
8	99.6
16	99.0
30	90.9
50	69.6
100	26.1
200	10.3

Sieve Analysis of B-5 @ 15'
(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	98.2
50	58.7
100	17.9
200	8.5

Sieve Analysis of B-6 @ 1'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	99.9
16	99.8
30	95.1
50	55.0
100	27.7
200	19.9



Sieve Analysis of B-6 @ 5'

(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	99.9
30	94.8
50	58.5
100	33.7
200	24.8

Sieve Analysis of B-6 @ 15'

(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	99.9
30	94.9
50	52.4
100	27.4
200	18.7

Sieve Analysis of B-6 @ 10'

(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	99.9
30	93.3
50	58.2
100	34.4
200	25.3

Sieve Analysis of B-7 @ 1'

(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	99.9
16	99.9
30	96.5
50	54.6
100	26.4
200	19.8



Sieve Analysis of B-7 @ 5'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	97.9
50	55.2
100	24.2
200	17.2

Sieve Analysis of B-7 @ 15'
(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	99.8
50	78.4
100	25.7
200	11.8

Sieve Analysis of B-7 @ 10'
(POORLY GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	97.2
50	48.4
100	17.6
200	10.5

Sieve Analysis of B-7 @ 20'
(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	100.0
50	89.7
100	27.6
200	12.3



Sieve Analysis of B-8 @ 1'

(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	99.9
30	96.7
50	54.1
100	23.6
200	15.7

Sieve Analysis of B-8 @ 10'

(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	97.9
50	53.2
100	20.4
200	13.6

Sieve Analysis of B-8 @ 5'

(SILTY SAND)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	99.3
50	62.5
100	25.4
200	18.9

Sieve Analysis of B-8 @ 15'

(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	100.0
30	98.1
50	72.8
100	25.9
200	12.0



Solana 101 Mixed-Use Project
Highway 101 and Dahlia Drive, Solana Beach, California

August 9, 2019
Project No. 2018254

Sieve Analysis of B-8 @ 20'
(POORLY-GRADED SAND WITH SILT)

Sieve Size	% Passing Accumulative
3.0"	100.0
2.5"	100.0
2.0"	100.0
1.5"	100.0
1.0"	100.0
¾"	100.0
½"	100.0
3/8"	100.0
4	100.0
8	100.0
16	99.9
30	96.2
50	48.7
100	14.5
200	7.3

APPENDIX C
ANALYTICAL LABORATORY REPORTS



American Environmental Testing Laboratory Inc.

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Ordered By

Advantage Environmental Consultants
145 Vallecitos De Oro Suite 201
San Marcos, CA 92069-

Number of Pages 37
Date Received 07/17/2019
Date Reported 08/14/2019

Telephone: (760)744-3363
Attention: Dan Weis

Job Number	Order Date	Client
99263	07/17/2019	AEC

Project ID: 19-228SD
Project Name: Solana Mixed-use Project
Site: 329&343 S Hwy 101
112-114,120&128
Dahila Dr., Solana Beach, CA

Enclosed please find results of analyses of 2 soil samples which were analyzed as specified on the attached chain of custody. If there are any questions, please do not hesitate to call.

Attachment: 8 pages

Checked By: _____

Approved By: _____

Cyrus Razmara, Ph.D.
Laboratory Director



American Environmental Testing Laboratory Inc.

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CHAIN OF CUSTODY RECORD

99263

Page 1 of 34

COMPANY: **AEL** PROJECT MANAGER: **Sam Hopper / Dan Weitz**

COMPANY ADDRESS: **145 Valeritos Dr, Ste 201, San Marcos CA**

PROJECT NAME: **Solana Mixed-Use Project** PROJECT #: **19-2285D**

SITE NAME AND ADDRESS: **329343 S. Hwy 101, 112-114, 1207128
Dahlia Dr., Solana Beach, CA** PO #:

AETL JOB No.

ANALYSIS REQUESTED				TEST INSTRUCTIONS & COMMENTS			
TPH 80153	Volcs 82603/055	OCs 8081A	Ti, Fe, Zn Metals	TRPH 164	Volatile Solids	Total Solids	54250B
			6020B/4731A			Total Sulfide	9030
						Organotins	(Kraus et al.)
						Ammonia 350.1	
							Oil & Grease
							See Attachment For Analysis
							Please Report all Results in Dry Weight

RELINQUISHED BY: 1. Signature: _____ Printed Name: _____ Date: _____ Time: _____

RELINQUISHED BY: 2. Signature: _____ Printed Name: _____ Date: _____ Time: _____

RELINQUISHED BY: 3. Signature: _____ Printed Name: _____ Date: _____ Time: _____

SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.
B1-1	99263.01	7-16-19		Soil	Various	ICE
B1-5	99263.02					
B1-10	99263.03					
B1-15	99263.04					
B1-20	99263.05					
B2-1	99263.06					
B2-5	99263.07					
B2-10	99263.08					
B2-15	99263.09					
B2-20	99263.10					
B3-1	99263.11					
B3-5	99263.12					
B3-10	99263.13					
B3-15	99263.14					
B3-20	99263.15					

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY

TOTAL NUMBER OF CONTAINERS: **15** PROPERLY COOLED: Y / N / NA

CUSTODY SEALS: Y / N / NA SAMPLES INTACT: Y / N / NA

RECEIVED IN GOOD COND.: Y / N SAMPLES ACCEPTED: Y / N

TURN AROUND TIME: DATA DELIVERABLE REQUIRED

NORMAL RUSH SAME DAY NEXT DAY 2 DAYS 3 DAYS

WARD COPY PDF GEOTRACKER (GLOBAL ID) OTHER (PLEASE SPECIFY)

RELINQUISHED BY: 1. Signature: _____ Printed Name: **Sam Hopper** Date: **7/12/19** Time: **1040**

RELINQUISHED BY: 2. Signature: _____ Printed Name: _____ Date: _____ Time: _____

RELINQUISHED BY: 3. Signature: _____ Printed Name: _____ Date: _____ Time: _____

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator



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CHAIN OF CUSTODY RECORD

99263

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AETL JOB No.

COMPANY <i>ABC</i>		PROJECT MANAGER <i>Sam Hopper / Dan Weis</i>				
COMPANY ADDRESS 195 Valencitos Blvd, Ste 101, San Marcos CA		PHONE FAX				
PROJECT NAME <i>Palma Mixed-Use Project</i>		PROJECT # <i>19-2285D</i>				
SITE NAME AND ADDRESS <i>3983 S. Hwy 101, #112-114, 120712g Dublin Dr., Solana Beach, CA</i>		PO #				
SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.
84-1	99263.16	7-16-19		Soil	Various	ICE
84-5	99263.17					
84-10	99263.18					
84-15	99263.19					
84-20	99263.20					
85-1	99263.21					
85-5	99263.22					
85-10	99263.23					
85-15	99263.24					
85-20	99263.25					
86-1	99263.26					
86-5	99263.27					
86-10	99263.28					
86-15	99263.29					
86-20	99263.30					

ANALYSIS REQUESTED		TEST INSTRUCTIONS & COMMENTS	
TPH 8015B	TPH 8015B	Oil & Grease	
Vols 8262/8055	Vols 8262/8055	Ammonia 350.1	
OCs 8014	OCs 8014	Organics (Krom et al.)	
TPH 8015B	TPH 8015B	Total Solids	
TPH 8015B	TPH 8015B	Volatle Solids	
TPH 8015B	TPH 8015B	Loss on Ignition	
TPH 8015B	TPH 8015B	See Attachment	
TPH 8015B	TPH 8015B	For Analysis	
TPH 8015B	TPH 8015B	Please Report	
TPH 8015B	TPH 8015B	All Results in	
TPH 8015B	TPH 8015B	Dry Weight	

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY		RELINQUISHED BY	
TOTAL NUMBER OF CONTAINERS	15	1. RELINQUISHED BY:	2. RELINQUISHED BY:
CUSTODY SEALS Y/N/NA		Signature:	Signature:
RECEIVED IN GOOD CONDITION Y/N		Printed Name:	Printed Name:
TURN AROUND TIME		Date:	Date:
<input checked="" type="checkbox"/> NORMAL		Time:	Time:
<input type="checkbox"/> RUSH		RECEIVED BY:	RECEIVED BY:
<input type="checkbox"/> SAME DAY		Signature:	Signature:
<input type="checkbox"/> NEXT DAY		Printed Name:	Printed Name:
<input type="checkbox"/> 2 DAYS		Date:	Date:
<input type="checkbox"/> 3 DAYS		Time:	Time:
<input type="checkbox"/> HARD COPY		RECEIVED BY:	RECEIVED BY:
<input type="checkbox"/> PDF		Signature:	Signature:
<input type="checkbox"/> GEOTRACKER (GLOBAL IZ)		Printed Name:	Printed Name:
<input type="checkbox"/> OTHER (PLEASE SPECIFY)		Date:	Date:
		Time:	Time:

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator



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CHAIN OF CUSTODY RECORD

Page 4 of 4

99263

COMPANY AETL PROJECT MANAGER Sam Boffer / Dan Weis

COMPANY ADDRESS 145 Valletos De do, Steal, San Marcos CA PHONE _____ FAX _____

PROJECT NAME Salina Mixed-Use Project PROJECT # _____

SITE NAME AND ADDRESS 39414 S. Hwy 67, #112-114, 1207129 PO # _____
Dahlia Dr., Solana Beach, CA

AETL JOB No.

ANALYSIS REQUESTED		TEST INSTRUCTIONS & COMMENTS	
TPH 80153	Volts & 86ac/5055	TPH 80153	
OLTS 80114	OLTS 86ac/5055	OLTS 80114	
Tithe 22 Metals	Tithe 22 Metals	Tithe 22 Metals	
TPH 1664	TPH 1664	TPH 1664	
Volatle solids	Volatle solids	Volatle solids	
Total Solids	Total Solids	Total Solids	
Total Solids	Total Solids	Total Solids	
Organic Sol.	Organic Sol.	Organic Sol.	
Ammonia 350.1	Ammonia 350.1	Ammonia 350.1	
		Oil & Grease	

SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.
Compositio 44	99263-46	7-16-19		Soil	Various	JCE
All Depths	99263-47					
Compositio 45	99263-48					
All Depths	99263-49					
Compositio 46	99263-50					
All Depths						

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY

TOTAL NUMBER OF CONTAINERS 20 PROPERLY COOLED Y/N/NA

CUSTODY SEALS Y/N/NA SAMPLES INTACT Y/N/NA

RECEIVED IN GOOD COND. Y/N SAMPLES ACCEPTED Y/N

TURN AROUND TIME
 NORMAL
 RUSH
 SAME DAY
 NEXT DAY
 2 DAYS
 3 DAYS

DATA DELIVERABLE REQUIRED
 HARD COPY
 PDF
 GEOTRACKER (GLOBAL ID)
 OTHER (PLEASE SPECIFY)

RELINQUISHED BY SAMPLER: _____
 Signature: _____
 Printed Name: _____
 Date: 7/17/19 Time: 1040

RELINQUISHED BY: _____
 Signature: _____
 Printed Name: _____
 Date: 7/17/19 Time: 1315

RECEIVED BY: _____
 Signature: _____
 Printed Name: _____
 Date: 7/17/19 Time: 1315

RECEIVED BY: _____
 Signature: _____
 Printed Name: _____
 Date: 7/17/19 Time: 1315

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator



AMERICAN ENVIRONMENTAL TESTING LABORATORY

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TEL (888) 288-AETL (818) 845-8200 FAX (818) 845-8840 www.aetlab.com

COOLER RECEIPT FORM

Client Name: <u>AEC</u>			
Project Name:			
AETL Job Number: <u>99263</u>			
Date Received: <u>07/17/19</u>		Received by: <u>Ant</u>	
Carrier: <input checked="" type="checkbox"/> AETL Courier <input type="checkbox"/> Client <input type="checkbox"/> GSO <input type="checkbox"/> FedEx <input type="checkbox"/> UPS			
<input type="checkbox"/> Others:			
Samples were received in: <input checked="" type="checkbox"/> Cooler (<u>1</u>) <input type="checkbox"/> Other (Specify):			
Inside temperature of shipping container No 1: <u>3.3°C</u> , No 2: _____, No 3: _____			
Type of sample containers: <input checked="" type="checkbox"/> VOA, <input type="checkbox"/> Glass bottles, <input type="checkbox"/> Wide mouth jars, <input type="checkbox"/> HDPE bottles, <input type="checkbox"/> Metal sleeves, <input type="checkbox"/> Others (Specify): <u>pl sleeves + 10x5035</u>			
How are samples preserved: <input type="checkbox"/> None, <input type="checkbox"/> Ice, <input checked="" type="checkbox"/> Blue Ice, <input type="checkbox"/> Dry Ice			
<input type="checkbox"/> None, <input type="checkbox"/> HNO ₃ , <input type="checkbox"/> NaOH, <input type="checkbox"/> ZnOAc, <input type="checkbox"/> HCl, <input type="checkbox"/> Na ₂ S ₂ O ₃ , <input checked="" type="checkbox"/> MeOH			
<input type="checkbox"/> Other (Specify): <u>NaHSO₄H₂O</u>			
	Yes	No, explain below	Name, if client was notified.
1. Are the COCs Correct?	<u>Y</u>		
2. Are the Sample labels legible?	<u>Y</u>		
3. Do samples match the COC?	<u>Y</u>		
4. Are the required analyses clear?	<u>Y</u>		
5. Is there enough samples for required analysis?	<u>Y</u>		
6. Are samples sealed with evidence tape?	<u>Y</u>		
7. Are sample containers in good condition?	<u>Y</u>		
8. Are samples preserved?	<u>Y</u>		
9. Are samples preserved properly for the intended analysis?	<u>Y</u>		
10. Are the VOAs free of headspace?	<u>MIA</u>		
11. Are the jars free of headspace?	<u>?</u>		

Explain all "No" answers for above questions:



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Page: 1 A

Ordered By

Advantage Environmental Consultants
145 Vallecitos De Oro Suite 201
San Marcos, CA 92069-

Project ID: 19-228SD
Date Received 07/17/2019
Date Reported 08/14/2019

Telephone: (760)744-3363

Attention: Dan Weis

Job Number	Order Date	Client
99263	07/17/2019	AEC

CERTIFICATE OF ANALYSIS CASE NARRATIVE

AETL received 50 samples with the following specification on 07/17/2019.

Lab ID	Sample ID	Sample Date	Matrix	Quantity Of Containers
99263.01	B1-1	07/16/2019	Soil	1
99263.02	B1-5	07/16/2019	Soil	1
99263.03	B1-10	07/16/2019	Soil	1
99263.04	B1-15	07/16/2019	Soil	1
99263.05	B1-20	07/16/2019	Soil	1
99263.06	B2-1	07/16/2019	Soil	1
99263.07	B2-5	07/16/2019	Soil	1
99263.08	B2-10	07/16/2019	Soil	1
99263.09	B2-15	07/16/2019	Soil	1
99263.10	B2-20	07/16/2019	Soil	1
99263.11	B3-1	07/16/2019	Soil	1
99263.12	B3-5	07/16/2019	Soil	1
99263.13	B3-10	07/16/2019	Soil	1
99263.14	B3-15	07/16/2019	Soil	1
99263.15	B3-20	07/16/2019	Soil	1
99263.16	B4-1	07/16/2019	Soil	1
99263.17	B4-5	07/16/2019	Soil	1
99263.18	B4-10	07/16/2019	Soil	1
99263.19	B4-15	07/16/2019	Soil	1
99263.20	B4-20	07/16/2019	Soil	1
99263.21	B5-1	07/16/2019	Soil	1
99263.22	B5-5	07/16/2019	Soil	1
99263.23	B5-10	07/16/2019	Soil	1
99263.24	B5-15	07/16/2019	Soil	1

Continued



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San Marcos, CA 92069-

Project ID: 19-228SD
Date Received 07/17/2019
Date Reported 08/14/2019

Telephone: (760)744-3363

Attention: Dan Weis

Job Number	Order Date	Client
99263	07/17/2019	AEC

CERTIFICATE OF ANALYSIS

CASE NARRATIVE

99263.25	B5-20	07/16/2019	Soil	1	
99263.26	B6-1	07/16/2019	Soil	1	
99263.27	B6-5	07/16/2019	Soil	1	
99263.28	B6-10	07/16/2019	Soil	1	
99263.29	B6-15	07/16/2019	Soil	1	
99263.30	B6-20	07/16/2019	Soil	1	
99263.31	B7-1	07/16/2019	Soil	1	
99263.32	B7-5	07/16/2019	Soil	1	
99263.33	B7-10	07/16/2019	Soil	1	
99263.34	B7-15	07/16/2019	Soil	1	
99263.35	B7-20	07/16/2019	Soil	1	
99263.36	B8-1	07/16/2019	Soil	1	
99263.37	B8-5	07/16/2019	Soil	1	
99263.38	B8-10	07/16/2019	Soil	1	
99263.39	B8-15	07/16/2019	Soil	1	
99263.40	B8-20	07/16/2019	Soil	1	
99263.43	COMP B1	07/16/2019	Soil	1	
99263.44	COMP B2	07/16/2019	Soil	1	
99263.45	COMP B3	07/16/2019	Soil	1	
99263.46	COMP B4	07/16/2019	Soil	1	
99263.47	COMP B5	07/16/2019	Soil	1	
99263.48	COMP B6	07/16/2019	Soil	1	
99263.49	COMP B7	07/16/2019	Soil	1	
99263.50	COMP B8	07/16/2019	Soil	1	
	Method ^ Submethod	Req Date	Priority	TAT	Units
	ARCHIVE	07/24/2019	2	Normal	--
99263.41	COMP B1,B2,B3	07/16/2019	Soil		1
99263.42	COMP B4,B5,B6,B7,B8	07/16/2019	Soil		1
	Method ^ Submethod	Req Date	Priority	TAT	Units

Continued



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Page: 1 C

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San Marcos, CA 92069-

Project ID: 19-228SD
Date Received 07/17/2019
Date Reported 08/14/2019

Telephone: (760)744-3363
Attention: Dan Weis

Job Number	Order Date	Client
99263	07/17/2019	AEC

CERTIFICATE OF ANALYSIS

CASE NARRATIVE

99263.42	COMP	07/16/2019	Soil	1
B4, B5, B6, B7, B8				

Method ^ Submethod	Req Date	Priority	TAT	Units
(160.4)	07/24/2019	2	Normal	Percent WT
(1664) ^ TRPH	07/24/2019	2	Normal	mg/Kg
(1664A)	07/24/2019	2	Normal	mg/Kg
(350.3)	07/24/2019	2	Normal	mg/Kg
(6020) ^ CAM-16-MG	07/24/2019	2	Normal	mg/Kg
(8081A)	07/24/2019	2	Normal	ug/Kg
(8260B)	07/24/2019	2	Normal	ug/Kg
(9030B) ^ TOTAL	07/24/2019	2	Normal	mg/Kg
(M8015D) ^ C13-C40	07/24/2019	2	Normal	mg/Kg
(M8015G)	07/24/2019	2	Normal	mg/Kg
(TBT)	07/24/2019	2	Normal	ug/Kg
7471A	07/24/2019	2	Normal	mg/Kg
ASTM-D2216 ^ M&S	07/24/2019	2	Normal	% wt

The samples were analyzed as specified on the enclosed chain of custody. Analytical non-conformances have been noted on the report.

All results of soil samples are based on dry weight.

Checked By: 

Approved By: 

Cyrus Razmara, Ph.D.
Laboratory Director



American Environmental Testing Laboratory Inc.

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ANALYTICAL RESULTS

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 Suite 201
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Site

329&343 S Hwy 101
 112-114,120&128
 Dahila Dr., Solana Beach, CA

Telephone: (760)744-3363

Attn: Dan Weis

Page: 2

Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0719191A1

Our Lab I.D.		Method Blank	99263.41		
Client Sample I.D.			COMP B1,B2,B3		
Date Sampled			07/16/2019		
Date Prepared		07/19/2019	07/16/2019		
Preparation Method		5030	5035A		
Date Analyzed		07/19/2019	07/19/2019		
Matrix		Soil	Soil		
Units		ug/Kg	ug/Kg		
Dilution Factor		1	1		
Analytes	MDL	PQL	Results	Results	
Acetone	25	50	ND	ND	
Benzene	1.0	10.0	ND	ND	
Bromobenzene (Phenyl bromide)	5.0	10.0	ND	ND	
Bromochloromethane	5.0	10.0	ND	ND	
Bromodichloromethane	5.0	10.0	ND	ND	
Bromoform (Tribromomethane)	25	50	ND	ND	
Bromomethane (Methyl bromide)	15	30	ND	ND	
2-Butanone (MEK)	25	50	ND	ND	
n-Butylbenzene	5.0	10.0	ND	ND	
sec-Butylbenzene	5.0	10.0	ND	ND	
tert-Butylbenzene	5.0	10.0	ND	ND	
Carbon Disulfide	25	50	ND	ND	
Carbon tetrachloride	5.0	10.0	ND	ND	
Chlorobenzene	5.0	10.0	ND	ND	
Chloroethane	15	30	ND	ND	
2-Chloroethyl vinyl ether	50	50	ND	ND	
Chloroform (Trichloromethane)	5.0	10.0	ND	ND	
Chloromethane (Methyl chloride)	15	30	ND	ND	
2-Chlorotoluene	5.0	10.0	ND	ND	
4-Chlorotoluene	5.0	10.0	ND	ND	
1,2-Dibromo-3-chloropropane (DBCP)	5.0	10.0	ND	ND	
Dibromochloromethane	5.0	10.0	ND	ND	
1,2-Dibromoethane (EDB)	5.0	10.0	ND	ND	
Dibromomethane	5.0	10.0	ND	ND	
1,2-Dichlorobenzene	5.0	10.0	ND	ND	
1,3-Dichlorobenzene	5.0	10.0	ND	ND	



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Project ID: 19-228SD
 Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0719191A1

Our Lab I.D.		Method Blank	99263.41			
Client Sample I.D.			COMP B1,B2,B3			
Date Sampled			07/16/2019			
Date Prepared		07/19/2019	07/16/2019			
Preparation Method		5030	5035A			
Date Analyzed		07/19/2019	07/19/2019			
Matrix		Soil	Soil			
Units		ug/Kg	ug/Kg			
Dilution Factor		1	1			
Analytes	MDL	PQL	Results	Results		
1,4-Dichlorobenzene	5.0	10.0	ND	ND		
Dichlorodifluoromethane	15	30	ND	ND		
1,1-Dichloroethane	5.0	10.0	ND	ND		
1,2-Dichloroethane (EDC)	5.0	10.0	ND	ND		
1,1-Dichloroethene	5.0	10.0	ND	ND		
cis-1,2-Dichloroethene	5.0	10.0	ND	ND		
trans-1,2-Dichloroethene	5.0	10.0	ND	ND		
1,2-Dichloropropane	5.0	10.0	ND	ND		
1,3-Dichloropropane	5.0	10.0	ND	ND		
2,2-Dichloropropane	5.0	10.0	ND	ND		
1,1-Dichloropropene	5.0	10.0	ND	ND		
cis-1,3-Dichloropropene	5.0	10.0	ND	ND		
trans-1,3-Dichloropropene	5.0	10.0	ND	ND		
Ethylbenzene	1.0	10.0	ND	ND		
Hexachlorobutadiene	15	30	ND	ND		
2-Hexanone	25	50	ND	ND		
Iodomethane	5.0	10.0	ND	ND		
Isopropylbenzene	5.0	10.0	ND	ND		
p-Isopropyltoluene	5.0	10.0	ND	ND		
4-Methyl-2-pentanone (MIBK)	25	50	ND	ND		
Methyl-tert-butyl ether (MTBE)	2.0	10.0	ND	ND		
Methylene chloride (DCM)	25	50	ND	ND		
Naphthalene	5.0	10.0	ND	ND		
n-Propylbenzene	5.0	10.0	ND	ND		
Styrene	5.0	10.0	ND	ND		
1,1,1,2-Tetrachloroethane	5.0	10.0	ND	ND		
1,1,2,2-Tetrachloroethane	5.0	10.0	ND	ND		
Tetrachloroethene	2.0	10.0	ND	ND		
Toluene (Methyl benzene)	1.0	10.0	ND	ND		
1,2,3-Trichlorobenzene	5.0	10.0	ND	ND		
1,2,4-Trichlorobenzene	5.0	10.0	ND	ND		
1,1,1-Trichloroethane	5.0	10.0	ND	ND		
1,1,2-Trichloroethane	5.0	10.0	ND	ND		



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ANALYTICAL RESULTS

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Project ID: 19-228SD
 Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0719191A1

Our Lab I.D.			Method Blank	99263.41		
Client Sample I.D.				COMP B1,B2,B3		
Date Sampled				07/16/2019		
Date Prepared			07/19/2019	07/16/2019		
Preparation Method			5030	5035A		
Date Analyzed			07/19/2019	07/19/2019		
Matrix			Soil	Soil		
Units			ug/Kg	ug/Kg		
Dilution Factor			1	1		
Analytes	MDL	PQL	Results	Results		
Trichloroethene	1.5	10.0	ND	ND		
Trichlorofluoromethane	5.0	10.0	ND	ND		
1,2,3-Trichloropropane	1.0	5.0	ND	ND		
1,2,4-Trimethylbenzene	5.0	10.0	ND	ND		
1,3,5-Trimethylbenzene	5.0	10.0	ND	ND		
Vinyl Acetate	25	50	ND	ND		
Vinyl chloride (Chloroethene)	5.0	10.0	ND	ND		
o-Xylene	1.0	10.0	ND	ND		
m,p-Xylenes	1.0	20.0	ND	ND		
Our Lab I.D.			Method Blank	99263.41		
Surrogates	%Rec.Limit		% Rec.	% Rec.		
Bromofluorobenzene	75-125		105	101		
Dibromofluoromethane	75-125		103	94.1		
Toluene-d8	75-125		101	103		



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0719192A1

Our Lab I.D.		Method Blank	99263.42			
Client Sample I.D.			COMP B4,B5,B6,B7, B8			
Date Sampled			07/16/2019			
Date Prepared		07/19/2019	07/16/2019			
Preparation Method		5030	5035A			
Date Analyzed		07/19/2019	07/19/2019			
Matrix		Soil	Soil			
Units		ug/Kg	ug/Kg			
Dilution Factor		1	1			
Analytes	MDL	PQL	Results	Results		
Acetone	25	50	ND	ND		
Benzene	1.0	10.0	ND	ND		
Bromobenzene (Phenyl bromide)	5.0	10.0	ND	ND		
Bromochloromethane	5.0	10.0	ND	ND		
Bromodichloromethane	5.0	10.0	ND	ND		
Bromoform (Tribromomethane)	25	50	ND	ND		
Bromomethane (Methyl bromide)	15	30	ND	ND		
2-Butanone (MEK)	25	50	ND	ND		
n-Butylbenzene	5.0	10.0	ND	ND		
sec-Butylbenzene	5.0	10.0	ND	ND		
tert-Butylbenzene	5.0	10.0	ND	ND		
Carbon Disulfide	25	50	ND	ND		
Carbon tetrachloride	5.0	10.0	ND	ND		
Chlorobenzene	5.0	10.0	ND	ND		
Chloroethane	15	30	ND	ND		
2-Chloroethyl vinyl ether	50	50	ND	ND		
Chloroform (Trichloromethane)	5.0	10.0	ND	ND		
Chloromethane (Methyl chloride)	15	30	ND	ND		
2-Chlorotoluene	5.0	10.0	ND	ND		
4-Chlorotoluene	5.0	10.0	ND	ND		
1,2-Dibromo-3-chloropropane (DBCP)	5.0	10.0	ND	ND		
Dibromochloromethane	5.0	10.0	ND	ND		
1,2-Dibromoethane (EDB)	5.0	10.0	ND	ND		
Dibromomethane	5.0	10.0	ND	ND		
1,2-Dichlorobenzene	5.0	10.0	ND	ND		



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Project ID: 19-228SD
 Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0719192A1

Our Lab I.D.		Method Blank	99263.42			
Client Sample I.D.			COMP B4,B5,B6,B7, B8			
Date Sampled			07/16/2019			
Date Prepared		07/19/2019	07/16/2019			
Preparation Method		5030	5035A			
Date Analyzed		07/19/2019	07/19/2019			
Matrix		Soil	Soil			
Units		ug/Kg	ug/Kg			
Dilution Factor		1	1			
Analytes	MDL	PQL	Results	Results		
1,3-Dichlorobenzene	5.0	10.0	ND	ND		
1,4-Dichlorobenzene	5.0	10.0	ND	ND		
Dichlorodifluoromethane	15	30	ND	ND		
1,1-Dichloroethane	5.0	10.0	ND	ND		
1,2-Dichloroethane (EDC)	5.0	10.0	ND	ND		
1,1-Dichloroethene	5.0	10.0	ND	ND		
cis-1,2-Dichloroethene	5.0	10.0	ND	ND		
trans-1,2-Dichloroethene	5.0	10.0	ND	ND		
1,2-Dichloropropane	5.0	10.0	ND	ND		
1,3-Dichloropropane	5.0	10.0	ND	ND		
2,2-Dichloropropane	5.0	10.0	ND	ND		
1,1-Dichloropropene	5.0	10.0	ND	ND		
cis-1,3-Dichloropropene	5.0	10.0	ND	ND		
trans-1,3-Dichloropropene	5.0	10.0	ND	ND		
Ethylbenzene	1.0	10.0	ND	ND		
Hexachlorobutadiene	15	30	ND	ND		
2-Hexanone	25	50	ND	ND		
Iodomethane	5.0	10.0	ND	ND		
Isopropylbenzene	5.0	10.0	ND	ND		
p-Isopropyltoluene	5.0	10.0	ND	ND		
4-Methyl-2-pentanone (MIBK)	25	50	ND	ND		
Methyl-tert-butyl ether (MTBE)	2.0	10.0	ND	ND		
Methylene chloride (DCM)	25	50	ND	ND		
Naphthalene	5.0	10.0	ND	ND		
n-Propylbenzene	5.0	10.0	ND	ND		
Styrene	5.0	10.0	ND	ND		
1,1,1,2-Tetrachloroethane	5.0	10.0	ND	ND		
1,1,2,2-Tetrachloroethane	5.0	10.0	ND	ND		
Tetrachloroethene	2.0	10.0	ND	ND		
Toluene (Methyl benzene)	1.0	10.0	ND	ND		
1,2,3-Trichlorobenzene	5.0	10.0	ND	ND		
1,2,4-Trichlorobenzene	5.0	10.0	ND	ND		



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Project ID: 19-228SD
 Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0719192A1

Our Lab I.D.			Method Blank	99263.42		
Client Sample I.D.				COMP B4,B5,B6,B7, B8		
Date Sampled				07/16/2019		
Date Prepared			07/19/2019	07/16/2019		
Preparation Method			5030	5035A		
Date Analyzed			07/19/2019	07/19/2019		
Matrix			Soil	Soil		
Units			ug/Kg	ug/Kg		
Dilution Factor			1	1		
Analytes	MDL	PQL	Results	Results		
1,1,1-Trichloroethane	5.0	10.0	ND	ND		
1,1,2-Trichloroethane	5.0	10.0	ND	ND		
Trichloroethene	1.5	10.0	ND	ND		
Trichlorofluoromethane	5.0	10.0	ND	ND		
1,2,3-Trichloropropane	1.0	5.0	ND	ND		
1,2,4-Trimethylbenzene	5.0	10.0	ND	ND		
1,3,5-Trimethylbenzene	5.0	10.0	ND	ND		
Vinyl Acetate	25	50	ND	ND		
Vinyl chloride (Chloroethene)	5.0	10.0	ND	ND		
o-Xylene	1.0	10.0	ND	ND		
m,p-Xylenes	1.0	20.0	ND	ND		
Our Lab I.D.			Method Blank	99263.42		
Surrogates	%Rec.Limit		% Rec.	% Rec.		
Bromofluorobenzene	75-125		102	99.8		
Dibromofluoromethane	75-125		105	98.1		
Toluene-d8	75-125		105	103		



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (M8015G), TPH as Gasoline and Light Hydrocarbons Using GC/FID

QC Batch No: 0719190B1

Our Lab I.D.			Method Blank	99263.41	99263.42		
Client Sample I.D.				COMP B1,B2,B3	COMP B4,B5,B6,B7, B8		
Date Sampled				07/16/2019	07/16/2019		
Date Prepared			07/19/2019	07/16/2019	07/16/2019		
Preparation Method			5030	5035A	5035A		
Date Analyzed			07/19/2019	07/19/2019	07/19/2019		
Matrix			Soil	Soil	Soil		
Units			mg/Kg	mg/Kg	mg/Kg		
Dilution Factor			1	1	1		
Analytes	MDL	PQL	Results	Results	Results		
TPH as Gasoline and Light HC. (C4-C12)	0.100	1.000	ND	ND	ND		
Our Lab I.D.			Method Blank	99263.41	99263.42		
Surrogates	%Rec.Limit		% Rec.	% Rec.	% Rec.		
Bromofluorobenzene	75-125		108	112	106		



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 071519DB1

Our Lab I.D.			Method Blank	99263.41	99263.42		
Client Sample I.D.				COMP B1,B2,B3	COMP B4,B5,B6,B7, B8		
Date Sampled				07/16/2019	07/16/2019		
Date Prepared			07/15/2019	07/15/2019	07/15/2019		
Preparation Method			3550B	3550B	3550B		
Date Analyzed			07/18/2019	07/18/2019	07/18/2019		
Matrix			Soil	Soil	Soil		
Units			mg/Kg	mg/Kg	mg/Kg		
Dilution Factor			1	1	1		
Analytes	MDL	PQL	Results	Results	Results		
TPH as Diesel (C13-C22)	1.0	5.0	ND	ND	ND		
TPH as Heavy Hydrocarbons (C23-C40)	1.0	5.0	ND	ND	ND		
TPH Total as Diesel and Heavy HC.C13-C40	1.0	5.0	ND	ND	ND		
Our Lab I.D.			Method Blank	99263.41	99263.42		
Surrogates	%Rec.Limit		% Rec.	% Rec.	% Rec.		
Chlorobenzene	75-125		105	103	105		



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8081A), Organochlorine Pesticides by GC

QC Batch No: 071819EB1

Our Lab I.D.			Method Blank	99263.41	99263.42		
Client Sample I.D.				COMP B1,B2,B3	COMP B4,B5,B6,B7, B8		
Date Sampled				07/16/2019	07/16/2019		
Date Prepared			07/18/2019	07/18/2019	07/18/2019		
Preparation Method			3550B	3550B	3550B		
Date Analyzed			07/19/2019	07/19/2019	07/19/2019		
Matrix			Soil	Soil	Soil		
Units			ug/Kg	ug/Kg	ug/Kg		
Dilution Factor			1	1	1		
Analytes	MDL	PQL	Results	Results	Results		
Aldrin	1.0	2.0	ND	ND	ND		
Chlordane (Total)	1.0	2.0	ND	ND	ND		
Chlordane (alpha)	1.0	2.0	ND	ND	ND		
4,4'-DDD (DDD)	1.0	2.0	ND	ND	ND		
4,4'-DDE (DDE)	1.0	2.0	ND	ND	ND		
4,4'-DDT (DDT)	1.0	2.0	ND	ND	ND		
Dieldrin	1.0	2.0	ND	ND	ND		
Endosulfan I	1.0	2.0	ND	ND	ND		
Endosulfan II	1.0	2.0	ND	ND	ND		
Endosulfan sulfate	1.0	2.0	ND	ND	ND		
Endrin	1.0	2.0	ND	ND	ND		
Endrin aldehyde	1.0	2.0	ND	ND	ND		
Endrin ketone	1.0	2.0	ND	ND	ND		
Chlordane (gamma)	1.0	2.0	ND	ND	ND		
Heptachlor	1.0	2.0	ND	ND	ND		
Heptachlor epoxide	1.0	2.0	ND	ND	ND		
alpha-Hexachlorocyclohexane (Alpha-BHC)	1.0	2.0	ND	ND	ND		
beta-Hexachlorocyclohexane (Beta-BHC)	1.0	2.0	ND	ND	ND		
delta-Hexachlorocyclohexane (Delta-BHC)	1.0	2.0	ND	ND	ND		
gamma-Hexachlorocyclohexane (Gamma-BHC, Lindane)	1.0	2.0	ND	ND	ND		
Methoxychlor	5.0	10.0	ND	ND	ND		
Toxaphene	80.0	170.0	ND	ND	ND		



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Project ID: 19-228SD
Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8081A), Organochlorine Pesticides by GC

Our Lab I.D.			Method Blank	99263.41	99263.42		
Surrogates	%Rec.Limit		% Rec.	% Rec.	% Rec.		
Decachlorobiphenyl	30-150		82.8	65.6	63.6		
Tetrachloro-m-xylene	30-150		83.2	86.8	86.8		



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (6020), Title 22 Metals by ICP/MS

QC Batch No: 0722191C7

Our Lab I.D.			Method Blank	99263.41	99263.42		
Client Sample I.D.				COMP B1,B2,B3	COMP B4,B5,B6,B7, B8		
Date Sampled				07/16/2019	07/16/2019		
Date Prepared			07/22/2019	07/22/2019	07/22/2019		
Preparation Method			3050B	3050B	3050B		
Date Analyzed			07/23/2019	07/23/2019	07/23/2019		
Matrix			Soil	Soil	Soil		
Units			mg/Kg	mg/Kg	mg/Kg		
Dilution Factor			1	1	1		
Analytes	MDL	PQL	Results	Results	Results		
Antimony	0.25	0.50	ND	ND	ND		
Arsenic	0.10	0.50	ND	1.98	0.823		
Barium	0.25	0.50	ND	14.5	17.1		
Beryllium	0.10	0.25	ND	ND	ND		
Cadmium	0.10	0.25	ND	ND	ND		
Chromium	0.25	0.50	ND	4.40	7.58		
Cobalt	0.25	0.50	ND	1.40	1.77		
Copper	0.25	0.50	ND	1.77	1.75		
Lead	0.25	0.50	ND	3.02	1.06		
Molybdenum	0.25	0.50	ND	0.750	0.518		
Nickel	0.25	0.50	ND	3.08	4.65		
Selenium	0.25	0.50	ND	ND	ND		
Silver	0.25	0.50	ND	ND	ND		
Thallium	0.10	0.25	ND	ND	ND		
Vanadium	0.25	0.50	ND	9.65	13.9		
Zinc	0.25	0.50	ND	11.3	7.54		



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: 7471A, Mercury in Solid or Semisolid Waste, Cold-Vapor Technique

QC Batch No: 072519-3

Our Lab I.D.		Method Blank	99263.41	99263.42		
Client Sample I.D.			COMP B1,B2,B3	COMP B4,B5,B6,B7, B8		
Date Sampled			07/16/2019	07/16/2019		
Date Prepared		07/25/2019	07/25/2019	07/25/2019		
Preparation Method		7471A	7471A	7471A		
Date Analyzed		07/25/2019	07/25/2019	07/25/2019		
Matrix		Soil	Soil	Soil		
Units		mg/Kg	mg/Kg	mg/Kg		
Dilution Factor		1	1	1		
Analytes	MDL	PQL	Results	Results	Results	
Mercury	0.1	0.2	ND	ND	ND	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (160.4), Total Volatile Solids (TVS), Grav., Ign. at 550 deg C

QC Batch No: VS072219-1

Our Lab I.D.		Method Blank	99263.41	99263.42		
Client Sample I.D.			COMP B1,B2,B3	COMP B4,B5,B6,B7, B8		
Date Sampled			07/16/2019	07/16/2019		
Date Prepared		07/22/2019	07/22/2019	07/22/2019		
Preparation Method		160.4	160.4	160.4		
Date Analyzed		07/23/2019	07/23/2019	07/23/2019		
Matrix		Soil	Soil	Soil		
Units		Percent WT	Percent WT	Percent WT		
Dilution Factor		1	1	1		
Analytes	MDL	PQL	Results	Results	Results	
Total Volatile Solids	0.5	0.5	ND	0.605	0.776	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (1664), Petroleum Hydrocarbons, Total Recoverable, GR

QC Batch No: 072219

Our Lab I.D.		Method Blank	99263.41	99263.42		
Client Sample I.D.			COMP B1,B2,B3	COMP B4,B5,B6,B7, B8		
Date Sampled			07/16/2019	07/16/2019		
Date Prepared		07/22/2019	07/22/2019	07/22/2019		
Preparation Method		1664	1664	1664		
Date Analyzed		07/23/2019	07/23/2019	07/23/2019		
Matrix		Soil	Soil	Soil		
Units		mg/Kg	mg/Kg	mg/Kg		
Dilution Factor		1	1	1		
Analytes	MDL	PQL	Results	Results	Results	
TRPH (Total Rec. Pet. HCs)	1.0	5.0	ND	21.0	47.0	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (1664A), Oil and Grease by Extraction and Gravimetry

QC Batch No: OG072219-1

Our Lab I.D.		Method Blank	99263.41	99263.42		
Client Sample I.D.			COMP B1,B2,B3	COMP B4,B5,B6,B7, B8		
Date Sampled			07/16/2019	07/16/2019		
Date Prepared		07/22/2019	07/22/2019	07/22/2019		
Preparation Method		1664A	1664A	1664A		
Date Analyzed		07/23/2019	07/23/2019	07/23/2019		
Matrix		Soil	Soil	Soil		
Units		mg/Kg	mg/Kg	mg/Kg		
Dilution Factor		1	1	1		
Analytes	MDL	PQL	Results	Results	Results	
Oil and Grease	5.0	5.0	ND	31.5	57.5	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (350.3), Ammonia as Nitrogen, Potentiometric, ISE

QC Batch No: AM071919-1

Our Lab I.D.		Method Blank	99263.41	99263.42		
Client Sample I.D.			COMP B1,B2,B3	COMP B4,B5,B6,B7, B8		
Date Sampled			07/16/2019	07/16/2019		
Date Prepared		07/19/2019	07/19/2019	07/19/2019		
Preparation Method		350.3	350.3	350.3		
Date Analyzed		07/19/2019	07/19/2019	07/19/2019		
Matrix		Soil	Soil	Soil		
Units		mg/Kg	mg/Kg	mg/Kg		
Dilution Factor		1	1	1		
Analytes	MDL	PQL	Results	Results	Results	
Ammonia as Nitrogen	0.50	1.00	ND	4.69	5.98	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (9030B), Total Sulfides, Acid-Soluble and Acid-Insoluble, Distill

QC Batch No: SUT071819-2

Our Lab I.D.		Method Blank	99263.41	99263.42		
Client Sample I.D.			COMP B1,B2,B3	COMP B4,B5,B6,B7, B8		
Date Sampled			07/16/2019	07/16/2019		
Date Prepared		07/18/2019	07/18/2019	07/18/2019		
Preparation Method		9030B	9030B	9030B		
Date Analyzed		07/18/2019	07/18/2019	07/18/2019		
Matrix		Soil	Soil	Soil		
Units		mg/Kg	mg/Kg	mg/Kg		
Dilution Factor		1	1	1		
Analytes	MDL	PQL	Results	Results	Results	
Sulfide, total	0.10	0.50	ND	ND	ND	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: ASTM-D2216, Moisture and Solid Content

QC Batch No: 072319

Our Lab I.D.		Method Blank	99263.41	99263.42		
Client Sample I.D.			COMP B1,B2,B3	COMP B4,B5,B6,B7, B8		
Date Sampled			07/16/2019	07/16/2019		
Date Prepared		07/22/2019	07/22/2019	07/22/2019		
Preparation Method		ASTM-D2216	ASTM-D2216	ASTM-D2216		
Date Analyzed		07/23/2019	07/23/2019	07/23/2019		
Matrix		Soil	Soil	Soil		
Units		% wt	% wt	% wt		
Dilution Factor		1	1	1		
Analytes	MDL	PQL	Results	Results	Results	
Moisture Content	0.1	0.1	ND	4.90	4.30	
Solid content	0.1	0.1	ND	95.1	95.7	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

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AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (TBT), Organotin Compounds by GC-FPD

QC Batch No: 9073051

Our Lab I.D.			Method Blank			
Client Sample I.D.						
Date Sampled						
Date Prepared			07/30/2019			
Preparation Method			TBT			
Date Analyzed			08/09/2019			
Matrix			Soil			
Units			ug/Kg			
Dilution Factor			1			
Analytes	MDL	PQL	Results			
Monobutyltin	2.00	2.00	ND			
Dibutyltin	2.00	2.00	ND			
Tributyltin	1.00	1.00	ND			
Our Lab I.D.			Method Blank			
Surrogates	%Rec.Limit		% Rec.			
Tri-n-propyltin chloride	65-140		106			
Tripentyltin chloride	65-132		107			



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (TBT), Organotin Compounds by GC-FPD

QC Batch No: 9073051

Our Lab I.D.			99263.41	99263.42			
Client Sample I.D.			COMP B1,B2,B3	COMP B4,B5,B6,B7, B8			
Date Sampled			07/16/2019	07/16/2019			
Date Prepared			07/30/2019	07/30/2019			
Preparation Method			TBT	TBT			
Date Analyzed			08/09/2019	08/09/2019			
Matrix			Soil	Soil			
Units			ug/Kg	ug/Kg			
Dilution Factor			100	100			
Analytes	MDL	PQL	Results	Results			
Monobutyltin	200	200	ND	ND			
Dibutyltin	200	200	ND	ND			
Tributyltin	100	100	ND	ND			
Our Lab I.D.			99263.41	99263.42			
Surrogates	%Rec.Limit		% Rec.	% Rec.			
Tri-n-propyltin chloride	65-140		97.0	104			
Tri-pentyltin chloride	65-132		96.0	102			



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (160.4), Total Volatile Solids (TVS), Grav., Ign. at 550 deg C

QC Batch No: VS072219-1; Dup or Spiked Sample: 99236.041; Units: Percent WT

Analytes	SM Result	SM DUP Result	RPD %	SM RPD % Limit						
Total Volatile Solids	0.575	0.495	15.0	<20						



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (1664), Petroleum Hydrocarbons, Total Recoverable, GR

QC Batch No: 072219; LCS: Clean Sand; LCS Prepared: 07/22/2019; LCS Analyzed: 07/23/2019; Units: mg/Kg

Analytes	LCS	LCS	LCS	LCS DUP	LCS DUP	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD	
	Concen	Recov	% REC	Concen	Recov	% REC	% REC	% Limit	% Limit	
TRPH (Total Rec. Pet. HCs)	40.0	37.0	92.5	40.0	34.0	85.0	8.5	75-125	<20	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (1664A), Oil and Grease by Extraction and Gravimetry

QC Batch No: OG072219-1; Dup or Spiked Sample: 99263.42; LCS: Clean Sand; LCS Prepared: 07/22/2019; LCS Analyzed: 07/23/2019;
 Units: mg/Kg

Analytes	SM Result	SM DUP Result	RPD %	SM RPD % Limit						
Oil and Grease	55.0	45.0	20.0	<15						

QC Batch No: OG072219-1; Dup or Spiked Sample: 99263.42; LCS: Clean Sand; LCS Prepared: 07/22/2019; LCS Analyzed: 07/23/2019;
 Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit	
Oil and Grease	40.0	37.0	92.5	40.0	34.0	85.0	8.5	80-120	<15	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (350.3), Ammonia as Nitrogen, Potentiometric, ISE

QC Batch No: AM071919-1; Dup or Spiked Sample: 99263.41; LCS: Clean Sand; LCS Prepared: 07/19/2019; LCS Analyzed: 07/19/2019;
 Units: mg/Kg

Analytes	LCS	LCS	LCS	LCS DUP	LCS DUP	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD	
	Concen	Recov	% REC	Concen	Recov	% REC	% REC	% Limit	% Limit	
Ammonia as Nitrogen	0.500	0.505	101	0.500	0.488	97.6	3.4	80-120	<15	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (6020), Title 22 Metals by ICP/MS

QC Batch No: 0722191C7; Dup or Spiked Sample: 99263.41; LCS: Clean Sand; QC Prepared: 07/22/2019; QC Analyzed: 07/23/2019;
 Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Antimony	0.00	20.0	19.3	96.5	20.0	19.3	96.5	<1	75-125	<15
Arsenic	1.88	20.0	20.4	92.6	20.0	20.5	93.1	<1	75-125	<15
Barium	13.8	20.0	31.6	89.0	20.0	31.6	89.0	<1	75-125	<15
Beryllium	0.00	20.0	18.5	92.5	20.0	18.5	92.5	<1	75-125	<15
Cadmium	0.00	20.0	19.0	95.0	20.0	18.8	94.0	1.1	75-125	<15
Chromium	4.18	20.0	22.2	90.1	20.0	22.1	89.6	<1	75-125	<15
Cobalt	1.33	20.0	22.7	107	20.0	22.7	107	<1	75-125	<15
Copper	1.68	20.0	22.3	103	20.0	22.3	103	<1	75-125	<15
Lead	2.87	20.0	21.3	92.2	20.0	21.3	92.2	<1	75-125	<15
Molybdenum	0.713	20.0	17.6	84.4	20.0	17.9	85.9	1.8	75-125	<15
Nickel	2.93	20.0	21.0	90.4	20.0	22.8	99.4	9.5	75-125	<15
Selenium	0.00	20.0	18.5	92.5	20.0	21.2	106	13.6	75-125	<15
Silver	0.00	20.0	18.8	94.0	20.0	18.8	94.0	<1	75-125	<15
Thallium	0.00	20.0	20.4	102	20.0	20.6	103	<1	75-125	<15
Vanadium	9.18	20.0	26.3	85.6	20.0	26.4	86.1	<1	75-125	<15
Zinc	10.7	20.0	34.3	118	20.0	33.5	114	3.4	75-125	<15

QC Batch No: 0722191C7; Dup or Spiked Sample: 99263.41; LCS: Clean Sand; QC Prepared: 07/22/2019; QC Analyzed: 07/23/2019;
 Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit
Antimony	10.0	9.80	98.0	10.0	9.77	97.7	<1	75-125	<15
Arsenic	10.0	9.79	97.9	10.0	9.98	99.8	1.9	75-125	<15
Barium	10.0	10.3	103	10.0	10.3	103	<1	75-125	<15
Beryllium	10.0	10.2	102	10.0	10.2	102	<1	75-125	<15
Cadmium	10.0	9.64	96.4	10.0	9.61	96.1	<1	75-125	<15
Chromium	10.0	9.84	98.4	10.0	10.6	106	7.4	75-125	<15
Cobalt	10.0	11.1	111	10.0	10.9	109	1.8	75-125	<15
Copper	10.0	10.3	103	10.0	10.1	101	2.0	75-125	<15
Lead	10.0	9.76	97.6	10.0	9.77	97.7	<1	75-125	<15



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Project ID: 19-228SD
Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (6020), Title 22 Metals by ICP/MS

QC Batch No: 0722191C7; Dup or Spiked Sample: 99263.41; LCS: Clean Sand; QC Prepared: 07/22/2019; QC Analyzed: 07/23/2019;
Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit	
Molybdenum	10.0	9.06	90.6	10.0	9.14	91.4	<1	75-125	<15	
Nickel	10.0	10.3	103	10.0	9.94	99.4	3.6	75-125	<15	
Selenium	10.0	10.5	105	10.0	10.5	105	<1	75-125	<15	
Silver	10.0	9.11	91.1	10.0	9.08	90.8	<1	75-125	<15	
Thallium	10.0	10.3	103	10.0	10.3	103	<1	75-125	<15	
Vanadium	10.0	9.36	93.6	10.0	9.32	93.2	<1	75-125	<15	
Zinc	10.0	10.4	104	10.0	10.4	104	<1	75-125	<15	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8081A), Organochlorine Pesticides by GC

QC Batch No: 071819EB1; Dup or Spiked Sample: 99217.01; LCS: Clean Sand; QC Prepared: 07/18/2019; QC Analyzed: 07/19/2019;
 Units: ug/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Aldrin	0.00	20.0	15.3	76.5	20.0	15.8	79.0	3.2	40-150	<40
4,4'-DDT (DDT)	29.7	50.0	72.1	84.8	50.0	72.3	85.2	<1	40-150	<40
Dieldrin	0.690	50.0	39.3	77.2	50.0	43.4	85.4	10.1	40-150	<40
Endrin	9.07	50.0	66.6	115	50.0	65.6	113	1.8	40-150	<40
Heptachlor	0.00	20.0	15.0	75.0	20.0	15.9	79.5	5.8	40-150	<40
gamma-Hexachlorocyclohexane (Gamma-BHC, Lindane)	0.00	20.0	15.0	75.0	20.0	15.0	75.0	<1	40-150	<40
Surrogates										
Decachlorobiphenyl	0.00	25.0	19.3	77.2	25.0	18.3	73.2	5.3	30-150	<40
Tetrachloro-m-xylene	0.00	25.0	21.4	85.6	25.0	20.2	80.8	5.8	30-150	<40

QC Batch No: 071819EB1; Dup or Spiked Sample: 99217.01; LCS: Clean Sand; QC Prepared: 07/18/2019; QC Analyzed: 07/19/2019;
 Units: ug/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit
Aldrin	20.0	13.2	66.0	20.0	13.5	67.5	2.2	50-150	<40
4,4'-DDT (DDT)	50.0	41.6	83.2	50.0	42.1	84.2	1.2	50-150	<40
Dieldrin	50.0	36.5	73.0	50.0	37.7	75.4	3.2	50-150	<40
Endrin	50.0	40.2	80.4	50.0	39.9	79.8	<1	50-150	<40
Heptachlor	20.0	12.4	62.0	20.0	12.6	63.0	1.6	50-150	<40
gamma-Hexachlorocyclohexane (Gamma-BHC, Lindane)	20.0	12.0	60.0	20.0	12.3	61.5	2.5	50-150	<40
Surrogates									
Decachlorobiphenyl	25.0	19.8	79.2	25.0	19.9	79.6	<1	30-150	<40
Tetrachloro-m-xylene	25.0	13.8	55.2	25.0	13.3	53.2	3.7	30-150	<40



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0719191A1; Dup or Spiked Sample: 99316.05; LCS: Clean Sand; QC Prepared: 07/19/2019; QC Analyzed: 07/19/2019;
 Units: ug/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Benzene	0.00	50.0	51.5	103	50.0	51.0	102	<1	75-125	<20
Carbon tetrachloride	0.00	50.0	54.5	109	50.0	53.0	106	2.8	75-125	<20
Chlorobenzene	0.00	50.0	55.5	111	50.0	55.0	110	<1	75-125	<20
Chloroform (Trichloromethane)	0.00	50.0	50.5	101	50.0	50.0	100	<1	75-125	<20
1,2-Dichlorobenzene	0.00	50.0	60.5	121	50.0	59.5	119	1.7	75-125	<20
1,1-Dichloroethane	0.00	50.0	50.0	100	50.0	50.0	100	<1	75-125	<20
1,1-Dichloroethene	0.00	50.0	55.5	111	50.0	55.0	110	<1	75-125	<20
cis-1,2-Dichloroethene	0.00	50.0	50.0	100	50.0	50.0	100	<1	75-125	<20
Ethylbenzene	0.00	50.0	57.0	114	50.0	56.0	112	1.8	75-125	<20
Methyl-tert-butyl ether (MTBE)	0.00	50.0	44.6	89.2	50.0	44.5	89.0	<1	75-125	<20
n-Propylbenzene	0.00	50.0	66.5 #	133	50.0	65.5 #	131	1.5	75-125	<20
Toluene (Methyl benzene)	0.00	50.0	55.5	111	50.0	55.0	110	<1	75-125	<20
1,1,1-Trichloroethane	0.00	50.0	54.0	108	50.0	53.0	106	1.9	75-125	<20
1,1,2-Trichloroethane	0.00	50.0	47.1	94.2	50.0	46.3	92.6	1.7	75-125	<20
Trichloroethene	0.00	50.0	54.0	108	50.0	53.0	106	1.9	75-125	<20
1,2,4-Trimethylbenzene	0.00	50.0	62.5	125	50.0	61.0	122	2.4	75-125	<20
1,3,5-Trimethylbenzene	0.00	50.0	64.5 #	129	50.0	62.5	125	3.1	75-125	<20
o-Xylene	0.00	50.0	56.0	112	50.0	55.5	111	<1	75-125	<20
m,p-Xylenes	0.00	100	114	114	100	112	112	1.8	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	50.0	55.0	110	50.0	54.5	109	<1	75-125	<20
Dibromofluoromethane	0.00	50.0	45.8	91.5	50.0	46.2	92.3	<1	75-125	<20
Toluene-d8	0.00	50.0	50.5	101	50.0	50.5	101	<1	75-125	<20



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Project ID: 19-228SD
 Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0719191A1; Dup or Spiked Sample: 99316.05; LCS: Clean Sand; QC Prepared: 07/19/2019; QC Analyzed: 07/19/2019;
 Units: ug/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit
Benzene	50.0	47.9	95.8	50.0	46.7	93.4	2.5	75-125	<20
Carbon tetrachloride	50.0	47.3	94.6	50.0	46.0	92.0	2.8	75-125	<20
Chlorobenzene	50.0	52.0	104	50.0	51.5	103	<1	75-125	<20
Chloroform (Trichloromethane)	50.0	47.4	94.8	50.0	46.6	93.2	1.7	75-125	<20
1,2-Dichlorobenzene	50.0	57.5	115	50.0	57.5	115	<1	75-125	<20
1,1-Dichloroethane	50.0	46.5	93.0	50.0	45.5	91.0	2.2	75-125	<20
1,1-Dichloroethene	50.0	48.9	97.8	50.0	46.8	93.6	4.4	75-125	<20
cis-1,2-Dichloroethene	50.0	47.6	95.2	50.0	46.5	93.0	2.3	75-125	<20
Ethylbenzene	50.0	51.0	102	50.0	50.0	100	2.0	75-125	<20
Methyl-tert-butyl ether (MTBE)	50.0	48.6	97.2	50.0	48.5	97.0	<1	75-125	<20
n-Propylbenzene	50.0	57.0	114	50.0	56.5	113	<1	75-125	<20
Toluene (Methyl benzene)	50.0	51.0	102	50.0	50.0	100	2.0	75-125	<20
1,1,1-Trichloroethane	50.0	48.3	96.6	50.0	47.1	94.2	2.5	75-125	<20
1,1,2-Trichloroethane	50.0	50.5	101	50.0	51.0	102	<1	75-125	<20
Trichloroethene	50.0	48.8	97.6	50.0	47.5	95.0	2.7	75-125	<20
1,2,4-Trimethylbenzene	50.0	55.0	110	50.0	54.5	109	<1	75-125	<20
1,3,5-Trimethylbenzene	50.0	56.0	112	50.0	55.5	111	<1	75-125	<20
o-Xylene	50.0	52.0	104	50.0	51.0	102	1.9	75-125	<20
m,p-Xylenes	100	101	101	100	100	100	<1	75-125	<20
Surrogates									
Bromofluorobenzene	50.0	54.0	108	50.0	54.0	108	<1	75-125	<20
Dibromofluoromethane	50.0	46.4	92.8	50.0	46.4	92.7	<1	75-125	<20
Toluene-d8	50.0	49.7	99.3	50.0	50.0	99.9	<1	75-125	<20



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0719192A1; Dup or Spiked Sample: 99263.42; LCS: Clean Sand; QC Prepared: 07/19/2019; QC Analyzed: 07/19/2019;
 Units: ug/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Benzene	0.00	50.0	40.8	81.6	50.0	42.1	84.2	3.1	75-125	<20
Carbon tetrachloride	0.00	50.0	45.2	90.4	50.0	46.5	93.0	2.8	75-125	<20
Chlorobenzene	0.00	50.0	47.0	94.0	50.0	48.2	96.4	2.5	75-125	<20
Chloroform (Trichloromethane)	0.00	50.0	43.4	86.8	50.0	44.9	89.8	3.4	75-125	<20
1,2-Dichlorobenzene	0.00	50.0	45.5	91.0	50.0	47.0	94.0	3.2	75-125	<20
1,1-Dichloroethane	0.00	50.0	42.7	85.4	50.0	44.2	88.4	3.5	75-125	<20
1,1-Dichloroethene	0.00	50.0	41.7	83.4	50.0	43.3	86.6	3.8	75-125	<20
cis-1,2-Dichloroethene	0.00	50.0	39.9	79.8	50.0	41.2	82.4	3.2	75-125	<20
Ethylbenzene	0.00	50.0	45.6	91.2	50.0	47.1	94.2	3.2	75-125	<20
Methyl-tert-butyl ether (MTBE)	0.00	50.0	37.6	75.2	50.0	39.1	78.2	3.9	75-125	<20
n-Propylbenzene	0.00	50.0	45.5	91.0	50.0	46.2	92.4	1.5	75-125	<20
Toluene (Methyl benzene)	0.00	50.0	45.2	90.4	50.0	46.5	93.0	2.8	75-125	<20
1,1,1-Trichloroethane	0.00	50.0	45.4	90.8	50.0	46.1	92.2	1.5	75-125	<20
1,1,2-Trichloroethane	0.00	50.0	39.0	78.0	50.0	40.4	80.8	3.5	75-125	<20
Trichloroethene	0.00	50.0	45.6	91.2	50.0	47.0	94.0	3.0	75-125	<20
1,2,4-Trimethylbenzene	0.00	50.0	46.4	92.8	50.0	47.8	95.6	3.0	75-125	<20
1,3,5-Trimethylbenzene	0.00	50.0	46.8	93.6	50.0	48.9	97.8	4.4	75-125	<20
o-Xylene	0.00	50.0	47.9	95.8	50.0	49.2	98.4	2.7	75-125	<20
m,p-Xylenes	0.00	100	92.5	92.5	100	95.8	95.8	3.5	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	50.0	49.9	99.7	50.0	50.0	100	<1	75-125	<20
Dibromofluoromethane	0.00	50.0	47.7	95.3	50.0	48.9	97.8	2.6	75-125	<20
Toluene-d8	0.00	50.0	51.5	103	50.0	52.0	104	<1	75-125	<20



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Project ID: 19-228SD
 Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (8260B), Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 0719192A1; Dup or Spiked Sample: 99263.42; LCS: Clean Sand; QC Prepared: 07/19/2019; QC Analyzed: 07/19/2019;
 Units: ug/Kg

Analytes	LCS	LCS	LCS	LCS DUP	LCS DUP	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD	
	Concen	Recov	% REC	Concen	Recov	% REC	% REC	% Limit	% Limit	
Benzene	50.0	44.7	89.4	50.0	46.5	93.0	3.9	75-125	<20	
Carbon tetrachloride	50.0	50.5	101	50.0	53.0	106	4.8	75-125	<20	
Chlorobenzene	50.0	52.0	104	50.0	53.5	107	2.8	75-125	<20	
Chloroform (Trichloromethane)	50.0	47.9	95.8	50.0	49.5	99.0	3.3	75-125	<20	
1,2-Dichlorobenzene	50.0	53.5	107	50.0	53.5	107	<1	75-125	<20	
1,1-Dichloroethane	50.0	46.3	92.6	50.0	49.0	98.0	5.7	75-125	<20	
1,1-Dichloroethene	50.0	46.0	92.0	50.0	47.0	94.0	2.2	75-125	<20	
cis-1,2-Dichloroethene	50.0	43.9	87.8	50.0	45.5	91.0	3.6	75-125	<20	
Ethylbenzene	50.0	51.0	102	50.0	53.0	106	3.8	75-125	<20	
Methyl-tert-butyl ether (MTBE)	50.0	43.2	86.4	50.0	44.0	88.0	1.8	75-125	<20	
n-Propylbenzene	50.0	52.5	105	50.0	53.0	106	<1	75-125	<20	
Toluene (Methyl benzene)	50.0	49.2	98.4	50.0	51.0	102	3.6	75-125	<20	
1,1,1-Trichloroethane	50.0	50.0	100	50.0	52.0	104	3.9	75-125	<20	
1,1,2-Trichloroethane	50.0	46.5	93.0	50.0	47.0	94.0	1.1	75-125	<20	
Trichloroethene	50.0	51.0	102	50.0	53.0	106	3.8	75-125	<20	
1,2,4-Trimethylbenzene	50.0	52.0	104	50.0	52.5	105	<1	75-125	<20	
1,3,5-Trimethylbenzene	50.0	52.5	105	50.0	53.5	107	1.9	75-125	<20	
o-Xylene	50.0	52.5	105	50.0	54.0	108	2.8	75-125	<20	
m,p-Xylenes	100	104	104	100	106	106	1.9	75-125	<20	
Surrogates										
Bromofluorobenzene	50.0	51.5	103	50.0	51.0	102	<1	75-125	<20	
Dibromofluoromethane	50.0	49.5	99.0	50.0	50.0	100	1.0	75-125	<20	
Toluene-d8	50.0	50.0	100	50.0	51.5	103	3.0	75-125	<20	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (9030B), Total Sulfides, Acid-Soluble and Acid-Insoluble, Distill

QC Batch No: SUT071819-2; Dup or Spiked Sample: 99263.41; LCS: Clean Sand; LCS Prepared: 07/18/2019; LCS Analyzed: 07/18/2019;
 Units: mg/Kg

Analytes	SM Result	SM DUP Result	RPD %	SM RPD % Limit						
Sulfide, total	ND	ND	<1	<20						

QC Batch No: SUT071819-2; Dup or Spiked Sample: 99263.41; LCS: Clean Sand; LCS Prepared: 07/18/2019; LCS Analyzed: 07/18/2019;
 Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit	
Sulfide, total	0.200	0.160	80.0	0.200	0.162	81.0	1.2	70-130	<20	



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (M8015D), TPH as Diesel and Heavy Hydrocarbons Using GC/FID

QC Batch No: 071519DB1; Dup or Spiked Sample: 99261.06; LCS: Clean Sand; QC Prepared: 07/15/2019; QC Analyzed: 07/18/2019;
 Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
TPH as Diesel (C13-C22)	0.00	500	500	100	500	520	104	3.9	75-125	<20
Surrogates										
Chlorobenzene	0.00	100	102	102	100	101	101	<1	75-125	<20

QC Batch No: 071519DB1; Dup or Spiked Sample: 99261.06; LCS: Clean Sand; QC Prepared: 07/15/2019; QC Analyzed: 07/18/2019;
 Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit
TPH as Diesel (C13-C22)	500	505	101	500	492	98.4	2.6	75-125	<20
Surrogates									
Chlorobenzene	100	99.0	99.0	100	96.7	96.7	2.4	75-125	<20



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Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (M8015G), TPH as Gasoline and Light Hydrocarbons Using GC/FID

QC Batch No: 071919OB1; Dup or Spiked Sample: 99263.42AGA; LCS: Clean Sand; QC Prepared: 07/19/2019; MS Analyzed: 07/20/2019;
 LCS Analyzed: 07/19/2019; Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
TPH as Gasoline and Light HC. (C4-C12)	0.0169	1.00	0.923	90.6	1.00	0.930	91.3	<1	75-125	<20
Surrogates										
Bromofluorobenzene	0.00	0.0500	0.0494	98.8	0.0500	0.0575	115	15.2	75-125	<20

QC Batch No: 071919OB1; Dup or Spiked Sample: 99263.42AGA; LCS: Clean Sand; QC Prepared: 07/19/2019; MS Analyzed: 07/20/2019;
 LCS Analyzed: 07/19/2019; Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit
TPH as Gasoline and Light HC. (C4-C12)	1.00	0.944	94.4	1.00	0.949	94.9	<1	75-125	<20
Surrogates									
Bromofluorobenzene	0.0500	0.0550	110	0.0500	0.0550	110	<1	75-125	<20



American Environmental Testing Laboratory Inc.

2834 & 2908 North Naomi Street Burbank, CA 91504 • DOHS NO: 1541, LACSD NO: 10181
Tel: (888) 288-AETL • (818) 845-8200 • Fax: (818) 845-8840 • www.aetlab.com

QUALITY CONTROL RESULTS

Ordered By

Advantage Environmental Consultants
145 Vallecitos De Oro
Suite 201
San Marcos, CA 92069-

Site

329&343 S Hwy 101
112-114,120&128
Dahila Dr., Solana Beach, CA

Telephone: (760)744-3363

Attn: Dan Weis

Page: 36

Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: (TBT), Organotin Compounds by GC-FPD

QC Batch No: 9073051; LCS: Clean Sand; LCS Prepared: 07/30/2019; LCS Analyzed: 08/09/2019; Units: ug/Kg

Analytes	LCS	LCS	LCS	LCS DUP	LCS DUP	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD	
	Concen	Recov	% REC	Concen	Recov	% REC	% REC	% Limit	% Limit	
Monobutyltin	25.0	18.0	72.0	25.0	20.5	82.0	13.0	0-140	<30	
Dibutyltin	25.0	24.0	96.0	25.0	25.0	100	4.1	39-150	<30	
Tributyltin	25.0	28.8	115	25.0	25.5	102	12.0	58-128	<30	



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QUALITY CONTROL RESULTS

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Telephone: (760)744-3363

Attn: Dan Weis

Page: 37

Project ID: 19-228SD

Project Name: Solana Mixed-use Project

AETL Job Number	Submitted	Client
99263	07/17/2019	AEC

Method: 7471A, Mercury in Solid or Semisolid Waste, Cold-Vapor Technique

QC Batch No: 072519-3; Dup or Spiked Sample: 99263.41; LCS: Clean Sand; QC Prepared: 07/25/2019; QC Analyzed: 07/25/2019;
 Units: mg/Kg

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Mercury	0.00	0.500	0.525	105	0.500	0.540	108	2.8	75-125	<15

QC Batch No: 072519-3; Dup or Spiked Sample: 99263.41; LCS: Clean Sand; QC Prepared: 07/25/2019; QC Analyzed: 07/25/2019;
 Units: mg/Kg

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit
Mercury	0.500	0.550	110	0.500	0.550	110	<1	75-125	<15



AMERICAN ENVIRONMENTAL TESTING LABORATORY

2834 NORTH NAOMI ST. BURBANK, CALIFORNIA 91504 DHS # 1541 LACSD# 10181

TEL (888) 288-AETL (818) 845-8200 FAX (818) 845-8840 www.aetlab.com

Data Qualifiers and Descriptors

Data Qualifier:

- #: Recovery is not within acceptable control limits.
- *: In the QC section, sample results have been taken directly from the ICP reading. No preparation factor has been applied.
- B: Analyte was present in the Method Blank.
- D: Result is from a diluted analysis.
- E: Result is beyond calibration limits and is estimated.
- H: Analysis was performed over the allowed holding time due to circumstances which were beyond laboratory control.
- J: Analyte was detected . However, the analyte concentration is an estimated value, which is between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL).
- M: Matrix spike recovery is outside control limits due to matrix interference. Laboratory Control Sample recovery was acceptable.
- MCL: Maximum Contaminant Level
- NS: No Standard Available
- S6: Surrogate recovery is outside control limits due to matrix interference.
- S8: The analysis of the sample required a dilution such that the surrogate concentration was diluted below the method acceptance criteria.
- X: Results represent LCS and LCSD data.

Definition:

- %Limi: Percent acceptable limits.
- %REC: Percent recovery.
- Con.L: Acceptable Control Limits
- Conce: Added concentration to the sample.
- LCS: Laboratory Control Sample
- MDL: Method Detection Limit is a statistically derived number which is specific for each instrument, each method, and each compound. It indicates a distinctively detectable quantity with 99% probability.



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2834 NORTH NAOMI ST. BURBANK, CALIFORNIA 91504 DHS # 1541 LACSD# 10181

TEL (888) 288-AETL (818) 845-8200 FAX (818) 845-8840 www.aetlab.com

Data Qualifiers and Descriptors

MS:	Matrix Spike
MS DU:	Matrix Spike Duplicate
ND:	Analyte was not detected in the sample at or above MDL.
PQL:	Practical Quantitation Limit or ML (Minimum Level as per RWQCB) is the minimum concentration that can be quantified with more than 99% confidence. Taking into account all aspects of the entire analytical instrumentation and practice.
Recov:	Recovered concentration in the sample.
RPD:	Relative Percent Difference

EnviroMatrix



Analytical, Inc.

10 August 2019

American Environmental Testing Laboratory
Attn: Jim Lin
2834 North Naomi Street
Burbank, CA 91504

EMA Log #: 19G1001

Project Name: 114778 / July 16, 2019

Enclosed are the results of analyses for samples received by the laboratory on 07/29/19 13:03. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that this data is in compliance both technically and for completeness.

A handwritten signature in black ink, appearing to read 'Dan Verdon', is written over a light blue horizontal line.

Dan Verdon
Laboratory Director

CA ELAP Certification #: 2564

4340 Viewridge Avenue, Suite A - San Diego, California 92123 - (858) 560-7717 - Fax (858) 560-7763
Analytical Chemistry Laboratory

Client Name: American Environmental Testing Laboratory
Project Name: 114778 / July 16, 2019

EMA Log #: 19G1001

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
99263.41	19G1001-01	Soil	07/16/19 12:00	07/29/19 13:03
99263.42	19G1001-02	Soil	07/16/19 12:00	07/29/19 13:03

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Client Name: American Environmental Testing Laboratory
 Project Name: 114778 / July 16, 2019

EMA Log #: 19G1001

Organotin Compounds by GC - FPD

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
99263.41 (19G1001-01) Soil										R-06
Sampled: 07/16/19 12:00 Received: 07/29/19 13:03										
Tributyltin	ND	99.0	100	ug/kg	10	9073051	07/30/19	08/09/19	GC - FPD	
Dibutyltin	ND	115	200	"	"	"	"	"	"	
Monobutyltin	ND	55.0	200	"	"	"	"	"	"	
Surrogate: Tripentyltin		96 %	65-132			"	"	"	"	
Surrogate: Tri-n-propyltin		97 %	65-140			"	"	"	"	
99263.42 (19G1001-02) Soil										R-06
Sampled: 07/16/19 12:00 Received: 07/29/19 13:03										
Tributyltin	ND	99.0	100	ug/kg	10	9073051	07/30/19	08/09/19	GC - FPD	
Dibutyltin	ND	115	200	"	"	"	"	"	"	
Monobutyltin	ND	55.0	200	"	"	"	"	"	"	
Surrogate: Tripentyltin		102 %	65-132			"	"	"	"	
Surrogate: Tri-n-propyltin		104 %	65-140			"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Client Name: American Environmental Testing Laboratory
 Project Name: 114778 / July 16, 2019

EMA Log #: 19G1001

Organotin Compounds by GC - FPD - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 9073051

Blank (9073051-BLK1)

Prepared: 07/30/19 Analyzed: 08/09/19

Tributyltin	ND	0.990	1.00	ug/kg							
Dibutyltin	ND	1.15	2.00	"							
Monobutyltin	ND	0.550	2.00	"							
Surrogate: Tripentyltin	23.9			"	25.0		96	65-132			
Surrogate: Tri-n-propyltin	22.2			"	25.0		89	65-140			

LCS (9073051-BS1)

Prepared: 07/30/19 Analyzed: 08/09/19

Tributyltin	28.7	0.990	1.00	ug/kg	25.0		115	58-128			
Dibutyltin	23.9	1.15	2.00	"	25.0		96	39-150			
Monobutyltin	17.9	0.550	2.00	"	25.0		72	0-140			
Surrogate: Tripentyltin	26.6			"	25.0		106	65-132			
Surrogate: Tri-n-propyltin	26.1			"	25.0		104	65-140			

LCS Dup (9073051-BSD1)

Prepared: 07/30/19 Analyzed: 08/09/19

Tributyltin	25.6	0.990	1.00	ug/kg	25.0		102	58-128	11	30	
Dibutyltin	25.1	1.15	2.00	"	25.0		100	39-150	5	30	
Monobutyltin	20.4	0.550	2.00	"	25.0		82	0-140	13	30	
Surrogate: Tripentyltin	26.5			"	25.0		106	65-132			
Surrogate: Tri-n-propyltin	23.9			"	25.0		96	65-140			

Duplicate (9073051-DUP1)

Source: 19G1001-01

Prepared: 07/30/19 Analyzed: 08/09/19

R-06

Tributyltin	ND	99.0	100	ug/kg		ND				30	
Dibutyltin	ND	115	200	"		ND				30	
Monobutyltin	ND	55.0	200	"		ND				30	
Surrogate: Tripentyltin	239			"	250		95	65-132			
Surrogate: Tri-n-propyltin	227			"	250		91	65-140			

Matrix Spike (9073051-MS1)

Source: 19G1001-01

Prepared: 07/30/19 Analyzed: 08/09/19

Tributyltin	260	99.0	100	ug/kg	250	ND	104	45-139			
Dibutyltin	242	115	200	"	250	ND	97	0-165			
Monobutyltin	84.7	55.0	200	"	250	ND	34	0-140			J
Surrogate: Tripentyltin	241			"	250		97	65-132			
Surrogate: Tri-n-propyltin	255			"	250		102	65-140			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Client Name: American Environmental Testing Laboratory
 Project Name: 114778 / July 16, 2019

EMA Log #: 19G1001

Organotin Compounds by GC - FPD - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 9073051

Matrix Spike Dup (9073051-MSD1)

Source: 19G1001-01

Prepared: 07/30/19

Analyzed: 08/09/19

Tributyltin	262	99.0	100	ug/kg	250	ND	105	45-139	0.6	30	
Dibutyltin	239	115	200	"	250	ND	96	0-165	1	30	
Monobutyltin	71.8	55.0	200	"	250	ND	29	0-140	16	30	J
Surrogate: Tripentyltin	267			"	250		107	65-132			
Surrogate: Tri-n-propyltin	265			"	250		106	65-140			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

EnviroMatrix  Analytical, Inc.

Notes and Definitions

- R-06 Sample dilution was necessary due to nature of the matrix.
- J Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
- ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
- NR Not Reported
- dry Sample results reported on a dry weight basis (if indicated in units column)
- RPD Relative Percent Difference
- MDL Method detection limit (indicated per client's request)

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Enviro Matrix Analytical, Inc.

AMERICAN ENVIRONMENTAL TESTING LABORATORY
2834 NORTH NAOMI ST. BURBANK, CALIFORNIA 91504 DHS # 1541 LACSD# 10161
TEL (800) 288-AETL (619) 845-8200 FAX (619) 845-8840 WWW.aetlab.com

19G1001

CHAIN OF CUSTODY RECORD
114778

COMPANY **AETL** PROJECT MANAGER *J. Jordan* AETL JOB No. _____ Page _____ of _____

COMPANY ADDRESS **2834 N. Naomi St, Burbank CA 91504** PHONE **(818) 845-8840**

PROJECT NAME _____ PROJECT # _____ FAX **(818) 845-8200**

SITE NAME _____ PO # **30941 sub**

AND ADDRESS _____

SAMPLE ID	LAB ID	DATE	TIME	MATRIX	CONTAINER NUMBER/SIZE	PRES.
99263.41		07/16/19	12:05	Soil	202 jar	X
99263.42						X
99263.43						X
99263.44						X
99263.45						X
99263.46						X
99263.47						X
99263.48						X
99263.49						X
99263.50						X

ANALYSIS REQUESTED		RECEIVED BY:		RELINQUISHED BY:	
		Signature:		Signature:	
		Printed Name:		Printed Name:	
		Date:		Date:	
		Time:		Time:	

SAMPLE RECEIPT - TO BE FILLED BY LABORATORY

RELINQUISHED BY SAMPLER: _____ Signature: _____ Printed Name: _____ Date: _____ Time: _____

TOTAL NUMBER OF CONTAINERS _____ PROPERLY COOLED Y / N / NA

CUSTODY SEALS Y / N / NA _____ SAMPLES INTACT Y / N / NA

RECEIVED IN GOOD COND. Y _____ SAMPLES ACCEPTED Y / N

TURN AROUND TIME DATA DELIVERABLE REQUIRED

NORMAL RUSH SAME DAY NEXT DAY 2 DAYS 3 DAYS

HARD COPY PDF GEOTRACKER (GLOBAL ID) OTHER (PLEASE SPECIFY)

RECEIVED BY: _____ Signature: *M. Walsky* Printed Name: *M. Walsky* Date: *7/29/19* Time: *13:03*

DISTRIBUTION: WHITE - Laboratory, CANARY - Laboratory, PINK - Project/Account Manager, YELLOW - Sampler/Originator 1303



Daniel A. Weis, R.E.H.S.
Advantage Environmental Consultants, LLC
145 Vallecitos De Oro, Suite 201
San Marcos, California 92069
Tel: 760-744-3363 / CELL Mobile - 760.275.9229
Fax: Fax - 760.744.3383
Email: dweis@aec-env.com

RE: 329 & 343 S Hwy 101 & 112-114, 120 & 128 Dahlia Dr, Solana Beach, CA

Work Order No.: 1907164 Rev: 3

Dear Daniel A. Weis, R.E.H.S.:

Torrent Laboratory, Inc. received 40 sample(s) on July 18, 2019 for the analyses presented in the following Report.

The 40 samples received were combined into two 20:1 point composites for analysis.

All data for associated QC met EPA or laboratory specification(s) except where noted in the case narrative.

Torrent Laboratory, Inc. is certified by the State of California, ELAP #1991. If you have any questions regarding these test results, please feel free to contact the Project Management Team at (408)263-5258; ext 204.

Patti L Sandrock
QA Officer

August 07, 2019

Date

Date: 8/7/2019

Client: Advantage Environmental Consultants, LLC

Project: 329 & 343 S Hwy 101 & 112-114, 120 & 128 Dahlia Dr, Solana Beach

Work Order: 1907164

CASE NARRATIVE

Unless otherwise indicated in the following narrative, no issues encountered with the receiving, preparation, analysis or reporting of the results associated with this work order.

Unless otherwise indicated in the following narrative, no results have been method and/or field blank corrected.

Reported results relate only to the items/samples tested by the laboratory.

This report shall not be reproduced, except in full, without the written approval of Torrent Analytical, Inc.

Results are reported on a dry weight basis.

A preliminary report was issued pending the 8290 (Dioxin/Furan) data and the subcontracted 1668 PCB congener data. This is a final report for analysis performed by Torrent,

Analytical Comments for 1668 PCB Congeners, Note: Analysis subcontracted to Dod ELAP approved laboratory Cape Fear Analytical. Sub-contract data will follow under separate cover.

Analytical Comments for method 8290, Dioxins and Furans in Soil, Note: WHO:2005 TEFs used for TEQ calculation

REVISIONS:

Report revised to include Total Dioxin values (only OCDD present in both samples). The TEQ is also reported although there is no contribution from 2,3,7,8-TCDD.

Rev 1 (8/8/19)

Report revised to include sub-contracted PCB congener data. Data appears as an attachment to the Torrent generated report.

Rev. 2 (8/15/19)



REVISIONS (continued):

Report revised to expand narrative in order to provide more detail regarding both sub-contracted samples and in-house sample analysis:

The sub contract report was annotated to include the client sample ID along with the laboratory ID used in the sub-contract documentation. The data was further annotated to include Total PCBs found for each client sample - the PQL used was the highest value PQL observed in the compound list. Where a concentration was found that was below the highest PQL value but above the nominal value for the compound detected, the Total PCB is flagged with a J qualifier to indicate the Total PCB concentration should be considered as estimated.

Sub-contract samples were shipped overnight to Cape Fear Analytical in a Styrofoam cooler enclosed in a cardboard shipping box. The sub-contract lab indicated that the samples were received slightly above the recommended temperature of $\leq 6^{\circ}\text{C}$. As the samples were refrigerated upon receipt, the probability of this discrepancy having any significant affect on the analytical results is extremely low.

The sub-contract report indicates that no samples required re-extraction, however, this relates only to re-extraction due to sample anomalies. No client samples required re-extraction due to matrix interference or surrogate recovery failure. However, according to the sub lab, the entire preparation batch was re-extracted due to a QC failure of the initially extracted Method Blank which is a standard corrective action procedure. All QC parameters have been met in the presented data. No case narrative on the part of the sub-lab is required.

Originally reported Pyrethroids did not include all of client requested compound. Although there was no evidence of any pyrethroid presence in either sample, the chromatograms were reviewed for those compounds not included in Torrent's standard list but requested by the client. Because these compounds are not included in the calibration, they are reported in this revision as TICs (Tentatively Identified Compounds). The Method Blank was also reviewed for presence of these additional compounds and none were found.

Rev 3 (8/16/19)



Sample Result Summary

Report prepared for: Daniel A. Weis, R.E.H.S.
 Advantage Environmental Consultants, LLC

Date Received: 07/18/19

Date Reported: 08/07/19

Composite B1-B3

1907164-041

<u>Parameters:</u>	<u>Analysis Method</u>	<u>DF</u>	<u>MDL</u>	<u>PQL</u>	<u>Results</u>	<u>Unit</u>
Moisture, Percent	ASTM D2216-90	1	0.050	0.050	5.64	%
Dry Weight Factor	ASTM D2216-90	1	1	1	1.06	%
OCDD	SW8290	1	0.94	2.1	2.87	pg/g
Total-Dioxins	SW8290	1	0.045	0.11	2.87	pg/g
Total-TEQ	SW8290	1			0.000300	pg/g

Composite B4-B8

1907164-042

<u>Parameters:</u>	<u>Analysis Method</u>	<u>DF</u>	<u>MDL</u>	<u>PQL</u>	<u>Results</u>	<u>Unit</u>
Moisture, Percent	ASTM D2216-90	1	0.050	0.050	4.73	%
Dry Weight Factor	ASTM D2216-90	1	1	1	1.05	%
OCDD	SW8290	1	0.93	2.1	3.99	pg/g
Total-Dioxins	SW8290	1	0.044	0.11	3.99	pg/g
Total-TEQ	SW8290	1			0.00120	pg/g



SAMPLE RESULTS

Report prepared for: Daniel A. Weis, R.E.H.S.
 Advantage Environmental Consultants, LLC

Date/Time Received: 07/18/19, 11:30 am
Date Reported: 08/07/19

Client Sample ID:	Composite B1-B3	Lab Sample ID:	1907164-041A
Project Name/Location:	329 & 343 S Hwy 101 & 112-114, 120 & 128	Sample Matrix:	Soil
Project Number:			
Date/Time Sampled:	07/16/19 /		
SDG:			

Prep Method: % Water-P	Prep Batch Date/Time: 7/24/19 09:05:00
Prep Batch ID: 1115295	Prep Analyst: SNARASIMHAN

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Moisture, Percent	ASTM D2216-90	1	0.050	0.050	5.64		%	07/25/19	10:00	SN	441211
Dry Weight Factor	ASTM D2216-90	1	1	1	1.06		-	07/25/19	10:00	SN	441211



SAMPLE RESULTS

Report prepared for: Daniel A. Weis, R.E.H.S.
 Advantage Environmental Consultants, LLC

Date/Time Received: 07/18/19, 11:30 am
Date Reported: 08/07/19

Client Sample ID:	Composite B1-B3	Lab Sample ID:	1907164-041A
Project Name/Location:	329 & 343 S Hwy 101 & 112-114, 120 & 128	Sample Matrix:	Soil
Project Number:			
Date/Time Sampled:	07/16/19 /		
SDG:			

Prep Method: 3546-Pyrethroids	Prep Batch Date/Time: 7/30/19 15:33:00
Prep Batch ID: 1115241	Prep Analyst: LIMBAT

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Allethrin	SW8270C SIM	2	2.12	10.6	ND		ug/Kg	08/03/19	19:02	MT	441304
Prallethrin	SW8270C SIM	2	2.12	10.6	ND		ug/Kg	08/03/19	19:02	MT	441304
Bifenthrin	SW8270C SIM	2	2.12	10.6	ND		ug/Kg	08/03/19	19:02	MT	441304
Danitol	SW8270C SIM	2	2.12	10.6	ND		ug/Kg	08/03/19	19:02	MT	441304
L-Cyhalothrin	SW8270C SIM	2	2.12	10.6	ND		ug/Kg	08/03/19	19:02	MT	441304
cis-Permethrin	SW8270C SIM	2	2.12	10.6	ND		ug/Kg	08/03/19	19:02	MT	441304
trans-Permethrin	SW8270C SIM	2	2.12	10.6	ND		ug/Kg	08/03/19	19:02	MT	441304
Sanmarton	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:02	MT	441304
Fluvalinate	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:02	MT	441304
Resmethrin	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:02	MT	441304
Bioresmethrin	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:02	MT	441304
Phenothrin	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:02	MT	441304
Tetramethrin	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:02	MT	441304
Tralomethrin	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:02	MT	441304

		Acceptance Limits							
Nitrobenzene-d5 (S)	SW8270C SIM	30 - 125	111	%	08/03/19	19:02	MT	441304	
2-Fluorobiphenyl (S)	SW8270C SIM	45 - 105	88.8	%	08/03/19	19:02	MT	441304	
p-Terphenyl-d14 (S)	SW8270C SIM	30 - 125	114	%	08/03/19	19:02	MT	441304	

NOTE: Sample diluted due to nature of the matrix (dark, viscous extract)



SAMPLE RESULTS

Report prepared for: Daniel A. Weis, R.E.H.S.
 Advantage Environmental Consultants, LLC

Date/Time Received: 07/18/19, 11:30 am
Date Reported: 08/07/19

Client Sample ID:	Composite B1-B3	Lab Sample ID:	1907164-041A
Project Name/Location:	329 & 343 S Hwy 101 & 112-114, 120 & 128	Sample Matrix:	Soil
Project Number:			
Date/Time Sampled:	07/16/19 /		
SDG:			

Prep Method: 3546-BNASIM	Prep Batch Date/Time: 7/30/19 15:32:00
Prep Batch ID: 1115240	Prep Analyst: LIMBAT

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
N-Nitrosodimethylamine	SW8270C	2	0.46	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Phenol	SW8270C	2	3.5	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Bis(2-chloroethyl) ether	SW8270C	2	1.1	107	ND		ug/Kg	07/31/19	13:25	MT	441209
2-Chlorophenol	SW8270C	2	2.4	214	ND		ug/Kg	07/31/19	13:25	MT	441209
1,3-Dichlorobenzene	SW8270C	2	1.1	107	ND		ug/Kg	07/31/19	13:25	MT	441209
1,4-Dichlorobenzene	SW8270C	2	2.3	107	ND		ug/Kg	07/31/19	13:25	MT	441209
1,2-Dichlorobenzene	SW8270C	2	1.1	107	ND		ug/Kg	07/31/19	13:25	MT	441209
2-Methylphenol (o-Cresol)	SW8270C	2	2.1	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Bis(2-chloroisopropyl)ether	SW8270C	2	1.1	107	ND		ug/Kg	07/31/19	13:25	MT	441209
3-/4-Methylphenol (p-/m-Cresol)	SW8270C	2	2.4	214	ND		ug/Kg	07/31/19	13:25	MT	441209
N-nitroso-di-n-propylamine	SW8270C	2	2.7	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Hexachloroethane	SW8270C	2	0.61	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Nitrobenzene	SW8270C	2	1.4	107	ND		ug/Kg	07/31/19	13:25	MT	441209
2-Nitrophenol	SW8270C	2	2.1	214	ND		ug/Kg	07/31/19	13:25	MT	441209
2,4-Dimethylphenol	SW8270C	2	2.6	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Bis(2-Chloroethoxy)methane	SW8270C	2	7.6	107	ND		ug/Kg	07/31/19	13:25	MT	441209
2,4-Dichlorophenol	SW8270C	2	0.76	214	ND		ug/Kg	07/31/19	13:25	MT	441209
1,2,4-Trichlorobenzene	SW8270C	2	1.1	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Naphthalene	SW8270C	2	0.61	107	ND		ug/Kg	07/31/19	13:25	MT	441209
4-Chloroaniline	SW8270C	2	1.1	214	ND		ug/Kg	07/31/19	13:25	MT	441209
2,6-Dichlorophenol	SW8270C	2	0.76	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Hexachloro-1,3-butadiene	SW8270C	2	0.76	107	ND		ug/Kg	07/31/19	13:25	MT	441209
4-Chloro-3-methylphenol	SW8270C	2	2.1	214	ND		ug/Kg	07/31/19	13:25	MT	441209
2-Methylnaphthalene	SW8270C	2	1.1	107	ND		ug/Kg	07/31/19	13:25	MT	441209
1-Methylnaphthalene	SW8270C	2	0.92	107	ND		ug/Kg	07/31/19	13:25	MT	441209
2,4,6-Trichlorophenol	SW8270C	2	1.4	214	ND		ug/Kg	07/31/19	13:25	MT	441209
2,4,5-Trichlorophenol	SW8270C	2	1.2	214	ND		ug/Kg	07/31/19	13:25	MT	441209
2-Chloronaphthalene	SW8270C	2	1.4	107	ND		ug/Kg	07/31/19	13:25	MT	441209
1,4-Dinitrobenzene	SW8270C	2	7.0	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Dimethyl phthalate	SW8270C	2	1.4	107	ND		ug/Kg	07/31/19	13:25	MT	441209
1,3-Dinitrobenzene	SW8270C	2	5.8	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Acenaphthylene	SW8270C	2	0.61	107	ND		ug/Kg	07/31/19	13:25	MT	441209
2,6-Dinitrotoluene	SW8270C	2	6.1	107	ND		ug/Kg	07/31/19	13:25	MT	441209
1,2-Dinitrobenzene	SW8270C	2	9.9	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Acenaphthene	SW8270C	2	0.61	107	ND		ug/Kg	07/31/19	13:25	MT	441209



SAMPLE RESULTS

Report prepared for: Daniel A. Weis, R.E.H.S.
 Advantage Environmental Consultants, LLC

Date/Time Received: 07/18/19, 11:30 am
Date Reported: 08/07/19

Client Sample ID:	Composite B1-B3	Lab Sample ID:	1907164-041A
Project Name/Location:	329 & 343 S Hwy 101 & 112-114, 120 & 128	Sample Matrix:	Soil
Project Number:			
Date/Time Sampled:	07/16/19 /		
SDG:			

Prep Method: 3546-BNASIM	Prep Batch Date/Time: 7/30/19 15:32:00
Prep Batch ID: 1115240	Prep Analyst: LIMBAT

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Dibenzofuran	SW8270C	2	1.2	107	ND		ug/Kg	07/31/19	13:25	MT	441209
2,4-Dinitrotoluene	SW8270C	2	5.0	107	ND		ug/Kg	07/31/19	13:25	MT	441209
2,3,5,6-Tetrachlorophenol	SW8270C	2	13	214	ND		ug/Kg	07/31/19	13:25	MT	441209
2,3,4,6-Tetrachlorophenol	SW8270C	2	14	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Diethylphthalate	SW8270C	2	3.7	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Fluorene	SW8270C	2	1.1	107	ND		ug/Kg	07/31/19	13:25	MT	441209
4-Chlorophenyl phenyl ether	SW8270C	2	1.4	107	ND		ug/Kg	07/31/19	13:25	MT	441209
4-Bromophenyl phenyl ether	SW8270C	2	0.76	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Hexachlorobenzene	SW8270C	2	0.76	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Pentachlorophenol	SW8270C	2	11	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Phenanthrene	SW8270C	2	0.76	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Anthracene	SW8270C	2	1.4	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Carbazole	SW8270C	2	2.0	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Di-n-butylphthalate	SW8270C	2	3.7	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Fluoranthene	SW8270C	2	0.0014	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Pyrene	SW8270C	2	1.2	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Benzyl butyl phthalate	SW8270C	2	2.6	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Benzo[a]anthracene	SW8270C	2	1.2	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Chrysene	SW8270C	2	1.1	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Bis(2-Ethylhexyl)phthalate	SW8270C	2	7.6	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Di-n-octyl phthalate	SW8270C	2	2.3	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Benzo[b]fluoranthene	SW8270C	2	1.2	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Benzo[k]fluoranthene	SW8270C	2	1.1	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Benzo[a]pyrene	SW8270C	2	1.2	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Indeno[1,2,3-cd]pyrene	SW8270C	2	1.7	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Dibenz[a,h]anthracene	SW8270C	2	1.5	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Benzo[g,h,i]perylene	SW8270C	2	1.5	107	ND		ug/Kg	07/31/19	13:25	MT	441209
Pyridine	SW8270C	2	3.8	214	ND		ug/Kg	07/31/19	13:25	MT	441209
Acceptance Limits											
2-Fluorophenol (S)	SW8270C		25 - 125		65.5		%	07/31/19	13:25	MT	441209
Phenol-d6 (S)	SW8270C		25 - 125		65.5		%	07/31/19	13:25	MT	441209
Nitrobenzene-d5 (S)	SW8270C		35 - 125		74.7		%	07/31/19	13:25	MT	441209
2-Fluorobiphenyl (S)	SW8270C		35 - 125		74.1		%	07/31/19	13:25	MT	441209
2,4,6-Tribromophenol (S)	SW8270C		25 - 125		65.9		%	07/31/19	13:25	MT	441209
p-Terphenyl-d14 (S)	SW8270C		35 - 125		85.8		%	07/31/19	13:25	MT	441209



SAMPLE RESULTS

Report prepared for: Daniel A. Weis, R.E.H.S.
 Advantage Environmental Consultants, LLC

Date/Time Received: 07/18/19, 11:30 am
Date Reported: 08/07/19

Client Sample ID:	Composite B1-B3	Lab Sample ID:	1907164-041A
Project Name/Location:	329 & 343 S Hwy 101 & 112-114, 120 & 128	Sample Matrix:	Soil
Project Number:			
Date/Time Sampled:	07/16/19 /		
SDG:			

		Acceptance Limits						
2-Fluorophenol (S)	SW8270C	25 - 125	65.5	%	07/31/19	13:25	MT	441209
Phenol-d6 (S)	SW8270C	25 - 125	65.5	%	07/31/19	13:25	MT	441209
Nitrobenzene-d5 (S)	SW8270C	35 - 125	74.7	%	07/31/19	13:25	MT	441209
2-Fluorobiphenyl (S)	SW8270C	35 - 125	74.1	%	07/31/19	13:25	MT	441209
2,4,6-Tribromophenol (S)	SW8270C	25 - 125	65.9	%	07/31/19	13:25	MT	441209
p-Terphenyl-d14 (S)	SW8270C	35 - 125	85.8	%	07/31/19	13:25	MT	441209

NOTE: Sample diluted due to nature of the matrix (dark, viscous extract)



SAMPLE RESULTS

Report prepared for: Daniel A. Weis, R.E.H.S.
 Advantage Environmental Consultants, LLC

Date/Time Received: 07/18/19, 11:30 am
Date Reported: 08/07/19

Client Sample ID:	Composite B1-B3	Lab Sample ID:	1907164-041A
Project Name/Location:	329 & 343 S Hwy 101 & 112-114, 120 & 128	Sample Matrix:	Soil
Project Number:			
Date/Time Sampled:	07/16/19 /		
SDG:			

Prep Method: TOC-S-P	Prep Batch Date/Time: 7/31/19	12:00:00
Prep Batch ID: 1115312	Prep Analyst:	BJAY

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Total Organic Carbon	A5310B	1	21	57	ND		mg/Kg	07/31/19	12:00	BJAY	441228

Prep Method: 8290S-P	Prep Batch Date/Time: 7/29/19	20:25:00
Prep Batch ID: 1115212	Prep Analyst:	LATZN
	Units:	pg/g

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
2378-TCDF	SW8290	1	0.047	0.11	ND		pg/g	08/03/19	11:35	MJ	441394
12378-PeCDF	SW8290	1	0.22	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
23478-PeCDF	SW8290	1	0.14	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
123478-HxCDF	SW8290	1	0.11	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
123678-HxCDF	SW8290	1	0.24	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
234678-HxCDF	SW8290	1	0.31	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
123789-HxCDF	SW8290	1	0.41	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
1234678-HpCDF	SW8290	1	0.39	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
1234789-HpCDF	SW8290	1	0.24	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
OCDF	SW8290	1	0.32	2.1	ND		pg/g	08/03/19	11:35	MJ	441394
2378-TCDD	SW8290	1	0.045	0.11	ND		pg/g	08/03/19	11:35	MJ	441394
12378-PeCDD	SW8290	1	0.24	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
123478-HxCDD	SW8290	1	0.20	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
123678-HxCDD	SW8290	1	0.28	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
123789-HxCDD	SW8290	1	0.69	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
1234678-HpCDD	SW8290	1	0.34	1.1	ND		pg/g	08/03/19	11:35	MJ	441394
OCDD	SW8290	1	0.94	2.1	2.87		pg/g	08/03/19	11:35	MJ	441394
Total-Dioxins	SW8290	1	0.045	0.11	2.87		pg/g	08/03/19	11:35	MJ	441394
Total-Furans	SW8290	1	0.047	0.11	ND		pg/g	08/03/19	11:35	MJ	441394
Total-TEQ	SW8290	1			0.000300		pg/g	08/03/19	11:35	MJ	441394
Acceptance Limits											
(LS) 13C-2378-TCDF	SW8290		25 - 150		72.1		%	08/03/19	11:35	MJ	441394
(LS) 13C-12378-PeCDF	SW8290		25 - 150		78.6		%	08/03/19	11:35	MJ	441394
(LS) 13C-23478-PeCDF	SW8290		25 - 150		81.4		%	08/03/19	11:35	MJ	441394
(LS) 13C-123478-HxCDF	SW8290		25 - 150		53.3		%	08/03/19	11:35	MJ	441394



Prep Method: 8290S-P	Prep Batch Date/Time: 7/29/19 20:25:00
Prep Batch ID: 1115212	Prep Analyst: LATZN
	Units: pg/g

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
(LS) 13C-123678-HxCDF	SW8290		25 - 150		58.1		%	08/03/19	11:35	MJ	441394
(LS) 13C-234678-HxCDF	SW8290		25 - 150		57.4		%	08/03/19	11:35	MJ	441394
(LS) 13C-123789-HxCDF	SW8290		25 - 150		50.1		%	08/03/19	11:35	MJ	441394
(LS) 13C-1234678-HpCDF	SW8290		25 - 150		52.7		%	08/03/19	11:35	MJ	441394
(LS) 13C-1234789-HpCDF	SW8290		25 - 150		68.7		%	08/03/19	11:35	MJ	441394
(LS) 13C-2378-TCDD	SW8290		25 - 150		97.6		%	08/03/19	11:35	MJ	441394
(LS) 13C-12378-PeCDD	SW8290		25 - 150		106		%	08/03/19	11:35	MJ	441394
(LS) 13C-123478-HxCDD	SW8290		25 - 150		65.5		%	08/03/19	11:35	MJ	441394
(LS) 13C-123678-HxCDD	SW8290		25 - 150		44.6		%	08/03/19	11:35	MJ	441394
(LS) 13C-1234678-HpCDD	SW8290		25 - 150		74.2		%	08/03/19	11:35	MJ	441394
(LS) 13C-OCDD	SW8290		25 - 150		63.4		%	08/03/19	11:35	MJ	441394
(CRS) 37CI-2378-TCDD	SW8290		40 - 135		84.0		%	08/03/19	11:35	MJ	441394



SAMPLE RESULTS

Report prepared for: Daniel A. Weis, R.E.H.S.
 Advantage Environmental Consultants, LLC

Date/Time Received: 07/18/19, 11:30 am
Date Reported: 08/07/19

Client Sample ID:	Composite B4-B8	Lab Sample ID:	1907164-042A
Project Name/Location:	329 & 343 S Hwy 101 & 112-114, 120 & 128	Sample Matrix:	Soil
Project Number:			
Date/Time Sampled:	07/16/19 /		
SDG:			

Prep Method: % Water-P	Prep Batch Date/Time: 7/24/19 09:05:00
Prep Batch ID: 1115295	Prep Analyst: SNARASIMHAN

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Moisture, Percent	ASTM D2216-90	1	0.050	0.050	4.73		%	07/25/19	10:00	SN	441211
Dry Weight Factor	ASTM D2216-90	1	1	1	1.05		-	07/25/19	10:00	SN	441211



SAMPLE RESULTS

Report prepared for: Daniel A. Weis, R.E.H.S.
Advantage Environmental Consultants, LLC

Date/Time Received: 07/18/19, 11:30 am
Date Reported: 08/07/19

Client Sample ID:	Composite B4-B8	Lab Sample ID:	1907164-042A
Project Name/Location:	329 & 343 S Hwy 101 & 112-114, 120 & 128	Sample Matrix:	Soil
Project Number:			
Date/Time Sampled:	07/16/19 /		
SDG:			

Prep Method: 3546-Pyrethroids	Prep Batch Date/Time: 7/30/19 15:33:00
Prep Batch ID: 1115241	Prep Analyst: LIMBAT

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Allethrin	SW8270C SIM	1	1.05	5.25	ND		ug/Kg	08/03/19	19:26	MT	441304
Prallethrin	SW8270C SIM	1	1.05	5.25	ND		ug/Kg	08/03/19	19:26	MT	441304
Bifenthrin	SW8270C SIM	1	1.05	5.25	ND		ug/Kg	08/03/19	19:26	MT	441304
Danitol	SW8270C SIM	1	1.05	5.25	ND		ug/Kg	08/03/19	19:26	MT	441304
L-Cyhalothrin	SW8270C SIM	1	1.05	5.25	ND		ug/Kg	08/03/19	19:26	MT	441304
cis-Permethrin	SW8270C SIM	1	1.05	5.25	ND		ug/Kg	08/03/19	19:26	MT	441304
trans-Permethrin	SW8270C SIM	1	1.05	5.25	ND		ug/Kg	08/03/19	19:26	MT	441304
Sanmarton	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:26	MT	441304
Fluvalinate	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:26	MT	441304
Resmethrin	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:26	MT	441304
Bioresmethrin	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:26	MT	441304
Phenothrin	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:26	MT	441304
Tetramethrin	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:26	MT	441304
Tralomethrin	SW8270C SIM	2	2.12	10.6	ND	TIC	ug/Kg	08/03/19	19:26	MT	441304
Acceptance Limits											
Nitrobenzene-d5 (S)	SW8270C SIM		30 - 125		89.0		%	08/03/19	19:26	MT	441304
2-Fluorobiphenyl (S)	SW8270C SIM		45 - 105		81.2		%	08/03/19	19:26	MT	441304
p-Terphenyl-d14 (S)	SW8270C SIM		30 - 125		96.4		%	08/03/19	19:26	MT	441304



SAMPLE RESULTS

Report prepared for: Daniel A. Weis, R.E.H.S.
 Advantage Environmental Consultants, LLC

Date/Time Received: 07/18/19, 11:30 am
Date Reported: 08/07/19

Client Sample ID:	Composite B4-B8	Lab Sample ID:	1907164-042A
Project Name/Location:	329 & 343 S Hwy 101 & 112-114, 120 & 128	Sample Matrix:	Soil
Project Number:			
Date/Time Sampled:	07/16/19 /		
SDG:			

Prep Method: 3546-BNASIM	Prep Batch Date/Time: 7/30/19 15:32:00
Prep Batch ID: 1115240	Prep Analyst: LIMBAT

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
N-Nitrosodimethylamine	SW8270C	1	0.23	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Phenol	SW8270C	1	1.7	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Bis(2-chloroethyl) ether	SW8270C	1	0.53	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
2-Chlorophenol	SW8270C	1	1.2	106	ND		ug/Kg	07/31/19	13:55	MT	441209
1,3-Dichlorobenzene	SW8270C	1	0.53	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
1,4-Dichlorobenzene	SW8270C	1	1.1	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
1,2-Dichlorobenzene	SW8270C	1	0.53	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
2-Methylphenol (o-Cresol)	SW8270C	1	1.1	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Bis(2-chloroisopropyl)ether	SW8270C	1	0.53	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
3-/4-Methylphenol (p-/m-Cresol)	SW8270C	1	1.2	106	ND		ug/Kg	07/31/19	13:55	MT	441209
N-nitroso-di-n-propylamine	SW8270C	1	1.4	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Hexachloroethane	SW8270C	1	0.30	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Nitrobenzene	SW8270C	1	0.68	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
2-Nitrophenol	SW8270C	1	1.1	106	ND		ug/Kg	07/31/19	13:55	MT	441209
2,4-Dimethylphenol	SW8270C	1	1.3	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Bis(2-Chloroethoxy)methane	SW8270C	1	3.8	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
2,4-Dichlorophenol	SW8270C	1	0.38	106	ND		ug/Kg	07/31/19	13:55	MT	441209
1,2,4-Trichlorobenzene	SW8270C	1	0.53	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Naphthalene	SW8270C	1	0.30	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
4-Chloroaniline	SW8270C	1	0.53	106	ND		ug/Kg	07/31/19	13:55	MT	441209
2,6-Dichlorophenol	SW8270C	1	0.38	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Hexachloro-1,3-butadiene	SW8270C	1	0.38	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
4-Chloro-3-methylphenol	SW8270C	1	1.1	106	ND		ug/Kg	07/31/19	13:55	MT	441209
2-Methylnaphthalene	SW8270C	1	0.53	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
1-Methylnaphthalene	SW8270C	1	0.45	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
2,4,6-Trichlorophenol	SW8270C	1	0.68	106	ND		ug/Kg	07/31/19	13:55	MT	441209
2,4,5-Trichlorophenol	SW8270C	1	0.60	106	ND		ug/Kg	07/31/19	13:55	MT	441209
2-Chloronaphthalene	SW8270C	1	0.68	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
1,4-Dinitrobenzene	SW8270C	1	3.5	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Dimethyl phthalate	SW8270C	1	0.68	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
1,3-Dinitrobenzene	SW8270C	1	2.9	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Acenaphthylene	SW8270C	1	0.30	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
2,6-Dinitrotoluene	SW8270C	1	3.0	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
1,2-Dinitrobenzene	SW8270C	1	4.9	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Acenaphthene	SW8270C	1	0.30	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209



SAMPLE RESULTS

Report prepared for: Daniel A. Weis, R.E.H.S.
 Advantage Environmental Consultants, LLC

Date/Time Received: 07/18/19, 11:30 am
Date Reported: 08/07/19

Client Sample ID:	Composite B4-B8	Lab Sample ID:	1907164-042A
Project Name/Location:	329 & 343 S Hwy 101 & 112-114, 120 & 128	Sample Matrix:	Soil
Project Number:			
Date/Time Sampled:	07/16/19 /		
SDG:			

Prep Method: 3546-BNASIM	Prep Batch Date/Time: 7/30/19 15:32:00
Prep Batch ID: 1115240	Prep Analyst: LIMBAT

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Dibenzofuran	SW8270C	1	0.60	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
2,4-Dinitrotoluene	SW8270C	1	2.5	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
2,3,5,6-Tetrachlorophenol	SW8270C	1	6.3	106	ND		ug/Kg	07/31/19	13:55	MT	441209
2,3,4,6-Tetrachlorophenol	SW8270C	1	7.0	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Diethylphthalate	SW8270C	1	1.8	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Fluorene	SW8270C	1	0.53	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
4-Chlorophenyl phenyl ether	SW8270C	1	0.68	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
4-Bromophenyl phenyl ether	SW8270C	1	0.38	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Hexachlorobenzene	SW8270C	1	0.38	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Pentachlorophenol	SW8270C	1	5.4	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Phenanthrene	SW8270C	1	0.38	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Anthracene	SW8270C	1	0.68	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Carbazole	SW8270C	1	0.98	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Di-n-butylphthalate	SW8270C	1	1.8	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Fluoranthene	SW8270C	1	0.00068	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Pyrene	SW8270C	1	0.60	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Benzyl butyl phthalate	SW8270C	1	1.3	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Benz[a]anthracene	SW8270C	1	0.60	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Chrysene	SW8270C	1	0.53	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Bis(2-Ethylhexyl)phthalate	SW8270C	1	3.8	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Di-n-octyl phthalate	SW8270C	1	1.1	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Benzo[b]fluoranthene	SW8270C	1	0.60	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Benzo[k]fluoranthene	SW8270C	1	0.53	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Benzo[a]pyrene	SW8270C	1	0.60	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Indeno[1,2,3-cd]pyrene	SW8270C	1	0.83	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Dibenz[a,h]anthracene	SW8270C	1	0.76	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Benzo[g,h,i]perylene	SW8270C	1	0.76	52.9	ND		ug/Kg	07/31/19	13:55	MT	441209
Pyridine	SW8270C	1	1.9	106	ND		ug/Kg	07/31/19	13:55	MT	441209
Acceptance Limits											
2-Fluorophenol (S)	SW8270C		25 - 125		52.2		%	07/31/19	13:55	MT	441209
Phenol-d6 (S)	SW8270C		25 - 125		52.2		%	07/31/19	13:55	MT	441209
Nitrobenzene-d5 (S)	SW8270C		35 - 125		72.5		%	07/31/19	13:55	MT	441209
2-Fluorobiphenyl (S)	SW8270C		35 - 125		69.4		%	07/31/19	13:55	MT	441209
2,4,6-Tribromophenol (S)	SW8270C		25 - 125		51.7		%	07/31/19	13:55	MT	441209
p-Terphenyl-d14 (S)	SW8270C		35 - 125		76.8		%	07/31/19	13:55	MT	441209



SAMPLE RESULTS

Report prepared for: Daniel A. Weis, R.E.H.S.
 Advantage Environmental Consultants, LLC

Date/Time Received: 07/18/19, 11:30 am
Date Reported: 08/07/19

Client Sample ID:	Composite B4-B8	Lab Sample ID:	1907164-042A
Project Name/Location:	329 & 343 S Hwy 101 & 112-114, 120 & 128	Sample Matrix:	Soil
Project Number:			
Date/Time Sampled:	07/16/19 /		
SDG:			

Prep Method: TOC-S-P	Prep Batch Date/Time: 7/31/19	12:00:00
Prep Batch ID: 1115312	Prep Analyst:	BJAY

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Total Organic Carbon	A5310B	1	21	57	ND		mg/Kg	07/31/19	12:00	BJAY	441228

Prep Method: 8290S-P	Prep Batch Date/Time: 7/29/19	20:25:00
Prep Batch ID: 1115212	Prep Analyst:	LATZN
	Units:	pg/g

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
2378-TCDF	SW8290	1	0.046	0.11	ND		pg/g	08/03/19	12:36	MJ	441394
12378-PeCDF	SW8290	1	0.22	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
23478-PeCDF	SW8290	1	0.14	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
123478-HxCDF	SW8290	1	0.11	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
123678-HxCDF	SW8290	1	0.24	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
234678-HxCDF	SW8290	1	0.31	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
123789-HxCDF	SW8290	1	0.40	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
1234678-HpCDF	SW8290	1	0.39	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
1234789-HpCDF	SW8290	1	0.24	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
OCDF	SW8290	1	0.31	2.1	ND		pg/g	08/03/19	12:36	MJ	441394
2378-TCDD	SW8290	1	0.044	0.11	ND		pg/g	08/03/19	12:36	MJ	441394
12378-PeCDD	SW8290	1	0.24	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
123478-HxCDD	SW8290	1	0.20	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
123678-HxCDD	SW8290	1	0.28	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
123789-HxCDD	SW8290	1	0.69	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
1234678-HpCDD	SW8290	1	0.33	1.1	ND		pg/g	08/03/19	12:36	MJ	441394
OCDD	SW8290	1	0.93	2.1	3.99		pg/g	08/03/19	12:36	MJ	441394
Total-Dioxins	SW8290	1	0.044	0.11	3.99		pg/g	08/03/19	12:36	MJ	441394
Total-Furans	SW8290	1	0.046	0.11	ND		pg/g	08/03/19	12:36	MJ	441394
Total-TEQ	SW8290	1			0.00120		pg/g	08/03/19	12:36	MJ	441394
Acceptance Limits											
(LS) 13C-2378-TCDF	SW8290		25 - 150		77.2		%	08/03/19	12:36	MJ	441394
(LS) 13C-12378-PeCDF	SW8290		25 - 150		79.3		%	08/03/19	12:36	MJ	441394
(LS) 13C-23478-PeCDF	SW8290		25 - 150		84.9		%	08/03/19	12:36	MJ	441394
(LS) 13C-123478-HxCDF	SW8290		25 - 150		60.2		%	08/03/19	12:36	MJ	441394



Prep Method: 8290S-P	Prep Batch Date/Time: 7/29/19 20:25:00
Prep Batch ID: 1115212	Prep Analyst: LATZN
	Units: pg/g

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
(LS) 13C-123678-HxCDF	SW8290		25 - 150		65.1		%	08/03/19	12:36	MJ	441394
(LS) 13C-234678-HxCDF	SW8290		25 - 150		65.9		%	08/03/19	12:36	MJ	441394
(LS) 13C-123789-HxCDF	SW8290		25 - 150		60.2		%	08/03/19	12:36	MJ	441394
(LS) 13C-1234678-HpCDF	SW8290		25 - 150		64.8		%	08/03/19	12:36	MJ	441394
(LS) 13C-1234789-HpCDF	SW8290		25 - 150		79.0		%	08/03/19	12:36	MJ	441394
(LS) 13C-2378-TCDD	SW8290		25 - 150		110		%	08/03/19	12:36	MJ	441394
(LS) 13C-12378-PeCDD	SW8290		25 - 150		114		%	08/03/19	12:36	MJ	441394
(LS) 13C-123478-HxCDD	SW8290		25 - 150		76.7		%	08/03/19	12:36	MJ	441394
(LS) 13C-123678-HxCDD	SW8290		25 - 150		61.3		%	08/03/19	12:36	MJ	441394
(LS) 13C-1234678-HpCDD	SW8290		25 - 150		87.8		%	08/03/19	12:36	MJ	441394
(LS) 13C-OCDD	SW8290		25 - 150		87.6		%	08/03/19	12:36	MJ	441394
(CRS) 37CI-2378-TCDD	SW8290		40 - 135		100		%	08/03/19	12:36	MJ	441394



MB Summary Report

Work Order:	1907164	Prep Method:	8290S-P	Prep Date:	07/29/19	Prep Batch:	1115212
Matrix:	Soil	Analytical Method:	SW8290	Analyzed Date:	7/30/2019	Analytical Batch:	441394
Units:	pg/g						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier	
2378-TCDF	0.044	0.10	ND		
12378-PeCDF	0.21	1.0	ND		
23478-PeCDF	0.14	1.0	ND		
123478-HxCDF	0.10	1.0	0.160		
123678-HxCDF	0.23	1.0	ND		
234678-HxCDF	0.30	1.0	ND		
123789-HxCDF	0.39	1.0	ND		
1234678-HpCDF	0.37	1.0	ND		
1234789-HpCDF	0.22	1.0	0.220		
OCDF	0.30	5.0	0.780		
2378-TCDD	0.042	0.10	ND		
12378-PeCDD	0.23	1.0	ND		
123478-HxCDD	0.19	1.0	ND		
123678-HxCDD	0.27	1.0	ND		
123789-HxCDD	0.65	1.0	ND		
1234678-HpCDD	0.32	1.0	ND		
OCDD	0.88	5.0	1.17		
Total-Dioxins	0.042	1.0	ND		
Total-Furans	0.044	0.10	ND		
OCDD			0.000		
(LS) 13C-2378-TCDF			51.1		
(LS) 13C-12378-PeCDF			49.5		
(LS) 13C-23478-PeCDF			69.7		
(LS) 13C-123478-HxCDF			53.8		
(LS) 13C-123678-HxCDF			58.8		
(LS) 13C-234678-HxCDF			59.7		
(LS) 13C-123789-HxCDF			54.0		
(LS) 13C-1234678-HpCDF			59.0		
(LS) 13C-1234789-HpCDF			68.3		
(LS) 13C-2378-TCDD			76.9		
(LS) 13C-12378-PeCDD			90.1		
(LS) 13C-123478-HxCDD			72.3		
(LS) 13C-123678-HxCDD			50.1		
(LS) 13C-1234678-HpCDD			75.3		
(LS) 13C-OCDD			68.7		
(CRS) 37Cl-2378-TCDD			85.2		



MB Summary Report

Work Order:	1907164	Prep Method:	3546-BNASIM	Prep Date:	07/30/19	Prep Batch:	1115240
Matrix:	Soil	Analytical Method:	SW8270C	Analyzed Date:	7/31/2019	Analytical Batch:	441209
Units:	ug/Kg						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier	
N-Nitrosodimethylamine	0.22	100	ND		
Phenol	1.7	100	ND		
Bis(2-chloroethyl) ether	0.50	50	ND		
2-Chlorophenol	1.2	100	ND		
1,3-Dichlorobenzene	0.50	50	ND		
1,4-Dichlorobenzene	1.1	50	ND		
1,2-Dichlorobenzene	0.50	50	ND		
2-Methylphenol (o-Cresol)	1.0	100	ND		
Bis(2-chloroisopropyl)ether	0.50	50	ND		
3-/4-Methylphenol (p-/m-Cresol)	1.2	100	ND		
N-nitroso-di-n-propylamine	1.3	100	ND		
Hexachloroethane	0.29	50	ND		
Nitrobenzene	0.65	50	ND		
2-Nitrophenol	1.0	100	ND		
2,4-Dimethylphenol	1.2	100	ND		
Bis(2-Chloroethoxy)methane	3.6	50	ND		
2,4-Dichlorophenol	0.36	100	ND		
1,2,4-Trichlorobenzene	0.50	50	ND		
Naphthalene	0.29	50	0.382	J	
4-Chloroaniline	0.50	100	ND		
2,6-Dichlorophenol	0.36	100	ND		
Hexachloro-1,3-butadiene	0.36	50	ND		
4-Chloro-3-methylphenol	1.0	100	ND		
2-Methylnaphthalene	0.50	50	ND		
1-Methylnaphthalene	0.43	50	ND		
2,4,6-Trichlorophenol	0.65	100	ND		
2,4,5-Trichlorophenol	0.58	100	ND		
2-Chloronaphthalene	0.65	50	ND		
1,4-Dinitrobenzene	3.3	100	ND		
Dimethyl phthalate	0.65	50	ND		
1,3-Dinitrobenzene	2.7	100	ND		
Acenaphthylene	0.29	50	ND		
2,6-Dinitrotoluene	2.9	50	ND		
1,2-Dinitrobenzene	4.7	100	ND		
Acenaphthene	0.29	50	ND		
Dibenzofuran	0.58	50	ND		
2,4-Dinitrotoluene	2.4	50	ND		
2,3,5,6-Tetrachlorophenol	6.0	100	ND		
2,3,4,6-Tetrachlorophenol	6.6	100	ND		
Diethylphthalate	1.7	50	ND		
Fluorene	0.50	50	ND		



MB Summary Report

Work Order:	1907164	Prep Method:	3546-BNASIM	Prep Date:	07/30/19	Prep Batch:	1115240
Matrix:	Soil	Analytical Method:	SW8270C	Analyzed Date:	7/31/2019	Analytical Batch:	441209
Units:	ug/Kg						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier	
4-Chlorophenyl phenyl ether	0.65	50	ND		
4-Bromophenyl phenyl ether	0.36	50	ND		
Hexachlorobenzene	0.36	50	ND		
Pentachlorophenol	5.2	100	ND		
Phenanthrene	0.36	50	ND		
Anthracene	0.65	50	ND		
Carbazole	0.94	100	ND		
Di-n-butylphthalate	1.7	50	ND		
Fluoranthene	0.65	50	ND		
Pyrene	0.58	50	ND		
Benzyl butyl phthalate	1.2	50	ND		
Benz[a]anthracene	0.58	50	0.680	J	
Chrysene	0.50	50	ND		
Bis(2-Ethylhexyl)phthalate	3.6	50	5.16	J	
Di-n-octyl phthalate	1.1	50	ND		
Benzo[b]fluoranthene	0.58	50	ND		
Benzo[k]fluoranthene	0.50	50	ND		
Benzo[a]pyrene	0.58	50	ND		
Indeno[1,2,3-cd]pyrene	0.79	50	ND		
Dibenz[a,h]anthracene	0.72	50	ND		
Benzo[g,h,i]perylene	0.72	50	ND		
Pyridine	1.8	100	ND		
2-Fluorophenol (S)			65.5		
Phenol-d6 (S)			62.2		
Nitrobenzene-d5 (S)			71.6		
2-Fluorobiphenyl (S)			66.8		
2,4,6-Tribromophenol (S)			66.9		
p-Terphenyl-d14 (S)			74.5		



MB Summary Report

Work Order:	1907164	Prep Method:	3546-Pyrethroids	Prep Date:	07/30/19	Prep Batch:	1115241
Matrix:	Soil	Analytical Method:	SW8270C SIM	Analyzed Date:	8/3/2019	Analytical Batch:	441304
Units:	ug/Kg						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Allethrin	1.00	5.00	ND	
Prallethrin	1.00	5.00	ND	
Bifenthrin	1.00	5.00	ND	
Danitol	1.00	5.00	ND	
L-Cyhalothrin	1.00	5.00	ND	
cis-Permethrin	1.00	5.00	ND	
trans-Permethrin	1.00	5.00	ND	
Sanmarton	1.00	5.00	ND	TIC
Fluvalinate	1.00	5.00	ND	TIC
Resmethrin	1.00	5.00	ND	TIC
Bioresmethrin	1.00	5.00	ND	TIC
Phenothrin	1.00	5.00	ND	TIC
Tetramethrin	1.00	5.00	ND	TIC
Tralomethrin	1.00	5.00	ND	TIC
Nitrobenzene-d5 (S)			89.1	
2-Fluorobiphenyl (S)			82.5	
p-Terphenyl-d14 (S)			102	

Work Order:	1907164	Prep Method:	% Water-P	Prep Date:	07/24/19	Prep Batch:	1115295
Matrix:	Soil	Analytical Method:	ASTM D2216-90	Analyzed Date:	7/25/2019	Analytical Batch:	441211
Units:	%						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Moisture, Percent	0.050	0.050	0.0500	

Work Order:	1907164	Prep Method:	TOC-S-P	Prep Date:	07/31/19	Prep Batch:	1115312
Matrix:	Soil	Analytical Method:	A5310B	Analyzed Date:	7/31/2019	Analytical Batch:	441228
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
Total Organic Carbon	20	54	ND	



LCS/LCSD Summary Report

Raw values are used in quality control assessment.

Work Order:	1907164	Prep Method:	8290S-P	Prep Date:	07/29/19	Prep Batch:	1115212
Matrix:	Soil	Analytical Method:	SW8290	Analyzed Date:	7/30/2019	Analytical Batch:	441394
Units:	pg/g						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
2378-TCDF	0.044	0.10	ND	10	88.5			70 - 130		
12378-PeCDF	0.21	1.0	ND	50	99.3			70 - 130		
23478-PeCDF	0.14	1.0	ND	50	101			70 - 130		
123478-HxCDF	0.10	1.0	0.160	50	111			70 - 130		
123678-HxCDF	0.23	1.0	ND	50	105			70 - 130		
234678-HxCDF	0.30	1.0	ND	50	106			70 - 130		
123789-HxCDF	0.39	1.0	ND	50	105			70 - 130		
1234678-HpCDF	0.37	1.0	ND	50	107			70 - 130		
1234789-HpCDF	0.22	1.0	0.220	50	108			70 - 130		
OCDF	0.30	5.0	0.780	100	93.5			70 - 130		
2378-TCDD	0.042	0.10	ND	10	74.5			70 - 130		
12378-PeCDD	0.23	1.0	ND	50	90.6			70 - 130		
123478-HxCDD	0.19	1.0	ND	50	95.8			70 - 130		
123678-HxCDD	0.27	1.0	ND	50	80.1			70 - 130		
123789-HxCDD	0.65	1.0	ND	50	113			70 - 130		
1234678-HpCDD	0.32	1.0	ND	50	96.7			70 - 130		
OCDD	0.88	5.0	1.17	100	92.7			40 - 135		
(LS) 13C-2378-TCDF				100	70.4			25 - 150		
(LS) 13C-12378-PeCDF				100	74.0			25 - 150		
(LS) 13C-23478-PeCDF				100	77.8			25 - 150		
(LS) 13C-123478-HxCDF				100	59.1			25 - 150		
(LS) 13C-123678-HxCDF				100	63.8			25 - 150		
(LS) 13C-234678-HxCDF				100	64.3			25 - 150		
(LS) 13C-123789-HxCDF				100	62.2			25 - 150		
(LS) 13C-1234678-HpCDF				100	63.0			25 - 150		
(LS) 13C-1234789-HpCDF				100	73.6			25 - 150		
(LS) 13C-2378-TCDD				100	103			25 - 150		
(LS) 13C-12378-PeCDD				100	100			25 - 150		
(LS) 13C-123478-HxCDD				100	79.8			25 - 150		
(LS) 13C-123678-HxCDD				100	58.0			25 - 150		
(LS) 13C-1234678-HpCDD				100	80.4			25 - 150		
(LS) 13C-OCDD				200	79.2			25 - 150		
(CRS) 37Cl-2378-TCDD				10	93.9			40 - 135		



LCS/LCSD Summary Report

Raw values are used in quality control assessment.

Work Order:	1907164	Prep Method:	3546-BNASIM	Prep Date:	07/30/19	Prep Batch:	1115240
Matrix:	Soil	Analytical Method:	SW8270C	Analyzed Date:	7/31/2019	Analytical Batch:	441209
Units:	ug/Kg						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Phenol	18	100	ND	800	70.9	65.2	8.26	40 - 100	30	
2-Chlorophenol	1.2	100	ND	800	76.2	73.4	3.84	45 - 105	30	
1,4-Dichlorobenzene	1.1	50	ND	400	72.2	71.7	0.694	35 - 105	30	
N-nitroso-di-n-propylamine	1.3	100	ND	800	83.0	75.9	8.97	40 - 115	30	
1,2,4-Trichlorobenzene	0.50	50	ND	400	70.7	71.8	1.40	45 - 110	30	
4-Chloro-3-methylphenol	1.0	100	ND	800	72.0	68.7	4.62	45 - 110	30	
Acenaphthene	0.29	50	ND	400	72.1	71.4	0.697	45 - 110	30	
2,4-Dinitrotoluene	2.4	50	ND	400	67.2	67.1	0.372	50 - 115	30	
Pentachlorophenol	5.2	100	ND	800	85.7	83.0	3.11	25 - 120	30	
Pyrene	0.58	50	ND	400	81.2	80.4	0.927	45 - 125	30	
2-Fluorophenol (S)				11100	75.6	71.9		25 - 125		
Phenol-d6 (S)				11100	76.2	71.2		25 - 125		
Nitrobenzene-d5 (S)				5560	82.0	79.3		35 - 125		
2-Fluorobiphenyl (S)				5560	74.3	72.0		35 - 125		
2,4,6-Tribromophenol (S)				11100	84.3	77.8		25 - 125		
p-Terphenyl-d14 (S)				5560	82.7	81.1		35 - 125		

Work Order:	1907164	Prep Method:	3546-Pyrethroids	Prep Date:	07/30/19	Prep Batch:	1115241
Matrix:	Soil	Analytical Method:	SW8270C SIM	Analyzed Date:	8/3/2019	Analytical Batch:	441304
Units:	ug/Kg						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Allethrin	1.00	5.00	ND	400	77.0	80.7	4.75	60 - 140	30	
Prallethrin	1.00	5.00	ND	400	67.5	69.1	2.20	60 - 140	30	
Bifenthrin	1.00	5.00	ND	400	82.1	84.8	3.30	60 - 140	30	
Danitol	1.00	5.00	ND	400	85.8	87.8	2.31	60 - 140	30	
L-Cyhalothrin	1.00	5.00	ND	400	73.5	74.2	1.02	60 - 140	30	
cis-Permethrin	1.00	5.00	ND	400	79.6	80.9	1.87	60 - 140	30	
trans-Permethrin	1.00	5.00	ND	400	85.1	89.9	5.71	60 - 140	30	
Nitrobenzene-d5 (S)				5600	89.3	90.1	0.557	35 - 100		
2-Fluorobiphenyl (S)				5600	83.8	83.7	0.597	45 - 105		
p-Terphenyl-d14 (S)				5600	97.1	99.8	3.05	30 - 125		



LCS/LCSD Summary Report

Raw values are used in quality control assessment.

Work Order:	1907164	Prep Method:	TOC-S-P	Prep Date:	07/31/19	Prep Batch:	1115312
Matrix:	Soil	Analytical Method:	SM5310B	Analyzed Date:	7/31/2019	Analytical Batch:	441228
Units:	mg/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
Total Organic Carbon	0.0010	0.0027	ND	267000	113	116	2.95	60 - 140	20	



Duplicate QC Summary Report

Work Order: 1907164	Prep Method: TOC-S-P	Prep Date: 7/31/2019	Prep Batch: 1115312
Matrix:	Analytical Method: A5310B	Analyzed Date: 07/31/19	Analytical Batch: 441228
Units:	Lab Sample ID: 1907164-041A-DUP-1115312		

Parameters	<u>MDL</u>	<u>PQL</u>	<u>Sample Result</u>	<u>Duplicate Result</u>	<u>% RPD</u>
Total Organic Carbon	21	57	0.000	ND	0.00



Laboratory Qualifiers and Definitions

DEFINITIONS:

Accuracy/Bias (% Recovery) - The closeness of agreement between an observed value and an accepted reference value.
Blank (Method/Preparation Blank) -MB/PB - An analyte-free matrix to which all reagents are added in the same volumes/proportions as used in sample processing. The method blank is used to document contamination resulting from the analytical process.
Duplicate - a field sample and/or laboratory QC sample prepared in duplicate following all of the same processes and procedures used on the original sample (sample duplicate, LCSD, MSD)
Laboratory Control Sample (LCS ad LCSD) - A known matrix spiked with compounds representative of the target analyte(s). This is used to document laboratory performance.
Matrix - the component or substrate that contains the analyte of interest (e.g., - groundwater, sediment, soil, waste water, etc)
Matrix Spike (MS/MSD) - Client sample spiked with identical concentrations of target analyte (s). The spiking occurs prior to the sample preparation and analysis. They are used to document the precision and bias of a method in a given sample matrix.
Method Detection Limit (MDL) - the minimum concentration of a substance that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero
Practical Quantitation Limit/Reporting Limit/Limit of Quantitation (PQL/RL/LOQ) - a laboratory determined value at 2 to 5 times above the MDL that can be reproduced in a manner that results in a 99% confidence level that the result is both accurate and precise. PQLs/RLs/LODs reflect all preparation factors and/or dilution factors that have been applied to the sample during the preparation and/or analytical processes.
Precision (%RPD) - The agreement among a set of replicate/duplicate measurements without regard to known value of the replicates
Surrogate (S) or (Surr) - An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are used in most organic analysis to demonstrate matrix compatibility with the chosen method of analysis
Tentatively Identified Compound (TIC) - A compound not contained within the analytical calibration standards but present in the GCMS library of defined compounds. When the library is searched for an unknown compound, it can frequently give a tentative identification to the compound based on retention time and primary and secondary ion match. TICs are reported as estimates and are candidates for further investigation.
Units: the unit of measure used to express the reported result - mg/L and mg/Kg (equivalent to PPM - parts per million in liquid and solid), ug/L and ug/Kg (equivalent to PPB - parts per billion in liquid and solid), ug/m3 , mg/m3 , ppbv and ppmv (all units of measure for reporting concentrations in air), % (equivalent to 10000 ppm or 1,000,000 ppb), ug/Wipe (concentration found on the surface of a single Wipe usually taken over a 100cm ² surface)

LABORATORY QUALIFIERS:

<p>B - Indicates when the analyte is found in the associated method or preparation blank</p> <p>D - Surrogate is not recoverable due to the necessary dilution of the sample</p> <p>E - Indicates the reportable value is outside of the calibration range of the instrument but within the linear range of the instrument (unless otherwise noted) Values reported with an E qualifier should be considered as estimated.</p> <p>H- Indicates that the recommended holding time for the analyte or compound has been exceeded</p> <p>J- Indicates a value between the method MDL and PQL and that the reported concentration should be considered as estimated rather the quantitative</p> <p>NA - Not Analyzed</p> <p>N/A - Not Applicable</p> <p>ND - Not Detected at a concentration greater than the PQL/RL or, if reported to the MDL, at greater than the MDL.</p> <p>NR - Not recoverable - a matrix spike concentration is not recoverable due to a concentration within the original sample that is greater than four times the spike concentration added</p> <p>R- The % RPD between a duplicate set of samples is outside of the absolute values established by laboratory control charts</p> <p>S- Spike recovery is outside of established method and/or laboratory control limits. Further explanation of the use of this qualifier should be included within a case narrative</p> <p>X -Used to indicate that a value based on pattern identification is within the pattern range but not typical of the pattern found in standards. Further explanation may or may not be provided within the sample footnote and/or the case narrative.</p>



Sample Receipt Checklist

Client Name: Advantage Environmental Consultants, LLC
Project Name: 329 & 343 S Hwy 101 & 112-114, 120 & 128 Dahlia Dr.,
Salinas, CA
Work Order No.: 1907164

Date and Time Received: 7/18/2019 11:30:00
Received By: Helena Ueng
Physically Logged By: Helena Ueng
Checklist Completed By: Helena Ueng
Carrier Name: GSO

Chain of Custody (COC) Information

Chain of custody present? Yes
Chain of custody signed when relinquished and received? Yes
Chain of custody agrees with sample labels? Yes
Custody seals intact on sample bottles? Not Present

Sample Receipt Information

Custody seals intact on shipping container/cooler? Not Present
Shipping Container/Cooler In Good Condition? Yes
Samples in proper container/bottle? Yes
Samples containers intact? Yes
Sufficient sample volume for indicated test? Yes

Sample Preservation and Hold Time (HT) Information

All samples received within holding time? Yes
Container/Temp Blank temperature in compliance? Yes Temperature: 6.0 °C
Water-VOA vials have zero headspace? No VOA vials submitted
Water-pH acceptable upon receipt? N/A
pH Checked by: N/A pH Adjusted by: N/A

Comments:



Login Summary Report

Client ID:	TL6306 Advantage Environmental Consultants, LLC	QC Level:	II
Project Name:	329 & 343 S Hwy 101 & 112-114, 120 & 128 Dahlia Dr, Solana Beach, CA	TAT Requested:	10 Day:10
Project # :		Date Received:	7/18/2019
Report Due Date:	8/9/2019	Time Received:	11:30 am

Comments:

Work Order # : **1907164**

<u>WO Sample ID</u>	<u>Client Sample ID</u>	<u>Collection Date/Time</u>	<u>Matrix</u>	<u>Scheduled Disposal</u>	<u>Sample On Hold</u>	<u>Test On Hold</u>	<u>Requested Tests</u>	<u>Subbed</u>
1907164-001A	B1-1	07/16/19	Soil	01/12/20			Composite	
1907164-002A	B1-5	07/16/19	Soil	01/12/20			Composite	
1907164-003A	B1-10	07/16/19	Soil	01/12/20			Composite	
1907164-004A	B1-15	07/16/19	Soil	01/12/20			Composite	
1907164-005A	B1-20	07/16/19	Soil	01/12/20			Composite	
1907164-006A	B2-1	07/16/19	Soil	01/12/20			Composite	
1907164-007A	B2-5	07/16/19	Soil	01/12/20			Composite	
1907164-008A	B2-10	07/16/19	Soil	01/12/20			Composite	
1907164-009A	B2-15	07/16/19	Soil	01/12/20			Composite	
1907164-010A	B2-20	07/16/19	Soil	01/12/20			Composite	
1907164-011A	B3-1	07/16/19	Soil	01/12/20			Composite	
1907164-012A	B3-5	07/16/19	Soil	01/12/20			Composite	
1907164-013A	B3-10	07/16/19	Soil	01/12/20			Composite	
1907164-014A	B3-15	07/16/19	Soil	01/12/20			Composite	
1907164-015A	B3-20	07/16/19	Soil	01/12/20			Composite	
1907164-016A	B4-1	07/16/19	Soil	01/12/20			Composite	
1907164-017A	B4-5	07/16/19	Soil	01/12/20			Composite	
1907164-018A	B4-10	07/16/19	Soil	01/12/20			Composite	
1907164-019A	B4-15	07/16/19	Soil	01/12/20			Composite	



Login Summary Report

Client ID:	TL6306 Advantage Environmental Consultants, LLC	QC Level:	II
Project Name:	329 & 343 S Hwy 101 & 112-114, 120 & 128 Dahlia Dr, Solana Beach, CA	TAT Requested:	10 Day:10
Project # :		Date Received:	7/18/2019
Report Due Date:	8/9/2019	Time Received:	11:30 am

Comments:

Work Order # : **1907164**

<u>WO Sample ID</u>	<u>Client Sample ID</u>	<u>Collection Date/Time</u>	<u>Matrix</u>	<u>Scheduled Disposal</u>	<u>Sample On Hold</u>	<u>Test On Hold</u>	<u>Requested Tests</u>	<u>Subbed</u>
1907164-020A	B4-20	07/16/19	Soil	01/12/20			Composite	
1907164-021A	B5-1	07/16/19	Soil	01/12/20			Composite	
1907164-022A	B5-5	07/16/19	Soil	01/12/20			Composite	
1907164-023A	B5-10	07/16/19	Soil	01/12/20			Composite	
1907164-024A	B5-15	07/16/19	Soil	01/12/20			Composite	
1907164-025A	B5-20	07/16/19	Soil	01/12/20			Composite	
1907164-026A	B6-1	07/16/19	Soil	01/12/20			Composite	
1907164-027A	B6-5	07/16/19	Soil	01/12/20			Composite	
1907164-028A	B6-10	07/16/19	Soil	01/12/20			Composite	
1907164-029A	B6-15	07/16/19	Soil	01/12/20			Composite	
1907164-030A	B6-20	07/16/19	Soil	01/12/20			Composite	
1907164-031A	B7-1	07/16/19	Soil	01/12/20			Composite	
1907164-032A	B7-5	07/16/19	Soil	01/12/20			Composite	
1907164-033A	B7-10	07/16/19	Soil	01/12/20			Composite	
1907164-034A	B7-15	07/16/19	Soil	01/12/20			Composite	
1907164-035A	B7-20	07/16/19	Soil	01/12/20			Composite	
1907164-036A	B8-1	07/16/19	Soil	01/12/20			Composite	
1907164-037A	B8-5	07/16/19	Soil	01/12/20			Composite	



Login Summary Report

Client ID:	TL6306 Advantage Environmental Consultants, LLC	QC Level:	II
Project Name:	329 & 343 S Hwy 101 & 112-114, 120 & 128 Dahlia Dr, Solana Beach, CA	TAT Requested:	10 Day:10
Project # :		Date Received:	7/18/2019
Report Due Date:	8/9/2019	Time Received:	11:30 am
Comments:			
Work Order # :	1907164		

<u>WO Sample ID</u>	<u>Client Sample ID</u>	<u>Collection Date/Time</u>	<u>Matrix</u>	<u>Scheduled Disposal</u>	<u>Sample On Hold</u>	<u>Test On Hold</u>	<u>Requested Tests</u>	<u>Subbed</u>
1907164-038A	B8-10	07/16/19	Soil	01/12/20			Composite	
1907164-039A	B8-15	07/16/19	Soil	01/12/20			Composite	
1907164-040A	B8-20	07/16/19	Soil	01/12/20			Composite	
1907164-041A	Composite B1-B3	07/16/19	Soil	01/12/20			PMOIST SUB_Misc_Soil Dioxins_8290_S Dry W Pyrethroids_S TOC_S_5310B(M) SVO_BNASIM Full	Yes
Sample Note: SVOCs-8270SIM; Dioxins-8290; Pyrethroids; TOC; % moisture **Report all data in Dry Weight**								
1907164-042A	Composite B4-B8	07/16/19	Soil	01/12/20			PMOIST SUB_Misc_Soil SVO_BNASIM Full TOC_S_5310B(M) Pyrethroids_S Dioxins_8290_S Dry W	Yes



483 Sinclair Frontage Road
 Milpitas, CA 95035
 Phone: 408.263.5258
 FAX: 408.263.8293
 www.torrentlab.com

CHAIN OF CUSTODY

• NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY •

LAB WORK ORDER NO
 1907164

Company Name: **Advantage Environmental Consultants, LLC (AEC)** Location of Sampling: 329 & 343 S Hwy 101 & 112-114, 120 & 128 Dahlia Dr
 Address: 145 Vallecitos De Oro, Ste. 201 Purpose: Solana Beach, CA
 City: San Marcos State: CA Zip Code: 92069 Special Instructions / Comments:
 Telephone: 760-744-3363 FAX: 760-744-3383 Please report all results in dry weight
 REPORT TO: Samantha Hopper/ Dan W. SAMPLER: Samantha Hopper P.O. #: 19-228SD EMAIL: Shopper@aec-env.com/ Dweis@aec-env.com

TURNAROUND TIME: 10 Work Days 3 Work Days Noon - Nxt Day
 7 Work Days 2 Work Days 2 - 8 Hours
 5 Work Days 1 Work Day Other

SAMPLE TYPE: Storm Water Air QC Level IV
 Waste Water Other EDF
 Ground Water Excel / EDD
 Soil

REPORT FORMAT: SVOC-low level -
 8270/8270SLM
 Dioxins & Furans
 8290
 PCB congeners
 11668
 Synthetic
 Pyrethroids
 Total Organic
 Carbon 9060

ANALYSIS REQUESTED

LAB ID	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	REMARKS
001A	B1-1	7-16-19	Soil	1	Acetate sleeve	
002A	B1-5					See Attachment
003A	B1-10					for Analysis
004A	B1-15					
005A	B1-20					
006A	B2-1					
007A	B2-5					
008A	B2-10					
009A	B2-15					
010A	B2-20					

1 Relinquished By: Samantha Hopper Print: Samantha Hopper Date: 7-17-19 Time: 11:00
 Received By: GSO Print: GSO Date: 7/18/19 Time: 11:30

2 Relinquished By: GSO Print: GSO Date: 7/18/19 Time: 11:30
 Received By: Hobbesley Print: Hobbesley Date: 7/18/19 Time: 11:30

Were Samples Received in Good Condition? Yes NO Samples on Ice? Yes NO Method of Shipment: GSO Sample seals intact? Yes NO N/A
 NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made.
 Log In By: _____ Date: _____ Log In Reviewed By: _____ Date: Temp=6°C #2 Page 1 of 4



483 Sinclair Frontage Road
 Milpitas, CA 95035
 Phone: 408.263.5258
 FAX: 408.263.8293
 www.torrentlab.com

CHAIN OF CUSTODY

LAB WORK ORDER NO

1907164

• NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY •

Company Name: Advantage Environmental Consultants, LLC (AEC)			Location of Sampling: 329 & 343 S Hwy 101 & 112-114, 120 & 128 Dahlia Dr		
Address: 145 Vallecitos De Oro, Ste. 201			Purpose: Solana Beach, CA		
City: San Marcos	State: CA	Zip Code: 92069	Special Instructions / Comments:		
Telephone: 760-744-3363 FAX: 760-744-3383			Please report all results in dry weight		
REPORT TO: Samantha Hopper/ Dan W. SAMPLER: Samantha Hopper			P.O. #: 19-228SD EMAIL: Shopper@aec-env.com/ Dweis@aec-env.com		

TURNAROUND TIME:		SAMPLE TYPE:		REPORT FORMAT:	
<input type="checkbox"/> 10 Work Days	<input type="checkbox"/> 3 Work Days	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Air	<input type="checkbox"/> QC Level IV	ANALYSIS REQUESTED SVOCs low-level 8270/8270 SIM Dioxins & Furans 8290 PCB Congeners 1668 Synthetic Pyrethroids Total Organic Carbon 9060
<input type="checkbox"/> 7 Work Days	<input type="checkbox"/> 2 Work Days	<input type="checkbox"/> Waste Water	<input type="checkbox"/> Other	<input type="checkbox"/> EDF	
<input checked="" type="checkbox"/> 5 Work Days	<input type="checkbox"/> 1 Work Day	<input type="checkbox"/> Ground Water	<input type="checkbox"/> Other	<input type="checkbox"/> Excel / EDD	
<input type="checkbox"/> Noon - Nxt Day	<input type="checkbox"/> 2 - 8 Hours	<input checked="" type="checkbox"/> Soil			

LAB ID	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	REMARKS
011A	B3-1	7-16-19	Soil	1	Acetate Sleeve	See Attachment for Analysis
012A	B3-5					
013A	B3-10					
014A	B3-15					
015A	B3-20					
016A	B3-1 B4-1					
017A	B4-5					
018A	B4-10					
019A	B4-15					
020A	B4-20					

1 Relinquished By: <i>Samantha Hopper</i>	Print: <i>Samantha Hopper</i>	Date: 7-17-19	Time: 11:00	Received By: <i>GSO</i>	Print: <i>GSO</i>	Date: 7-18-19	Time: 1:30
2 Relinquished By: <i>GSO</i>	Print: <i>GSO</i>	Date:	Time:	Received By: <i>Helena</i>	Print: <i>Helena</i>	Date: 7-18-19	Time: 1:30

Were Samples Received in Good Condition? Yes NO Samples on Ice? Yes NO Method of Shipment GSO Sample seals intact? Yes NO N/A

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made.

Log In By: _____ Date: _____ Log In Reviewed By: _____ Date: Temp = 6°C #2

Page 2 of 4



483 Sinclair Frontage Road
 Milpitas, CA 95035
 Phone: 408.263.5258
 FAX: 408.263.8293
 www.torrentlab.com

CHAIN OF CUSTODY

LAB WORK ORDER NO
 1907164

• NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY •

Company Name: Advantage Environmental Consultants, LLC (AEC)			Location of Sampling: 329 & 343 S Hwy 101 & 112-114, 120 & 128 Dahlia Dr		
Address: 145 Vallecitos De Oro, Ste. 201			Purpose: Solana Beach, CA		
City: San Marcos	State: CA	Zip Code: 92069	Special Instructions / Comments:		
Telephone: 760-744-3363 FAX: 760-744-3383			Please report all results in dry weight		
REPORT TO: Samantha Hopper/ Dan W. SAMPLER: Samantha Hopper			P.O. #: 19-228SD EMAIL: Shopper@aec-env.com/ Dweis@aec-env.com		

TURNAROUND TIME:		SAMPLE TYPE:		REPORT FORMAT:	
<input type="checkbox"/> 10 Work Days	<input type="checkbox"/> 3 Work Days	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Air	<input type="checkbox"/> QC Level IV	
<input type="checkbox"/> 7 Work Days	<input type="checkbox"/> 2 Work Days	<input type="checkbox"/> Waste Water	<input type="checkbox"/> Other	<input type="checkbox"/> EDF	
<input checked="" type="checkbox"/> 5 Work Days	<input type="checkbox"/> 1 Work Day	<input type="checkbox"/> Ground Water		<input type="checkbox"/> Excel / EDD	
	<input type="checkbox"/> Noon - Nxt Day	<input checked="" type="checkbox"/> Soil			
	<input type="checkbox"/> 2 - 8 Hours				

SVOCs low level
 8270/8270SIM
 Dioxins & Furans
 8290
 PCB Congeners
 1668
 Synthetic
 Pyrethroids
 Total organic
 Carbon 9060

ANALYSIS REQUESTED

LAB ID	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	REMARKS
021A	B5-1	7-16-19	Soil	1	Acetate Sleeve	See Attachment
022A	B5-5					for Analysis
023A	B5-10					
024A	B5-15					
025A	B5-20					
026A	B6-1					
027A	B6-5					
028A	B6-10					
029A	B6-15					
030A	B6-20					

1 Relinquished By: <i>Samantha Hopper</i>	Print: <i>Samantha Hopper</i>	Date: 7-17-19	Time: 11:00	Received By: <i>GSO</i>	Print: <i>GSO</i>	Date:	Time:
2 Relinquished By: <i>GSO</i>	Print: <i>GSO</i>	Date:	Time:	Received By: <i>Helenalleng</i>	Print: <i>Helenalleng</i>	Date: 7/18/19	Time: 11:30

Were Samples Received in Good Condition? Yes NO Samples on Ice? Yes NO Method of Shipment GSO Sample seals intact? Yes NO N/A

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made.

Log In By: _____ Date: _____ Log In Reviewed By: _____ Date: Temp=6°C #2

Page 3 of 4



483 Sinclair Frontage Road
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CHAIN OF CUSTODY

LAB WORK ORDER NO
 1907164

• NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY •

Company Name: Advantage Environmental Consultants, LLC (AEC)			Location of Sampling: 329 & 343 S Hwy 101 & 112-114, 120 & 128 Dahlia Dr		
Address: 145 Vallecitos De Oro, Ste. 201			Purpose: Solana Beach, CA		
City: San Marcos	State: CA	Zip Code: 92069	Special Instructions / Comments:		
Telephone: 760-744-3363 FAX: 760-744-3383			Please report all results in dry weight		
REPORT TO: Samantha Hopper/ Dan W. SAMPLER: Samantha Hopper			P.O. #: 19-228SD EMAIL: Shopper@aec-env.com/ Dweis@aec-env.com		

TURNAROUND TIME:		SAMPLE TYPE:		REPORT FORMAT:		ANALYSIS REQUESTED
<input type="checkbox"/> 10 Work Days	<input type="checkbox"/> 3 Work Days	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Air	<input type="checkbox"/> QC Level IV		
<input type="checkbox"/> 7 Work Days	<input type="checkbox"/> 2 Work Days	<input type="checkbox"/> Waste Water	<input type="checkbox"/> Other	<input type="checkbox"/> EDF		
<input checked="" type="checkbox"/> 5 Work Days	<input type="checkbox"/> 1 Work Day	<input type="checkbox"/> Ground Water	<input checked="" type="checkbox"/> Soil	<input type="checkbox"/> Excel / EDD		

LAB ID	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	REMARKS
031A	B7-1	7-16-19	Soil	1	Acetate Sleeve	See Attachment
032A	B7-5					for Analysis
033A	B7-10					
034A	B7-15					
035A	B7-20					
036A	B8-1					
037A	B8-5					
038A	B8-10					
039A	B8-15					
040A	B8-20					

1	Relinquished By: <i>Samantha Hopper</i>	Print: <i>Samantha Hopper</i>	Date: 7-17-19	Time: 11:00	Received By: <i>GSO</i>	Print: <i>GSO</i>	Date: 7/18/19	Time: 11:30
2	Relinquished By: <i>GSO</i>	Print: <i>GSO</i>	Date:	Time:	Received By: <i>Helen Alleng</i>	Print: <i>Helen Alleng</i>	Date:	Time:

Were Samples Received in Good Condition? Yes NO Samples on Ice? Yes NO Method of Shipment: GSO Sample seals intact? Yes NO N/A

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made.

Log In By: _____ Date: _____ Log In Reviewed By: _____ Date: Temp = 6°C #2

Page 4 of 4



1907164

Attachment

Composite B1-1, B1-5, B1-10, B1-15, B1-20, B2-1, B2-5, B2-10, B2-15, B2-20, B3-1, B3-5, B3-10, B3-15 and B3-20 and analyze for SVOCs – low level – 8270/8270SIM, Dioxins and Furans (EPA 8290), PCB Congeners (EPA 1668), Total Organic Carbon (EPA 9060) and Synthetic Pyrethroids

Composite B4-1, B4-5, B4-10, B4-15, B4-20, B5-1, B5-5, B5-10, B5-15, B5-20, B6-1, B6-5, B6-10, B6-15, B6-20, B7-1, B7-5, B7-10, B7-15, B7-20, B8-1, B8-5, B8-10, B8-15 and B8-20 and analyze for SVOCs – low level – 8270/8270SIM, Dioxins and Furans (EPA 8290), PCB Congeners (EPA 1668), Total Organic Carbon (EPA 9060) and Synthetic Pyrethroids

Please report all results in dry weight

August 15, 2019

Ms. Kathie Evans
Torrent Laboratory, Incorporated
483 Sinclair Frontage Road
Milpitas, California 95035

Re: PCB Subcontract 2019
Work Order: 15288
SDG: 1907164

Dear Ms. Evans:

Cape Fear Analytical LLC (CFA) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on July 25, 2019. This original data report has been prepared and reviewed in accordance with CFA's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at 910-795-0421.

Sincerely,



Cynde Larkins
Project Manager

Purchase Order: 1907164
Chain of Custody: 190722001
Enclosures

CFA NO# 15288

CHAIN OF CUSTODY

483 Sinclair Frontage Road
Milpitas, CA 95035
Phone: 408.263.5258
FAX: 408.263.8293
www.torrentlab.com



NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY

LAB WORK ORDER NO
CoC190722001

Company Name: Cape Fear Analytical	Company Name: Milpitas
Address: 3306 Kitty Hawk Rd Suite 120	Address: 483 Sinclair Frontage Road
City: Wilmington	City: Milpitas
State: North Carolina	State: CA
Zip Code: 28405	FAX: 408.263.8293
Telephone: 9107950421	Telephone: 408.263.5258
Contact Name: Sample Receiving	Contact: Kathie Evans
Special Instructions/Comments: * Pls analyze for attached list of PCB congeners on a standard 3 week TAT. Per Torrent's client request, data to be reported on a dry weight basis. Pls contact Torrent for % moisture data. Thanks!	Contact Email: pm@torrentlaboratory.com
P.O. #: 1907164	EMAIL:

TURNAROUND TIME: 10 Work Days 3 Work Days Noon-Nxt Day 7 Work Days 2 Work Days 2 - 8 Hours 5 Work Days 1 Work Days Other

SAMPLE TYPE: Soil

REPORT FORMAT: QC Level IV EDF Exce/VEDD

ANALYSIS REQUESTED

LAB ID	CLIENT'S SAMPLE I.D.	DATE/TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	REMARKS
	1907164-041A	7/16/2019/	Soil	1	40e jar X	SUB Misc. Soil PCB congeners (see list)
	1907164-042A	7/16/2019/	Soil	1	X	8.7°C 8.7°C

1 Relinquished By: <i>[Signature]</i>	Print: Helanaley	Date: 7/24/19	Time: 1300	Received By: FEDEX	Date: 7/25/19	Time: 10:04
2 Relinquished By: <i>[Signature]</i>	Print:	Date:	Time:	Received By: <i>[Signature]</i>	Date:	Time:

Were Samples Received in Good Condition? YES NO Samples on Ice? YES NO Method of Shipment

Sample seals intact? YES NO N/A

SAMPLE RECEIPT CHECKLIST
Cape Fear Analytical

Client: <u>Torrent</u>	Work Order: <u>15288</u>
Shipping Company: <u>Fedex</u>	Date/Time Received: <u>7/25/19 10:04</u>

Suspected Hazard Information	Yes	NA	No
Shipped as DOT Hazardous?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Samples identified as Foreign Soil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

DOE Site Sample Packages	Yes	NA	No*
Screened <0.5 mR/hr?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Samples < 2x background?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

* Notify RSO of any responses in this column immediately.

Air Sample Receipt Specifics	Yes	NA	No
Air sample in shipment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Air Witness: _____

#	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: seals broken damaged container leaking container other(describe)
2	Custody seal/s present on cooler?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Seal intact? Yes No
3	Chain of Custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Samples requiring cold preservation within 0-6°C?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Preservation Method: Temperature Blank present: Yes <u>No</u> ice bags <u>blue ice</u> / dry ice none other (describe) <u>8.4 + 0.3 = 8.7°</u> <u>Samples packed in cardboard box - not cooler</u>
5	Aqueous samples found to have visible solids?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample IDs, containers affected:
5	Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample IDs, containers affected and pH observed: If preservative added, Lot#:
7	Samples requiring preservation have no residual chlorine?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample IDs, containers affected: If preservative added, Lot#:
8	Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample IDs, tests affected:
9	Sample IDs on COC match IDs on containers?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample IDs, containers affected:
10	Date & time of COC match date & time on containers?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sample IDs, containers affected: <u>No time on COC vs sample labels</u>
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	List type and number of containers / Sample IDs, containers affected: <u>received 2-4oz clear</u>
12	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments:

Checklist performed by: Initials: MS Date: 7/25/19

PCB Congeners Analysis

Case Narrative

**PCBC Case Narrative
Torrent Laboratory, Incorporated (TORR)
SDG 1907164
Work Order 15288**

Method/Analysis Information

Product: Method 1668C HRMS Solid Analysis
Analytical Method: EPA Method 1668C
Extraction Method: SW846 3540C
Analytical Batch Number: 41373
Clean Up Batch Number: 41370
Extraction Batch Number: 41369

Sample Analysis

Samples were received at 8.7°C (15288001, 15288002). The client was notified of the temperature exceedance and the laboratory was instructed to proceed with analysis. The following samples were analyzed using the analytical protocol as established in EPA Method 1668C:

Sample ID	Client ID
12024441	Method Blank (MB)
12024442	Laboratory Control Sample (LCS)
12024443	Laboratory Control Sample Duplicate (LCSD)
12024444	15288001(1907164-041A) Matrix Spike (MS)
12024445	15288001(1907164-041A) Matrix Spike Duplicate (MSD)
15288001	1907164-041A
15288002	1907164-042A

The samples in this SDG were analyzed on a "dry weight" basis. Moisture content results were provided by the client.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by Cape Fear Analytical LLC (CFA) as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with CF-OA-E-003 REV# 7.

Raw data reports are processed and reviewed by the analyst using the TargetLynx software package.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Quality Control (QC) Information**Certification Statement**

The test results presented in this document are certified to meet all requirements of the 2009 TNI Standard.

Method Blank (MB) Statement

The MB(s) analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

All surrogate recoveries were within the established acceptance criteria for this SDG.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Laboratory Control Sample Duplicate (LCSD) Recovery

The LCSD spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement

The RPD(s) between the LCS and LCSD met the acceptance limits.

QC Sample Designation

Sample 15288001 (1907164-041A) was selected for analysis as the matrix spike and matrix spike duplicate.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD(s) between the MS and MSD met the acceptance limits.

Technical Information**Holding Time Specifications**

CFA assigns holding times based on the associated methodology, which assigns the date and time from sample collection. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of

expiration. All samples in this SDG met the specified holding time.

Sample Dilutions

Samples 12024444 (1907164-041A) and 12024445 (1907164-041A) were diluted due to the presence of non-target interferences.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Nonconformance (NCR) Documentation

A NCR was not required for this SDG.

Manual Integrations

Manual integrations were required for data files in this SDG. Certain standards and QC samples required manual integrations to correctly position the baseline as set in the calibration standard injections. Where manual integrations were performed, copies of all manual integration peak profiles are included in the raw data section of this fraction.

System Configuration

This analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
HRP875_1	PCB Analysis	PCB Analysis	SPB-Octyl	30m x 0.25mm, 0.25um

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted: Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Sample Data Summary

Cape Fear Analytical, LLC

3306 Kitty Hawk Road Suite 120, Wilmington, NC 28405 - (910) 795-0421 - www.capefearanalytical.com

Qualifier Definition Report for

TORR001 Torrent Laboratory, Incorporated
Client SDG: 1907164 CFA Work Order: 15288

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- C Congener has coeluters. When Cxxx, refer to congener number xxx for data
- J Value is estimated
- U Analyte was analyzed for, but not detected above the specified detection limit.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

Cape Fear Analytical requires all analytical data to be verified by a qualified data reviewer.

The following data validator verified the information presented in this case narrative:

Signature: 

Name: Heather Patterson

Date: 15 AUG 2019

Title: Group Leader

**PCB Congeners
Certificate of Analysis
Sample Summary**

Page 1 of 2

SDG Number: 1907164
Lab Sample ID: 15288001
Client Sample: 1668C Soil
Client ID: 1907164-041A (Comp B1-B3)
Batch ID: 41373
Run Date: 08/10/2019 03:05
Data File: d09aug19b-9
Prep Batch: 41369
Prep Date: 05-AUG-19

Client: TORR001
Date Collected: 07/16/2019 12:00
Date Received: 07/25/2019 10:04

Method: EPA Method 1668C
Analyst: CLP

Prep Method: SW846 3540C
Prep Aliquot: 12.29 g

Project: TORR00119
Matrix: SOIL
%Moisture: 5.6
Prep Basis: Dry Weight

Instrument: HRP875
Dilution: 1
Prep SOP Ref: CF-OA-E-001

CAS No.	Parmname	Qual	Result	Units	PQL
37680-65-2	PCB-018/030	CU	0.0172	ug/Kg	0.0172
38444-84-7	PCB-020/028	CU	0.0172	ug/Kg	0.0172
38444-90-5	PCB-037	U	0.00862	ug/Kg	0.00862
41464-39-5	PCB-044/065/047	CU	0.0259	ug/Kg	0.0259
41464-40-8	PCB-069/049	CU	0.0172	ug/Kg	0.0172
35693-99-3	PCB-052		0.0262	ug/Kg	0.00862
33284-53-6	PCB-061/076/070/074	CU	0.0345	ug/Kg	0.0345
32598-10-0	PCB-066	U	0.0172	ug/Kg	0.0172
32598-13-3	PCB-077		0.0147	ug/Kg	0.00862
70362-50-4	PCB-081	U	0.00862	ug/Kg	0.00862
55312-69-1	PCB-086/087/097/109/119/125	CU	0.0517	ug/Kg	0.0517
68194-07-0	PCB-113/090/101	CU	0.0259	ug/Kg	0.0259
38380-01-7	PCB-099	U	0.00862	ug/Kg	0.00862
32598-14-4	PCB-105	U	0.00862	ug/Kg	0.00862
38380-03-9	PCB-110/115	C	0.0291	ug/Kg	0.0172
74472-37-0	PCB-114	U	0.00862	ug/Kg	0.00862
31508-00-6	PCB-118		0.0161	ug/Kg	0.00862
65510-44-3	PCB-123	U	0.00862	ug/Kg	0.00862
57465-28-8	PCB-126	U	0.00862	ug/Kg	0.00862
38380-07-3	PCB-128/166	CU	0.0172	ug/Kg	0.0172
55215-18-4	PCB-138/163/129	C	0.0455	ug/Kg	0.0259
52744-13-5	PCB-151/135	CU	0.0172	ug/Kg	0.0172
68194-13-8	PCB-147/149	C	0.0219	ug/Kg	0.0172
35065-27-1	PCB-153/168	C	0.0216	ug/Kg	0.0172
38380-08-4	PCB-156/157	CU	0.0172	ug/Kg	0.0172
74472-42-7	PCB-158	U	0.00862	ug/Kg	0.00862
52663-72-6	PCB-167		0.00907	ug/Kg	0.00862
32774-16-6	PCB-169	U	0.00862	ug/Kg	0.00862
35065-30-6	PCB-170		0.0133	ug/Kg	0.00862
52663-70-4	PCB-177	U	0.00862	ug/Kg	0.00862
35065-29-3	PCB-193/180	C	0.0262	ug/Kg	0.0172
52663-69-1	PCB-183/185	CU	0.0172	ug/Kg	0.0172

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data
U Analyte was analyzed for, but not detected above the specified detection limit.

**PCB Congeners
Certificate of Analysis
Sample Summary**

SDG Number: 1907164	Client: TORR001	Project: TORR00119
Lab Sample ID: 15288001	Date Collected: 07/16/2019 12:00	Matrix: SOIL
Client Sample: 1668C Soil	Date Received: 07/25/2019 10:04	%Moisture: 5.6
Client ID: 1907164-041A (Comp B1-B3)		Prep Basis: Dry Weight
Batch ID: 41373	Method: EPA Method 1668C	
Run Date: 08/10/2019 03:05	Analyst: CLP	Instrument: HRP875
Data File: d09aug19b-9		Dilution: 1
Prep Batch: 41369	Prep Method: SW846 3540C	Prep SOP Ref: CF-OA-E-001
Prep Date: 05-AUG-19	Prep Aliquot: 12.29 g	

CAS No.	Parmname	Qual	Result	Units	PQL
52663-68-0	PCB-187		0.0127	ug/Kg	0.00862
39635-31-9	PCB-189	U	0.00862	ug/Kg	0.00862
35694-08-7	PCB-194	U	0.00862	ug/Kg	0.00862
40186-71-8	PCB-201	U	0.00862	ug/Kg	0.00862
40186-72-9	PCB-206	U	0.00862	ug/Kg	0.00862
PCB Total -			0.092	ug/Kg	0.0345

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-19-TrCB		0.113	0.172	ug/Kg	65.8	(5%-145%)
13C-37-TrCB		0.145	0.172	ug/Kg	83.9	(5%-145%)
13C-54-TeCB		0.132	0.172	ug/Kg	76.3	(5%-145%)
13C-77-TeCB		0.128	0.172	ug/Kg	74.4	(10%-145%)
13C-81-TeCB		0.132	0.172	ug/Kg	76.4	(10%-145%)
13C-104-PeCB		0.154	0.172	ug/Kg	89.1	(10%-145%)
13C-105-PeCB		0.139	0.172	ug/Kg	80.5	(10%-145%)
13C-114-PeCB		0.140	0.172	ug/Kg	81.2	(10%-145%)
13C-118-PeCB		0.138	0.172	ug/Kg	80.1	(10%-145%)
13C-123-PeCB		0.145	0.172	ug/Kg	83.9	(10%-145%)
13C-126-PeCB		0.135	0.172	ug/Kg	78.5	(10%-145%)
13C-155-HxCB		0.126	0.172	ug/Kg	73.0	(10%-145%)
13C-156-HxCB	C	0.253	0.345	ug/Kg	73.4	(10%-145%)
13C-167-HxCB		0.131	0.172	ug/Kg	76.1	(10%-145%)
13C-169-HxCB		0.135	0.172	ug/Kg	78.5	(10%-145%)
13C-188-HpCB		0.129	0.172	ug/Kg	75.0	(10%-145%)
13C-189-HpCB		0.136	0.172	ug/Kg	79.1	(10%-145%)
13C-202-OcCB		0.114	0.172	ug/Kg	65.9	(10%-145%)
13C-205-OcCB		0.152	0.172	ug/Kg	87.9	(10%-145%)
13C-206-NoCB		0.141	0.172	ug/Kg	81.8	(10%-145%)
13C-208-NoCB		0.132	0.172	ug/Kg	76.3	(10%-145%)
13C-28-TrCB		0.162	0.172	ug/Kg	94.2	(5%-145%)
13C-111-PeCB		0.152	0.172	ug/Kg	88.3	(10%-145%)
13C-178-HpCB		0.152	0.172	ug/Kg	87.9	(10%-145%)

Comments:

- C** Congener has coeluters. When Cxxx, refer to congener number xxx for data
- U** Analyte was analyzed for, but not detected above the specified detection limit.

**PCB Congeners
Certificate of Analysis
Sample Summary**

Page 1 of 2

SDG Number: 1907164
Lab Sample ID: 15288002
Client Sample: 1668C Soil
Client ID: 1907164-042A (Comp B4-B8)
Batch ID: 41373
Run Date: 08/10/2019 04:15
Data File: d09aug19b-10
Prep Batch: 41369
Prep Date: 05-AUG-19

Client: TORR001
Date Collected: 07/16/2019 12:00
Date Received: 07/25/2019 10:04

Method: EPA Method 1668C
Analyst: CLP

Prep Method: SW846 3540C
Prep Aliquot: 12.45 g

Project: TORR00119
Matrix: SOIL
%Moisture: 4.7
Prep Basis: Dry Weight

Instrument: HRP875
Dilution: 1
Prep SOP Ref: CF-OA-E-001

CAS No.	Parmname	Qual	Result	Units	PQL
37680-65-2	PCB-018/030	CU	0.0169	ug/Kg	0.0169
38444-84-7	PCB-020/028	CU	0.0169	ug/Kg	0.0169
38444-90-5	PCB-037	U	0.00843	ug/Kg	0.00843
41464-39-5	PCB-044/065/047	CU	0.0253	ug/Kg	0.0253
41464-40-8	PCB-069/049	CU	0.0169	ug/Kg	0.0169
35693-99-3	PCB-052		0.0091	ug/Kg	0.00843
33284-53-6	PCB-061/076/070/074	CU	0.0337	ug/Kg	0.0337
32598-10-0	PCB-066	U	0.0169	ug/Kg	0.0169
32598-13-3	PCB-077	U	0.00843	ug/Kg	0.00843
70362-50-4	PCB-081	U	0.00843	ug/Kg	0.00843
55312-69-1	PCB-086/087/097/109/119/125	CU	0.0506	ug/Kg	0.0506
68194-07-0	PCB-113/090/101	CU	0.0253	ug/Kg	0.0253
38380-01-7	PCB-099	U	0.00843	ug/Kg	0.00843
32598-14-4	PCB-105	U	0.00843	ug/Kg	0.00843
38380-03-9	PCB-110/115	CU	0.0169	ug/Kg	0.0169
74472-37-0	PCB-114	U	0.00843	ug/Kg	0.00843
31508-00-6	PCB-118	U	0.00843	ug/Kg	0.00843
65510-44-3	PCB-123	U	0.00843	ug/Kg	0.00843
57465-28-8	PCB-126	U	0.00843	ug/Kg	0.00843
38380-07-3	PCB-128/166	CU	0.0169	ug/Kg	0.0169
55215-18-4	PCB-138/163/129	CU	0.0253	ug/Kg	0.0253
52744-13-5	PCB-151/135	CU	0.0169	ug/Kg	0.0169
68194-13-8	PCB-147/149	CU	0.0169	ug/Kg	0.0169
35065-27-1	PCB-153/168	CU	0.0169	ug/Kg	0.0169
38380-08-4	PCB-156/157	CU	0.0169	ug/Kg	0.0169
74472-42-7	PCB-158	U	0.00843	ug/Kg	0.00843
52663-72-6	PCB-167	U	0.00843	ug/Kg	0.00843
32774-16-6	PCB-169	U	0.00843	ug/Kg	0.00843
35065-30-6	PCB-170	U	0.00843	ug/Kg	0.00843
52663-70-4	PCB-177	U	0.00843	ug/Kg	0.00843
35065-29-3	PCB-193/180	CU	0.0169	ug/Kg	0.0169
52663-69-1	PCB-183/185	CU	0.0169	ug/Kg	0.0169

Comments:

C Congener has coeluters. When Cxxx, refer to congener number xxx for data
U Analyte was analyzed for, but not detected above the specified detection limit.

**PCB Congeners
Certificate of Analysis
Sample Summary**

SDG Number: 1907164	Client: TORR001	Project: TORR00119
Lab Sample ID: 15288002	Date Collected: 07/16/2019 12:00	Matrix: SOIL
Client Sample: 1668C Soil	Date Received: 07/25/2019 10:04	%Moisture: 4.7
Client ID: 1907164-042A (Comp B4-B8)		Prep Basis: Dry Weight
Batch ID: 41373	Method: EPA Method 1668C	
Run Date: 08/10/2019 04:15	Analyst: CLP	Instrument: HRP875
Data File: d09aug19b-10		Dilution: 1
Prep Batch: 41369	Prep Method: SW846 3540C	Prep SOP Ref: CF-OA-E-001
Prep Date: 05-AUG-19	Prep Aliquot: 12.45 g	

CAS No.	Parmname	Qual	Result	Units	PQL
52663-68-0	PCB-187	U	0.00843	ug/Kg	0.00843
39635-31-9	PCB-189	U	0.00843	ug/Kg	0.00843
35694-08-7	PCB-194	U	0.00843	ug/Kg	0.00843
40186-71-8	PCB-201	U	0.00843	ug/Kg	0.00843
40186-72-9	PCB-206	U	0.00843	ug/Kg	0.00843

PCB Total -

0.0091 J ug/Kg 0.0345

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-19-TrCB		0.0346	0.169	ug/Kg	20.5	(5%-145%)
13C-37-TrCB		0.124	0.169	ug/Kg	73.8	(5%-145%)
13C-54-TeCB		0.0487	0.169	ug/Kg	28.9	(5%-145%)
13C-77-TeCB		0.120	0.169	ug/Kg	71.0	(10%-145%)
13C-81-TeCB		0.121	0.169	ug/Kg	71.5	(10%-145%)
13C-104-PeCB		0.0906	0.169	ug/Kg	53.7	(10%-145%)
13C-105-PeCB		0.132	0.169	ug/Kg	78.1	(10%-145%)
13C-114-PeCB		0.132	0.169	ug/Kg	78.3	(10%-145%)
13C-118-PeCB		0.128	0.169	ug/Kg	76.0	(10%-145%)
13C-123-PeCB		0.136	0.169	ug/Kg	80.5	(10%-145%)
13C-126-PeCB		0.128	0.169	ug/Kg	76.2	(10%-145%)
13C-155-HxCB		0.105	0.169	ug/Kg	62.0	(10%-145%)
13C-156-HxCB	C	0.272	0.337	ug/Kg	80.6	(10%-145%)
13C-167-HxCB		0.135	0.169	ug/Kg	80.2	(10%-145%)
13C-169-HxCB		0.128	0.169	ug/Kg	76.1	(10%-145%)
13C-188-HpCB		0.122	0.169	ug/Kg	72.2	(10%-145%)
13C-189-HpCB		0.128	0.169	ug/Kg	75.9	(10%-145%)
13C-202-OcCB		0.119	0.169	ug/Kg	70.7	(10%-145%)
13C-205-OcCB		0.145	0.169	ug/Kg	86.0	(10%-145%)
13C-206-NoCB		0.148	0.169	ug/Kg	87.5	(10%-145%)
13C-208-NoCB		0.134	0.169	ug/Kg	79.2	(10%-145%)
13C-28-TrCB		0.105	0.169	ug/Kg	62.2	(5%-145%)
13C-111-PeCB		0.126	0.169	ug/Kg	74.5	(10%-145%)
13C-178-HpCB		0.134	0.169	ug/Kg	79.5	(10%-145%)

Comments:

- C Congener has coeluters. When Cxxx, refer to congener number xxx for data**
- U Analyte was analyzed for, but not detected above the specified detection limit.**

- J Analyte was detected above the Nominal Detection Limit (MDL) but below the PQL**

Quality Control Summary

PCB Congeners
Surrogate Recovery Report

SDG Number: 1907164

Matrix Type: SOLID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
12024442	LCS for batch 41369	13C-19-TrCB		45.3	(15%-145%)
		13C-37-TrCB		78.0	(15%-145%)
		13C-54-TeCB		57.7	(15%-145%)
		13C-77-TeCB		74.9	(40%-145%)
		13C-81-TeCB		76.6	(40%-145%)
		13C-104-PeCB		74.4	(40%-145%)
		13C-105-PeCB		81.2	(40%-145%)
		13C-114-PeCB		81.6	(40%-145%)
		13C-118-PeCB		80.3	(40%-145%)
		13C-123-PeCB		85.6	(40%-145%)
		13C-126-PeCB		77.0	(40%-145%)
		13C-155-HxCB		72.9	(40%-145%)
		PCB-156L/157L	C	83.0	(40%-145%)
		13C-167-HxCB		84.4	(40%-145%)
		13C-169-HxCB		83.7	(40%-145%)
		13C-188-HpCB		78.5	(40%-145%)
		13C-189-HpCB		91.3	(40%-145%)
		13C-202-OcCB		69.2	(40%-145%)
		13C-205-OcCB		95.4	(40%-145%)
		13C-206-NoCB		87.0	(40%-145%)
13C-208-NoCB		78.8	(40%-145%)		
13C-28-TrCB		73.9	(15%-145%)		
13C-111-PeCB		77.6	(40%-145%)		
13C-178-HpCB		81.7	(40%-145%)		
12024443	LCSD for batch 41369	13C-19-TrCB		58.7	(15%-145%)
		13C-37-TrCB		89.8	(15%-145%)
		13C-54-TeCB		72.4	(15%-145%)
		13C-77-TeCB		80.1	(40%-145%)
		13C-81-TeCB		82.5	(40%-145%)
		13C-104-PeCB		88.9	(40%-145%)
		13C-105-PeCB		86.5	(40%-145%)
		13C-114-PeCB		87.3	(40%-145%)
		13C-118-PeCB		86.2	(40%-145%)
		13C-123-PeCB		91.2	(40%-145%)
		13C-126-PeCB		80.4	(40%-145%)
		13C-155-HxCB		82.2	(40%-145%)
		PCB-156L/157L	C	85.3	(40%-145%)
		13C-167-HxCB		87.4	(40%-145%)
		13C-169-HxCB		86.0	(40%-145%)
		13C-188-HpCB		84.5	(40%-145%)
		13C-189-HpCB		93.6	(40%-145%)
		13C-202-OcCB		74.0	(40%-145%)
		13C-205-OcCB		98.1	(40%-145%)
		13C-206-NoCB		89.2	(40%-145%)
13C-208-NoCB		81.1	(40%-145%)		
13C-28-TrCB		88.8	(15%-145%)		
13C-111-PeCB		81.8	(40%-145%)		
13C-178-HpCB		83.9	(40%-145%)		
12024441	MB for batch 41369	13C-19-TrCB		44.5	(5%-145%)
		13C-37-TrCB		76.0	(5%-145%)
		13C-54-TeCB		57.7	(5%-145%)

PCB Congeners
Surrogate Recovery Report

SDG Number: 1907164

Matrix Type: SOLID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
12024441	MB for batch 41369	13C-77-TeCB		68.3	(10%-145%)
		13C-81-TeCB		70.2	(10%-145%)
		13C-104-PeCB		74.7	(10%-145%)
		13C-105-PeCB		74.5	(10%-145%)
		13C-114-PeCB		76.0	(10%-145%)
		13C-118-PeCB		73.9	(10%-145%)
		13C-123-PeCB		79.0	(10%-145%)
		13C-126-PeCB		70.4	(10%-145%)
		13C-155-HxCB		71.7	(10%-145%)
		PCB-156L/157L	C	75.0	(10%-145%)
		13C-167-HxCB		77.8	(10%-145%)
		13C-169-HxCB		76.2	(10%-145%)
		13C-188-HpCB		74.5	(10%-145%)
		13C-189-HpCB		85.0	(10%-145%)
		13C-202-OcCB		64.6	(10%-145%)
		13C-205-OcCB		86.8	(10%-145%)
		13C-206-NoCB		79.5	(10%-145%)
		13C-208-NoCB		71.5	(10%-145%)
		13C-28-TrCB		79.2	(5%-145%)
		13C-111-PeCB		78.1	(10%-145%)
13C-178-HpCB		80.9	(10%-145%)		
12024444	1907164-041A(15288001MS)	13C-19-TrCB		68.1	D (5%-145%)
		13C-37-TrCB		101	D (5%-145%)
		13C-54-TeCB		81.2	D (5%-145%)
		13C-77-TeCB		83.9	D (10%-145%)
		13C-81-TeCB		88.4	D (10%-145%)
		13C-104-PeCB		85.9	D (10%-145%)
		13C-105-PeCB		84.4	D (10%-145%)
		13C-114-PeCB		86.9	D (10%-145%)
		13C-118-PeCB		83.4	D (10%-145%)
		13C-123-PeCB		87.7	D (10%-145%)
		13C-126-PeCB		77.4	D (10%-145%)
		13C-155-HxCB		83.0	D (10%-145%)
		PCB-156L/157L	C	74.0	D (10%-145%)
		13C-167-HxCB		76.6	D (10%-145%)
		13C-169-HxCB		74.2	D (10%-145%)
		13C-188-HpCB		90.5	D (10%-145%)
		13C-189-HpCB		86.7	D (10%-145%)
		13C-202-OcCB		75.8	D (10%-145%)
		13C-205-OcCB		90.6	D (10%-145%)
		13C-206-NoCB		94.3	D (10%-145%)
13C-208-NoCB		82.3	D (10%-145%)		
13C-28-TrCB		99.5	D (5%-145%)		
13C-111-PeCB		88.2	D (10%-145%)		
13C-178-HpCB		89.2	D (10%-145%)		
12024445	1907164-041A(15288001MSD)	13C-19-TrCB		70.0	D (5%-145%)
		13C-37-TrCB		99.7	D (5%-145%)
		13C-54-TeCB		84.5	D (5%-145%)
		13C-77-TeCB		84.8	D (10%-145%)
		13C-81-TeCB		88.5	D (10%-145%)
		13C-104-PeCB		92.5	D (10%-145%)

PCB Congeners
Surrogate Recovery Report

SDG Number: 1907164

Matrix Type: SOLID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
12024445	1907164-041A(15288001MSD)	13C-105-PeCB		89.8 D	(10%-145%)
		13C-114-PeCB		89.3 D	(10%-145%)
		13C-118-PeCB		91.8 D	(10%-145%)
		13C-123-PeCB		95.1 D	(10%-145%)
		13C-126-PeCB		85.7 D	(10%-145%)
		13C-155-HxCB		84.2 D	(10%-145%)
		PCB-156L/157L	C	83.1 D	(10%-145%)
		13C-167-HxCB		84.9 D	(10%-145%)
		13C-169-HxCB		83.7 D	(10%-145%)
		13C-188-HpCB		86.5 D	(10%-145%)
		13C-189-HpCB		91.7 D	(10%-145%)
		13C-202-OcCB		73.9 D	(10%-145%)
		13C-205-OcCB		98.8 D	(10%-145%)
		13C-206-NoCB		90.9 D	(10%-145%)
		13C-208-NoCB		84.2 D	(10%-145%)
		13C-28-TrCB		102 D	(5%-145%)
		13C-111-PeCB		91.3 D	(10%-145%)
		13C-178-HpCB		90.4 D	(10%-145%)
15288001	1907164-041A	13C-19-TrCB		65.8	(5%-145%)
		13C-37-TrCB		83.9	(5%-145%)
		13C-54-TeCB		76.3	(5%-145%)
		13C-77-TeCB		74.4	(10%-145%)
		13C-81-TeCB		76.4	(10%-145%)
		13C-104-PeCB		89.1	(10%-145%)
		13C-105-PeCB		80.5	(10%-145%)
		13C-114-PeCB		81.2	(10%-145%)
		13C-118-PeCB		80.1	(10%-145%)
		13C-123-PeCB		83.9	(10%-145%)
		13C-126-PeCB		78.5	(10%-145%)
		13C-155-HxCB		73.0	(10%-145%)
		PCB-156L/157L	C	73.4	(10%-145%)
		13C-167-HxCB		76.1	(10%-145%)
		13C-169-HxCB		78.5	(10%-145%)
		13C-188-HpCB		75.0	(10%-145%)
		13C-189-HpCB		79.1	(10%-145%)
		13C-202-OcCB		65.9	(10%-145%)
13C-205-OcCB		87.9	(10%-145%)		
13C-206-NoCB		81.8	(10%-145%)		
13C-208-NoCB		76.3	(10%-145%)		
13C-28-TrCB		94.2	(5%-145%)		
13C-111-PeCB		88.3	(10%-145%)		
13C-178-HpCB		87.9	(10%-145%)		
15288002	1907164-042A	13C-19-TrCB		20.5	(5%-145%)
		13C-37-TrCB		73.8	(5%-145%)
		13C-54-TeCB		28.9	(5%-145%)
		13C-77-TeCB		71.0	(10%-145%)
		13C-81-TeCB		71.5	(10%-145%)
		13C-104-PeCB		53.7	(10%-145%)
		13C-105-PeCB		78.1	(10%-145%)
		13C-114-PeCB		78.3	(10%-145%)
		13C-118-PeCB		76.0	(10%-145%)

PCB Congeners
Surrogate Recovery Report

SDG Number: 1907164

Matrix Type: SOLID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
15288002	1907164-042A	13C-123-PeCB		80.5	(10%-145%)
		13C-126-PeCB		76.2	(10%-145%)
		13C-155-HxCB		62.0	(10%-145%)
		PCB-156L/157L	C	80.6	(10%-145%)
		13C-167-HxCB		80.2	(10%-145%)
		13C-169-HxCB		76.1	(10%-145%)
		13C-188-HpCB		72.2	(10%-145%)
		13C-189-HpCB		75.9	(10%-145%)
		13C-202-OcCB		70.7	(10%-145%)
		13C-205-OcCB		86.0	(10%-145%)
		13C-206-NoCB		87.5	(10%-145%)
		13C-208-NoCB		79.2	(10%-145%)
		13C-28-TrCB		62.2	(5%-145%)
		13C-111-PeCB		74.5	(10%-145%)
		13C-178-HpCB		79.5	(10%-145%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

PCB Congeners

Page 1 of 2

**Quality Control Summary
Spike Recovery Report**

SDG Number: 1907164

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 41369

Matrix: SOIL

Lab Sample ID: 12024442

Instrument: HRP875

Analysis Date: 08/07/2019 18:21

Dilution: 1

Analyst: CLP

Prep Batch ID:41369

Batch ID: 41373

CAS No.	Parmname	Amount Added ug/Kg	Spike Conc. ug/Kg	Recovery %	Acceptance Limits
38444-73-4	LCS PCB-019	0.050	0.0575	115	60-135
38444-90-5	LCS PCB-037	0.050	0.0584	117	60-135
15968-05-5	LCS PCB-054	0.100	0.109	109	60-135
32598-13-3	LCS PCB-077	0.100	0.112	112	60-135
70362-50-4	LCS PCB-081	0.100	0.108	108	60-135
56558-16-8	LCS PCB-104	0.100	0.111	111	60-135
32598-14-4	LCS PCB-105	0.100	0.119	119	60-135
74472-37-0	LCS PCB-114	0.100	0.122	122	60-135
31508-00-6	LCS PCB-118	0.100	0.118	118	60-135
65510-44-3	LCS PCB-123	0.100	0.0992	99.2	60-135
57465-28-8	LCS PCB-126	0.100	0.122	122	60-135
33979-03-2	LCS PCB-155	0.100	0.120	120	60-135
38380-08-4	LCS PCB-156/157	0.200	C 0.237	119	60-135
52663-72-6	LCS PCB-167	0.100	0.120	120	60-135
32774-16-6	LCS PCB-169	0.100	0.117	117	60-135
74487-85-7	LCS PCB-188	0.100	0.108	108	60-135
39635-31-9	LCS PCB-189	0.100	0.115	115	60-135
2136-99-4	LCS PCB-202	0.150	0.165	110	60-135
74472-53-0	LCS PCB-205	0.150	0.152	101	60-135
40186-72-9	LCS PCB-206	0.150	0.151	101	60-135
52663-77-1	LCS PCB-208	0.150	0.174	116	60-135

PCB Congeners
Quality Control Summary
Spike Recovery Report

SDG Number: 1907164 **Sample Type:** Laboratory Control Sample Duplicate
Client ID: LCSD for batch 41369 **Matrix:** SOIL
Lab Sample ID: 12024443
Instrument: HRP875 **Analysis Date:** 08/07/2019 19:30 **Dilution:** 1
Analyst: CLP **Prep Batch ID:** 41369
Batch ID: 41373

CAS No.	Parmname	Amount Added ug/Kg	Spike Conc. ug/Kg	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
38444-73-4	LCSD PCB-019	0.050	0.0574	115	60-135	0.171	0-30
38444-90-5	LCSD PCB-037	0.050	0.0566	113	60-135	3.19	0-30
15968-05-5	LCSD PCB-054	0.100	0.106	106	60-135	2.23	0-30
32598-13-3	LCSD PCB-077	0.100	0.112	112	60-135	0.237	0-30
70362-50-4	LCSD PCB-081	0.100	0.107	107	60-135	0.770	0-30
56558-16-8	LCSD PCB-104	0.100	0.108	108	60-135	2.23	0-30
32598-14-4	LCSD PCB-105	0.100	0.118	118	60-135	0.848	0-30
74472-37-0	LCSD PCB-114	0.100	0.121	121	60-135	1.36	0-30
31508-00-6	LCSD PCB-118	0.100	0.117	117	60-135	0.853	0-30
65510-44-3	LCSD PCB-123	0.100	0.105	105	60-135	5.77	0-30
57465-28-8	LCSD PCB-126	0.100	0.121	121	60-135	0.0741	0-30
33979-03-2	LCSD PCB-155	0.100	0.118	118	60-135	1.40	0-30
38380-08-4	LCSD PCB-156/157	0.200	0.236	118	60-135	0.800	0-30
52663-72-6	LCSD PCB-167	0.100	0.120	120	60-135	0.188	0-30
32774-16-6	LCSD PCB-169	0.100	0.117	117	60-135	0.657	0-30
74487-85-7	LCSD PCB-188	0.100	0.108	108	60-135	0.716	0-30
39635-31-9	LCSD PCB-189	0.100	0.113	113	60-135	1.85	0-30
2136-99-4	LCSD PCB-202	0.150	0.163	109	60-135	1.25	0-30
74472-53-0	LCSD PCB-205	0.150	0.151	101	60-135	0.842	0-30
40186-72-9	LCSD PCB-206	0.150	0.149	99.4	60-135	1.24	0-30
52663-77-1	LCSD PCB-208	0.150	0.172	114	60-135	1.58	0-30

PCB Congeners
Quality Control Summary
Spike Recovery Report

SDG Number: 1907164
Client ID: 1907164-041A(15288001MS)
Lab Sample ID: 12024444
Instrument: HRP875
Analyst: CLP

Sample Type: Matrix Spike
Matrix: SOIL
%Moisture: 5.6
Analysis Date: 08/08/2019 01:18
Prep Batch ID: 41369
Batch ID: 41373
Dilution: 10

CAS No.	Parmname	Amount Added ug/Kg		Spike Conc. ug/Kg	Recovery %	Acceptance Limits
38444-73-4	MS PCB-019	0.0433	U	0.0506	117	50-150
38444-90-5	MS PCB-037	0.0433	U	0.0427	98.7	50-150
15968-05-5	MS PCB-054	0.0865	U	0.0979	113	50-150
32598-13-3	MS PCB-077	0.0865		0.104	103	50-150
70362-50-4	MS PCB-081	0.0865	U	0.090	104	50-150
56558-16-8	MS PCB-104	0.0865	U	0.110	127	50-150
32598-14-4	MS PCB-105	0.0865	U	0.118	136	50-150
74472-37-0	MS PCB-114	0.0865	U	0.108	125	50-150
31508-00-6	MS PCB-118	0.0865		0.133	135	50-150
65510-44-3	MS PCB-123	0.0865	U	0.089	103	50-150
57465-28-8	MS PCB-126	0.0865	U	0.115	133	50-150
33979-03-2	MS PCB-155	0.0865	U	0.107	123	50-150
38380-08-4	MS PCB-156/157	0.173	CU	0.232	134	50-150
52663-72-6	MS PCB-167	0.0865		0.113	120	50-150
32774-16-6	MS PCB-169	0.0865	U	0.106	123	50-150
74487-85-7	MS PCB-188	0.0865	U	0.0962	111	50-150
39635-31-9	MS PCB-189	0.0865	U	0.102	118	50-150
2136-99-4	MS PCB-202	0.130	U	0.149	115	50-150
74472-53-0	MS PCB-205	0.130	U	0.141	109	50-150
40186-72-9	MS PCB-206	0.130	U	0.138	106	50-150
52663-77-1	MS PCB-208	0.130	U	0.159	122	50-150

PCB Congeners
Quality Control Summary
Spike Recovery Report

SDG Number: 1907164	Sample Type: Matrix Spike Duplicate
Client ID: 1907164-041A(15288001MSD)	Matrix: SOIL
Lab Sample ID: 12024445	%Moisture: 5.6
Instrument: HRP875	Analysis Date: 08/08/2019 02:28
Analyst: CLP	Dilution: 10
	Prep Batch ID: 41369
	Batch ID: 41373

CAS No.	Parmname	Amount Added ug/Kg		Spike Conc. ug/Kg	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
38444-73-4	MSD PCB-019	0.0434	U	0.0503	116	50-150	0.710	0-35
38444-90-5	MSD PCB-037	0.0434	U	0.0466	108	50-150	8.82	0-35
15968-05-5	MSD PCB-054	0.0867	U	0.0939	108	50-150	4.14	0-35
32598-13-3	MSD PCB-077	0.0867		0.0934	90.8	50-150	10.7	0-35
70362-50-4	MSD PCB-081	0.0867	U	0.0904	104	50-150	0.528	0-35
56558-16-8	MSD PCB-104	0.0867	U	0.0984	113	50-150	11.2	0-35
32598-14-4	MSD PCB-105	0.0867	U	0.108	124	50-150	9.03	0-35
74472-37-0	MSD PCB-114	0.0867	U	0.102	118	50-150	5.49	0-35
31508-00-6	MSD PCB-118	0.0867		0.113	111	50-150	16.4	0-35
65510-44-3	MSD PCB-123	0.0867	U	0.0805	92.8	50-150	10.0	0-35
57465-28-8	MSD PCB-126	0.0867	U	0.101	116	50-150	13.1	0-35
33979-03-2	MSD PCB-155	0.0867	U	0.105	121	50-150	1.54	0-35
38380-08-4	MSD PCB-156/157	0.173	CU	0.205	118	50-150	12.3	0-35
52663-72-6	MSD PCB-167	0.0867		0.109	115	50-150	3.31	0-35
32774-16-6	MSD PCB-169	0.0867	U	0.101	116	50-150	5.21	0-35
74487-85-7	MSD PCB-188	0.0867	U	0.0934	108	50-150	2.90	0-35
39635-31-9	MSD PCB-189	0.0867	U	0.0997	115	50-150	2.18	0-35
2136-99-4	MSD PCB-202	0.130	U	0.144	110	50-150	3.71	0-35
74472-53-0	MSD PCB-205	0.130	U	0.129	99.1	50-150	8.84	0-35
40186-72-9	MSD PCB-206	0.130	U	0.137	105	50-150	0.801	0-35
52663-77-1	MSD PCB-208	0.130	U	0.152	117	50-150	3.99	0-35

Method Blank Summary

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SDG Number: 1907164
Client ID: MB for batch 41369
Lab Sample ID: 12024441
Column:

Client: TORR001
Instrument ID: HRP875
Prep Date: 05-AUG-19

Matrix: SOIL
Data File: d07aug19a-5
Analyzed: 08/07/19 20:40

This method blank applies to the following samples and quality control samples:

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 41369	12024442	d07aug19a-3	08/07/19	1821
02 LCSD for batch 41369	12024443	d07aug19a-4	08/07/19	1930
03 1907164-041A(15288001MS)	12024444	d07aug19a-9	08/08/19	0118
04 1907164-041A(15288001MSD)	12024445	d07aug19a-10	08/08/19	0228
05 1907164-041A	15288001	d09aug19b-9	08/10/19	0305
06 1907164-042A	15288002	d09aug19b-10	08/10/19	0415

**PCB Congeners
Certificate of Analysis
Sample Summary**

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SDG Number: 1907164	Client: TORR001	Project: TORR00119
Lab Sample ID: 12024441		Matrix: SOIL
Client Sample: QC for batch 41369		
Client ID: MB for batch 41369		Prep Basis: As Received
Batch ID: 41373	Method: EPA Method 1668C	
Run Date: 08/07/2019 20:40	Analyst: CLP	Instrument: HRP875
Data File: d07aug19a-5		Dilution: 1
Prep Batch: 41369	Prep Method: SW846 3540C	Prep SOP Ref: CF-OA-E-001
Prep Date: 05-AUG-19	Prep Aliquot: 10 g	

CAS No.	Parmname	Qual	Result	Units	PQL
37680-65-2	PCB-018/030	CU	0.02	ug/Kg	0.020
38444-84-7	PCB-020/028	CU	0.02	ug/Kg	0.020
38444-90-5	PCB-037	U	0.01	ug/Kg	0.010
41464-39-5	PCB-044/065/047	CU	0.03	ug/Kg	0.030
41464-40-8	PCB-069/049	CU	0.02	ug/Kg	0.020
35693-99-3	PCB-052	U	0.01	ug/Kg	0.010
33284-53-6	PCB-061/076/070/074	CU	0.04	ug/Kg	0.040
32598-10-0	PCB-066	U	0.02	ug/Kg	0.020
32598-13-3	PCB-077	U	0.01	ug/Kg	0.010
70362-50-4	PCB-081	U	0.01	ug/Kg	0.010
55312-69-1	PCB-086/087/097/109/119/125	CU	0.06	ug/Kg	0.060
68194-07-0	PCB-113/090/101	CU	0.03	ug/Kg	0.030
38380-01-7	PCB-099	U	0.01	ug/Kg	0.010
32598-14-4	PCB-105	U	0.01	ug/Kg	0.010
38380-03-9	PCB-110/115	CU	0.02	ug/Kg	0.020
74472-37-0	PCB-114	U	0.01	ug/Kg	0.010
31508-00-6	PCB-118	U	0.01	ug/Kg	0.010
65510-44-3	PCB-123	U	0.01	ug/Kg	0.010
57465-28-8	PCB-126	U	0.01	ug/Kg	0.010
38380-07-3	PCB-128/166	CU	0.02	ug/Kg	0.020
55215-18-4	PCB-138/163/129	CU	0.03	ug/Kg	0.030
52744-13-5	PCB-151/135	CU	0.02	ug/Kg	0.020
68194-13-8	PCB-147/149	CU	0.02	ug/Kg	0.020
35065-27-1	PCB-153/168	CU	0.02	ug/Kg	0.020
38380-08-4	PCB-156/157	CU	0.02	ug/Kg	0.020
74472-42-7	PCB-158	U	0.01	ug/Kg	0.010
52663-72-6	PCB-167	U	0.01	ug/Kg	0.010
32774-16-6	PCB-169	U	0.01	ug/Kg	0.010
35065-30-6	PCB-170	U	0.01	ug/Kg	0.010
52663-70-4	PCB-177	U	0.01	ug/Kg	0.010
35065-29-3	PCB-193/180	CU	0.02	ug/Kg	0.020
52663-69-1	PCB-183/185	CU	0.02	ug/Kg	0.020

Comments:

- C** Congener has coeluters. When Cxxx, refer to congener number xxx for data
J Value is estimated
U Analyte was analyzed for, but not detected above the specified detection limit.

**PCB Congeners
Certificate of Analysis
Sample Summary**

Page 2 of 2

SDG Number: 1907164	Client: TORR001	Project: TORR00119
Lab Sample ID: 12024441		Matrix: SOIL
Client Sample: QC for batch 41369		
Client ID: MB for batch 41369		Prep Basis: As Received
Batch ID: 41373	Method: EPA Method 1668C	
Run Date: 08/07/2019 20:40	Analyst: CLP	Instrument: HRP875
Data File: d07aug19a-5		Dilution: 1
Prep Batch: 41369	Prep Method: SW846 3540C	Prep SOP Ref: CF-OA-E-001
Prep Date: 05-AUG-19	Prep Aliquot: 10 g	

CAS No.	Parmname	Qual	Result	Units	PQL
52663-68-0	PCB-187	U	0.01	ug/Kg	0.010
39635-31-9	PCB-189	U	0.01	ug/Kg	0.010
35694-08-7	PCB-194	U	0.01	ug/Kg	0.010
40186-71-8	PCB-201	U	0.01	ug/Kg	0.010
40186-72-9	PCB-206	U	0.01	ug/Kg	0.010

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-19-TrCB		0.089	0.200	ug/Kg	44.5	(5%-145%)
13C-37-TrCB		0.152	0.200	ug/Kg	76.0	(5%-145%)
13C-54-TeCB		0.115	0.200	ug/Kg	57.7	(5%-145%)
13C-77-TeCB		0.137	0.200	ug/Kg	68.3	(10%-145%)
13C-81-TeCB		0.140	0.200	ug/Kg	70.2	(10%-145%)
13C-104-PeCB		0.149	0.200	ug/Kg	74.7	(10%-145%)
13C-105-PeCB		0.149	0.200	ug/Kg	74.5	(10%-145%)
13C-114-PeCB		0.152	0.200	ug/Kg	76.0	(10%-145%)
13C-118-PeCB		0.148	0.200	ug/Kg	73.9	(10%-145%)
13C-123-PeCB		0.158	0.200	ug/Kg	79.0	(10%-145%)
13C-126-PeCB		0.141	0.200	ug/Kg	70.4	(10%-145%)
13C-155-HxCB		0.143	0.200	ug/Kg	71.7	(10%-145%)
13C-156-HxCB	C	0.300	0.400	ug/Kg	75.0	(10%-145%)
13C-167-HxCB		0.156	0.200	ug/Kg	77.8	(10%-145%)
13C-169-HxCB		0.152	0.200	ug/Kg	76.2	(10%-145%)
13C-188-HpCB		0.149	0.200	ug/Kg	74.5	(10%-145%)
13C-189-HpCB		0.170	0.200	ug/Kg	85.0	(10%-145%)
13C-202-OcCB		0.129	0.200	ug/Kg	64.6	(10%-145%)
13C-205-OcCB		0.174	0.200	ug/Kg	86.8	(10%-145%)
13C-206-NoCB		0.159	0.200	ug/Kg	79.5	(10%-145%)
13C-208-NoCB		0.143	0.200	ug/Kg	71.5	(10%-145%)
13C-28-TrCB		0.158	0.200	ug/Kg	79.2	(5%-145%)
13C-111-PeCB		0.156	0.200	ug/Kg	78.1	(10%-145%)
13C-178-HpCB		0.162	0.200	ug/Kg	80.9	(10%-145%)

Comments:

- C** Congener has coeluters. When Cxxx, refer to congener number xxx for data
- J** Value is estimated
- U** Analyte was analyzed for, but not detected above the specified detection limit.

**PCB Congeners
Certificate of Analysis
Sample Summary**

SDG Number: 1907164	Client: TORR001	Project: TORR00119
Lab Sample ID: 12024442		Matrix: SOIL
Client Sample: QC for batch 41369		
Client ID: LCS for batch 41369		Prep Basis: As Received
Batch ID: 41373	Method: EPA Method 1668C	
Run Date: 08/07/2019 18:21	Analyst: CLP	Instrument: HRP875
Data File: d07aug19a-3		Dilution: 1
Prep Batch: 41369	Prep Method: SW846 3540C	Prep SOP Ref: CF-OA-E-001
Prep Date: 05-AUG-19	Prep Aliquot: 10 g	

CAS No.	Parmname	Qual	Result	Units	PQL
38444-73-4	PCB-019		0.0575	ug/Kg	0.010
38444-90-5	PCB-037		0.0584	ug/Kg	0.010
15968-05-5	PCB-054		0.109	ug/Kg	0.010
32598-13-3	PCB-077		0.112	ug/Kg	0.010
70362-50-4	PCB-081		0.108	ug/Kg	0.010
56558-16-8	PCB-104		0.111	ug/Kg	0.020
32598-14-4	PCB-105		0.119	ug/Kg	0.010
74472-37-0	PCB-114		0.122	ug/Kg	0.010
31508-00-6	PCB-118		0.118	ug/Kg	0.010
65510-44-3	PCB-123		0.0992	ug/Kg	0.010
57465-28-8	PCB-126		0.122	ug/Kg	0.010
33979-03-2	PCB-155		0.120	ug/Kg	0.010
38380-08-4	PCB-156/157	C	0.237	ug/Kg	0.020
52663-72-6	PCB-167		0.120	ug/Kg	0.010
32774-16-6	PCB-169		0.117	ug/Kg	0.010
74487-85-7	PCB-188		0.108	ug/Kg	0.010
39635-31-9	PCB-189		0.115	ug/Kg	0.010
2136-99-4	PCB-202		0.165	ug/Kg	0.010
74472-53-0	PCB-205		0.152	ug/Kg	0.010
40186-72-9	PCB-206		0.151	ug/Kg	0.010
52663-77-1	PCB-208		0.174	ug/Kg	0.010

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-19-TrCB		0.0906	0.200	ug/Kg	45.3	(15%-145%)
13C-37-TrCB		0.156	0.200	ug/Kg	78.0	(15%-145%)
13C-54-TeCB		0.115	0.200	ug/Kg	57.7	(15%-145%)
13C-77-TeCB		0.150	0.200	ug/Kg	74.9	(40%-145%)
13C-81-TeCB		0.153	0.200	ug/Kg	76.6	(40%-145%)
13C-104-PeCB		0.149	0.200	ug/Kg	74.4	(40%-145%)
13C-105-PeCB		0.162	0.200	ug/Kg	81.2	(40%-145%)
13C-114-PeCB		0.163	0.200	ug/Kg	81.6	(40%-145%)
13C-118-PeCB		0.161	0.200	ug/Kg	80.3	(40%-145%)
13C-123-PeCB		0.171	0.200	ug/Kg	85.6	(40%-145%)
13C-126-PeCB		0.154	0.200	ug/Kg	77.0	(40%-145%)
13C-155-HxCB		0.146	0.200	ug/Kg	72.9	(40%-145%)
13C-156-HxCB	C	0.332	0.400	ug/Kg	83.0	(40%-145%)
13C-167-HxCB		0.169	0.200	ug/Kg	84.4	(40%-145%)
13C-169-HxCB		0.167	0.200	ug/Kg	83.7	(40%-145%)
13C-188-HpCB		0.157	0.200	ug/Kg	78.5	(40%-145%)
13C-189-HpCB		0.183	0.200	ug/Kg	91.3	(40%-145%)
13C-202-OcCB		0.138	0.200	ug/Kg	69.2	(40%-145%)
13C-205-OcCB		0.191	0.200	ug/Kg	95.4	(40%-145%)

**PCB Congeners
Certificate of Analysis
Sample Summary**

SDG Number: 1907164	Client: TORR001	Project: TORR00119
Lab Sample ID: 12024442		Matrix: SOIL
Client Sample: QC for batch 41369		
Client ID: LCS for batch 41369		Prep Basis: As Received
Batch ID: 41373	Method: EPA Method 1668C	
Run Date: 08/07/2019 18:21	Analyst: CLP	Instrument: HRP875
Data File: d07aug19a-3		Dilution: 1
Prep Batch: 41369	Prep Method: SW846 3540C	Prep SOP Ref: CF-OA-E-001
Prep Date: 05-AUG-19	Prep Aliquot: 10 g	

CAS No.	Parmname	Qual	Result	Units	Recovery%	PQL
Surrogate/Tracer recovery						
13C-206-NoCB		Qual	Result	Nominal	Units	Acceptable Limits
			0.174	0.200	ug/Kg	87.0 (40%-145%)
13C-208-NoCB			0.158	0.200	ug/Kg	78.8 (40%-145%)
13C-28-TrCB			0.148	0.200	ug/Kg	73.9 (15%-145%)
13C-111-PeCB			0.155	0.200	ug/Kg	77.6 (40%-145%)
13C-178-HpCB			0.163	0.200	ug/Kg	81.7 (40%-145%)

Comments:
C Congener has coeluters. When Cxxx, refer to congener number xxx for data

**PCB Congeners
Certificate of Analysis
Sample Summary**

SDG Number: 1907164	Client: TORR001	Project: TORR00119
Lab Sample ID: 12024443		Matrix: SOIL
Client Sample: QC for batch 41369		
Client ID: LCSD for batch 41369		Prep Basis: As Received
Batch ID: 41373	Method: EPA Method 1668C	
Run Date: 08/07/2019 19:30	Analyst: CLP	Instrument: HRP875
Data File: d07aug19a-4		Dilution: 1
Prep Batch: 41369	Prep Method: SW846 3540C	Prep SOP Ref: CF-OA-E-001
Prep Date: 05-AUG-19	Prep Aliquot: 10 g	

CAS No.	Parmname	Qual	Result	Units	PQL
38444-73-4	PCB-019		0.0574	ug/Kg	0.010
38444-90-5	PCB-037		0.0566	ug/Kg	0.010
15968-05-5	PCB-054		0.106	ug/Kg	0.010
32598-13-3	PCB-077		0.112	ug/Kg	0.010
70362-50-4	PCB-081		0.107	ug/Kg	0.010
56558-16-8	PCB-104		0.108	ug/Kg	0.020
32598-14-4	PCB-105		0.118	ug/Kg	0.010
74472-37-0	PCB-114		0.121	ug/Kg	0.010
31508-00-6	PCB-118		0.117	ug/Kg	0.010
65510-44-3	PCB-123		0.105	ug/Kg	0.010
57465-28-8	PCB-126		0.121	ug/Kg	0.010
33979-03-2	PCB-155		0.118	ug/Kg	0.010
38380-08-4	PCB-156/157	C	0.236	ug/Kg	0.020
52663-72-6	PCB-167		0.120	ug/Kg	0.010
32774-16-6	PCB-169		0.117	ug/Kg	0.010
74487-85-7	PCB-188		0.108	ug/Kg	0.010
39635-31-9	PCB-189		0.113	ug/Kg	0.010
2136-99-4	PCB-202		0.163	ug/Kg	0.010
74472-53-0	PCB-205		0.151	ug/Kg	0.010
40186-72-9	PCB-206		0.149	ug/Kg	0.010
52663-77-1	PCB-208		0.172	ug/Kg	0.010

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-19-TrCB		0.117	0.200	ug/Kg	58.7	(15%-145%)
13C-37-TrCB		0.180	0.200	ug/Kg	89.8	(15%-145%)
13C-54-TeCB		0.145	0.200	ug/Kg	72.4	(15%-145%)
13C-77-TeCB		0.160	0.200	ug/Kg	80.1	(40%-145%)
13C-81-TeCB		0.165	0.200	ug/Kg	82.5	(40%-145%)
13C-104-PeCB		0.178	0.200	ug/Kg	88.9	(40%-145%)
13C-105-PeCB		0.173	0.200	ug/Kg	86.5	(40%-145%)
13C-114-PeCB		0.175	0.200	ug/Kg	87.3	(40%-145%)
13C-118-PeCB		0.172	0.200	ug/Kg	86.2	(40%-145%)
13C-123-PeCB		0.182	0.200	ug/Kg	91.2	(40%-145%)
13C-126-PeCB		0.161	0.200	ug/Kg	80.4	(40%-145%)
13C-155-HxCB		0.164	0.200	ug/Kg	82.2	(40%-145%)
13C-156-HxCB	C	0.341	0.400	ug/Kg	85.3	(40%-145%)
13C-167-HxCB		0.175	0.200	ug/Kg	87.4	(40%-145%)
13C-169-HxCB		0.172	0.200	ug/Kg	86.0	(40%-145%)
13C-188-HpCB		0.169	0.200	ug/Kg	84.5	(40%-145%)
13C-189-HpCB		0.187	0.200	ug/Kg	93.6	(40%-145%)
13C-202-OcCB		0.148	0.200	ug/Kg	74.0	(40%-145%)
13C-205-OcCB		0.196	0.200	ug/Kg	98.1	(40%-145%)

**PCB Congeners
Certificate of Analysis
Sample Summary**

SDG Number: 1907164	Client: TORR001	Project: TORR00119
Lab Sample ID: 12024443		Matrix: SOIL
Client Sample: QC for batch 41369		
Client ID: LCSD for batch 41369		Prep Basis: As Received
Batch ID: 41373	Method: EPA Method 1668C	
Run Date: 08/07/2019 19:30	Analyst: CLP	Instrument: HRP875
Data File: d07aug19a-4		Dilution: 1
Prep Batch: 41369	Prep Method: SW846 3540C	Prep SOP Ref: CF-OA-E-001
Prep Date: 05-AUG-19	Prep Aliquot: 10 g	

CAS No.	Parmname	Qual	Result	Units	Recovery%	PQL
Surrogate/Tracer recovery						
13C-206-NoCB		Qual	Result	Nominal	Units	Acceptable Limits
			0.178	0.200	ug/Kg	89.2 (40%-145%)
13C-208-NoCB			0.162	0.200	ug/Kg	81.1 (40%-145%)
13C-28-TrCB			0.178	0.200	ug/Kg	88.8 (15%-145%)
13C-111-PeCB			0.164	0.200	ug/Kg	81.8 (40%-145%)
13C-178-HpCB			0.168	0.200	ug/Kg	83.9 (40%-145%)

Comments:
C Congener has coeluters. When Cxxx, refer to congener number xxx for data

Appendix B: Beach Facilities Maps

Maps illustrating the boundary and amenities at the 18 County-maintained beaches are included in the pages that follow. The maps were prepared by Los Angeles County in 2016 and are reproduced as-is.

Nicholas Canyon County Beach

Map 1 of 1



<p>Beach Summary 34000 Pacific Coast Highway Malibu, CA 90265</p> <p>Total Beach Area = 44 Acres Total Beach Length = 0.7 Mile</p>	<p>Structures</p> <p>A, Restroom B, Portable Toilets C, Portable Toilets</p> <p>*Hatched area is maintained by private lessee</p>	<p>Parking Lots</p> <p>Nicholas Canyon Lot</p>	<p> Beach Maintenance Areas Parcels Owned by LA Co. Parcels Owned by Other Agencies Other Parcels </p> <p> Feet 0 200 400 800 </p> <p style="text-align: right;"> N </p>
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Source: 2014 County Aerial Imagery

Map updated June 2016 by Department of Beaches and Harbors, Planning Division

Zuma Beach (North Section)

Map 1 of 2



<p>Beach Summary 30050 Pacific Coast Highway Malibu, CA 90265</p> <p>Total Beach Area = 95 Acres Total Beach Length = 1.7 Miles</p>	<p>Structures</p> <p>A, Restroom 9 B, Restroom 8 C, Restroom 7</p>	<p>Parking Lots</p> <p>Lots 7, 8, 9, 10, 11, 12</p>	<p> Beach Maintenance Areas Parcels Owned by LA Co. Other Parcels </p> <p> 0 250 500 1,000 Feet </p> <p style="text-align: right;"> </p>
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Zuma Beach (South Section)

Map 2 of 2



<p>Beach Summary 30050 Pacific Coast Highway Malibu, CA 90265</p> <p>Total Beach Area = 95 Acres Total Beach Length = 1.7 Miles</p>	<p>Structures</p> <p>A, Maintenance Yard B, Restroom 6 C, Concession D, Restroom 5</p>	<p>E, Lifeguard HQ F, Lifeguard HQ G, Restroom 4 H, Restroom 3</p>	<p>I, Concession J, Restroom 2 K, Parking Entry Office L, Restroom 1</p>	<p>Parking Lots Lots 1, 2, 3, 4, 5, 6</p> <p> Beach Maintenance Areas Parcels Owned by LA Co. Other Parcels</p> <p>0 250 500 1,000 Feet</p>
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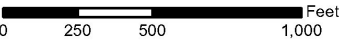

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Point Dume Beach

Map 1 of 1



<p>Beach Summary 7103 Westward Beach Rd. Malibu, CA 90265</p> <p>Total Beach Area = 29 Acres Total Beach Length = 1 Mile</p>	<p>Structures</p> <p>A, Entrance Booth, B, Restroom 1 C, Restroom 2/Lifeguard D, Restroom 3</p>	<p>Parking Lots</p> <p>Point Dume Lot</p>	<p>  Beach Maintenance Areas  Parcels Owned by LA Co.  Other Parcels </p> <p>  Feet  </p>
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Latigo Shores Beach

Map 1 of 1



Beach Summary
 26700 Latigo Shore Dr.
 Malibu, CA 90265

 Total Beach Area = 1.9 Acres
 Total Beach Length = 0.1 Mile

Structures
 None

Parking Lots
 None

Beach Maintenance Areas
 Parcels Owned by LA Co.
 Parcels Owned by Other Agencies
 Other Parcels

Feet
 0 50 100 200

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Dan Blocker Beach

Map 1 of 1



<p>Beach Summary 26200 Pacific Coast Highway Malibu, CA 90265</p> <p>Total Beach Area = 15 Acres Total Beach Length = 1.1 Miles</p>	<p>Structures</p> <p>A, Restroom (built after 2014 Aerial was taken) B, Portable Toilets C, Portable Toilets</p>	<p>Parking Lots</p> <p>Dan Blocker lot was built after 2014 aerial was taken.</p>	<p> Beach Maintenance Areas Parcels Owned by LA Co. Parcels Owned by Other Agencies Other Parcels </p> <p> 0 250 500 1,000 Feet N </p>
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Source: 2014 County Aerial Imagery

Map Created March 2016, by Department of Beaches and Harbors, Planning Division

Malibu (Surfrider) Beach

Map 1 of 1



Beach Summary

23200 Pacific Coast Highway
Malibu, CA 90265

Total Beach Area = 8.3 Acres
Total Beach Length = 0.4 Mile

Structures

- A, Entrance Booth
- B, Restroom
- C, Lifeguard Storage Shed
- D, Portable Toilets

Parking Lots

Malibu Lagoon Lot

- Beach Maintenance Areas
- Parcels Owned by LA Co.
- Parcels Owned by Other Agencies
- Other Parcels



Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Las Tunas Beach

Map 1 of 1



<p>Beach Summary 19444 Pacific Coast Highway Malibu, CA 90265</p> <p>Total Beach Area = 1.9 Acres Total Beach Length = 0.3 Mile</p>	<p>Structures A, Portable Toilets B, Portable Toilets</p>	<p>Parking Lots None</p>	<p> Beach Maintenance Areas Parcels Owned by LA Co. Parcels Owned by Other Agencies Other Parcels </p> <p> 0 100 200 400 Feet N </p>
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Topanga County Beach

Map 1 of 1



Beach Summary
 18600 Pacific Coast Highway
 Malibu, CA 90265

 Total Beach Area = 20 Acres
 Total Beach Length = 1 Miles

Structures
 A, Restroom/Lifeguard
 B, Portable Toilets

Parking Lots
 Lot West, Unpaved
 Lot East, Paved

Beach Maintenance Areas
 Parcels Owned by LA Co.
 Other Parcels

Feet
 0 250 500 1,000

N

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Will Rogers State Beach

Map 1 of 5



Beach Summary
 15100 Pacific Coast Highway
 Pacific Palisades, CA 90272

 Total Beach Area = 103 Acres
 Total Beach Length = 2.9 Miles

Structures
 A, Restroom (Castle Rock)
 B, Lifeguard Tower (Castle Rock)

Parking Lots
 Coastline Parking Lot,
 (built after this 2014 aerial)
 Parking Lot 5

Beach Maintenance Areas
 Parcels Owned by LA Co.
 Parcels Owned by Other Agencies
 Other Parcels

0 200 400 800 Feet





Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Will Rogers State Beach

Map 2 of 5



<p>Beach Summary 15100 Pacific Coast Highway Pacific Palisades, CA 90272</p> <p>Total Beach Area = 103 Acres Total Beach Length = 2.9 Miles</p>	<p>Structures A, Portable Toilets</p>	<p>Parking Lots Parking Lot 4 (Gladstones) Maintained by Lessee</p>	<p> Beach Maintenance Areas</p> <p> Parcels Owned by Other Agencies</p> <p> Other Parcels</p> <p>0 200 400 800 Feet </p>
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Will Rogers State Beach

Map 3 of 5



<p>Beach Summary 15100 Pacific Coast Highway Pacific Palisades, CA 90272</p> <p>Total Beach Area = 103 Acres Total Beach Length = 2.9 Miles</p>	<p>Structures A, Entrance Booth B, Concession #2 (Temescal) C, Restroom (Temescal) D, Restroom (Bel Air) E, DBH Maintenance Yard</p>	<p>Parking Lots Parking Lot 2, 3</p>	<p>Legend</p> <ul style="list-style-type: none"> Beach Maintenance Areas Parcels Owned by Other Agencies Other Parcels <p>0 200 400 800 Feet </p>
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Will Rogers State Beach

Map 4 of 5



<p>Beach Summary 15100 Pacific Coast Highway Pacific Palisades, CA 90272</p> <p>Total Beach Area = 103 Acres Total Beach Length = 2.9 Miles</p>	<p>Structures A, WR Lifeguard HQ B, Restroom (Lifeguard)</p>	<p>Parking Lots Parking Lot 2</p>	<p>Legend</p> <ul style="list-style-type: none"> Beach Maintenance Areas Parcels Owned by Other Agencies Other Parcels <p>0 200 400 800 Feet </p>
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Will Rogers State Beach

Map 5 of 5



Beach Summary
 15100 Pacific Coast Highway
 Pacific Palisades, CA 90272

 Total Beach Area = 103 Acres
 Total Beach Length = 2.9 Miles

Structures
 A, Concession #1 / Restroom (Chautauqua)

Parking Lots
 Parking Lot 1

Beach Maintenance Areas
 Parcels Owned by Other Agencies
 Other Parcels

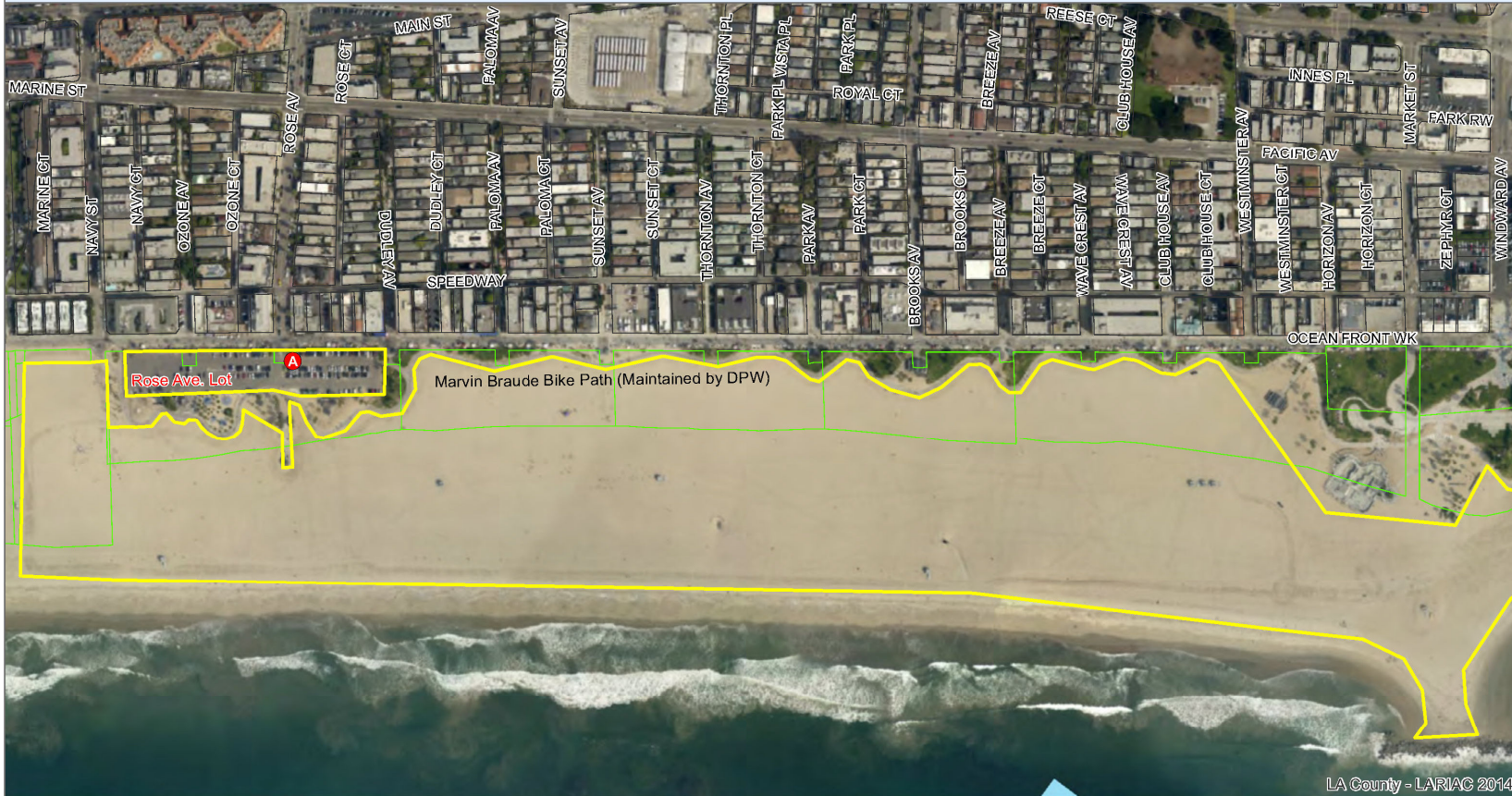
Feet
 0 200 400 800

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Venice Beach

Map 1 of 3



LA County - LARIAC 2014

Beach Summary
 1800 Ocean Front Walk
 Venice, CA 90291

 Total Beach Area = 129 Acres
 Total Beach Length = 2.4 Miles

Structures
 A, Parking Booth

Parking Lots
 Rose Ave. Lot

Beach Maintenance Areas
 Parcels Owned by Other Jurisdictions
 Other Parcels

Feet
 0 200 400 800

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Venice Beach

Map 2 of 3



Beach Summary
 1800 Ocean Front Walk
 Venice, CA 90291

 Total Beach Area = 129 Acres
 Total Beach Length = 2.4 Miles

Structures
 A, Parking Booth
 B, Restroom
 C, DBH Maint / Lifeguard HQ
 D, Parking Booth

Parking Lots
 Venice Blvd. Lot
 Washington Blvd. Lot

Beach Maintenance Areas
 Parcels Owned by Other Agencies
 Other Parcels

Feet
 0 200 400 800

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Venice Beach

Map 3 of 3



Beach Summary
 1800 Ocean Front Walk
 Venice, CA 90291

 Total Beach Area = 129 Acres
 Total Beach Length = 2.4 Miles

Structures
 No Structures

Parking Lots
 Washington Blvd. Lot

Beach Maintenance Areas
 Parcels Owned by Other Agencies
 Other Parcels

Feet
 0 200 400 800

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division



Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Dockweiler State Beach

Map 1 of 4



Beach Summary
 8255 Vista Del Mar
 Playa del Rey, CA 90293
 Total Beach Area = 254 Acres
 Total Beach Length = 3.8 Miles

Structures
 A, Restroom (Yawl St)
 B, Restroom (Culver)
 C, Lifeguard (Culver)

Parking Lots
 62nd Avenue Lot

Beach Maintenance Areas
 Parcels Owned by Other Agencies
 Other Parcels

Feet
 0 250 500 1,000

N
↑

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Dockweiler State Beach

Map 2 of 4



Beach Summary
 8255 Vista del Mar
 Playa del Rey, CA 90293

 Total Beach Area = 254 Acres
 Total Beach Length = 3.8 Miles

Structures
 A, Gillis Septic Pumphouse
 B, Restroom (Gillis)
 C, DBH Maintenance Yard
 D, Lifeguard Headquarters

Parking Lots
 Not shown on this page.

- Beach Maintenance Areas
- Parcels Owned by Other Agencies
- Other Parcels



Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Dockweiler State Beach

Map 3 of 4



<p>Beach Summary 8255 Vista del Mar Playa del Rey, CA 90293</p> <p>Total Beach Area = 254 Acres Total Beach Length = 3.8 Miles</p>	<p>Structures</p> <p>A, Restroom (Deauville) B, Kilgore Septic Pumphouse C, Restroom (Kilgore)</p>	<p>D, Concession E, Parking Entry Office F, Lifeguard Tower 56</p>	<p>Parking Lots Lots 1, 2, 3</p>	<p>  Beach Maintenance Areas  Parcels Owned by Other Agencies  Other Parcels </p> <p>  Feet  </p>
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Dockweiler State Beach

Map 4 of 4



Beach Summary
 8255 Vista del Mar
 Playa del Rey, CA 90293
 Total Beach Area = 254 Acres
 Total Beach Length = 3.8 Miles

Structures
 A, Restroom
 B, Restroom
 C, RV Lot Electrical Room
 D, Restroom

E, Concession / Restroom
 F, Dockweiler Youth Center
 G, Parking Entry Office
 H, Hang-Gliding Concession/Office

Parking Lots
 R.V. Lot
 Bluff Lot
 Grand Ave. Lot

Beach Maintenance Areas
 Parcels Owned by Other Agencies
 Other Parcels

0 200 400 800 Feet

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Manhattan Beach (North Section)

Map 1 of 2



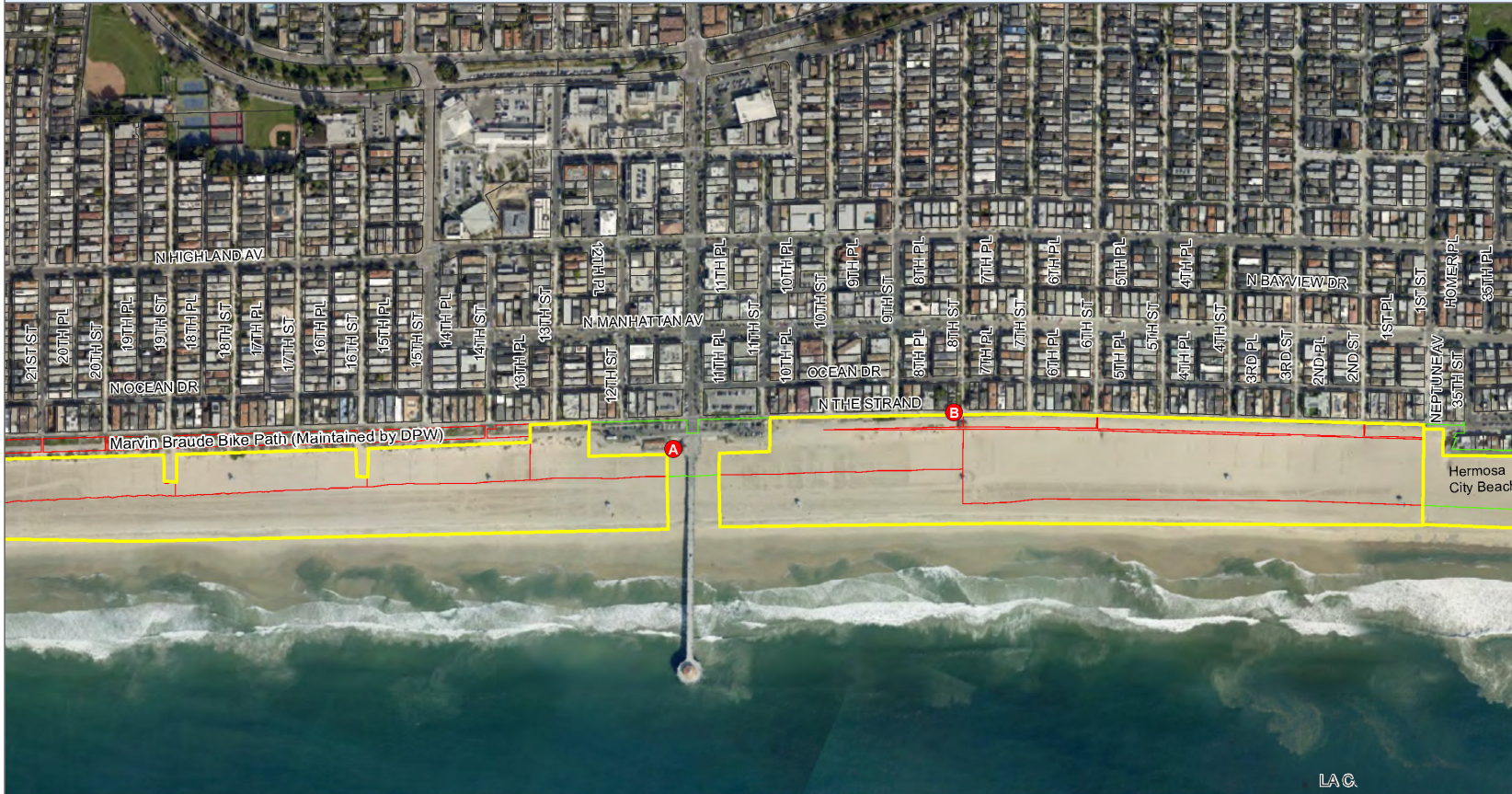
<p>Beach Summary 4217 The Strand Manhattan Beach, CA 90266</p> <p>Total Beach Area = 77 Acres Total Beach Length = 2 Miles</p>	<p>Structures</p> <ul style="list-style-type: none"> A, Restroom (El Porto) B, Concession C, Restroom / Lifeguard / Maint (Rosecrans) D, Lifeguard Training Center / Restroom E, Restroom / Lifeguard (Marine) 	<p>Parking Lots</p> <p>None</p>	<ul style="list-style-type: none"> Beach Maintenance Areas Parcels Owned by LA Co. Other Parcels <p>0 250 500 1,000 Feet</p> <p>North arrow</p>
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Manhattan Beach (South Section)

Map 2 of 2



Beach Summary
 4217 The Strand
 Manhattan Beach, CA 90266
 Total Beach Area = 77 Acres
 Total Beach Length = 2 Miles

Structures
 A, Lifeguard
 B, Restroom (8th St)

Parking Lots
 None

Beach Maintenance Areas
 Parcels Owned by LA Co.
 Parcels Owned by Other Agencies
 Other Parcels

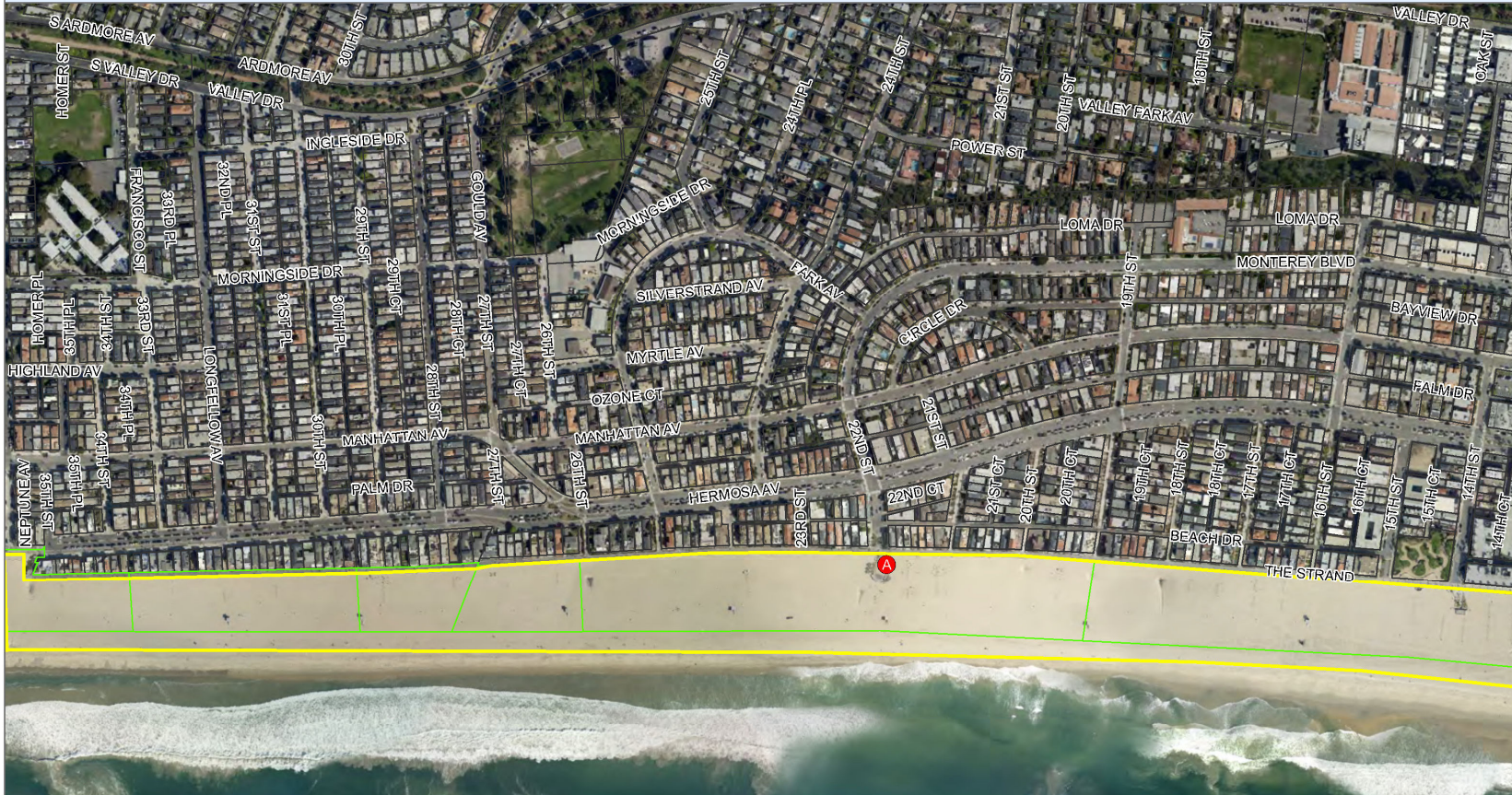
0 250 500 1,000 Feet N

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Hermosa City Beach (North Section)

Map 1 of 2



Beach Summary
 1300 The Strand
 Hermosa Beach, CA 90254

 Total Beach Area = 78 Acres
 Total Beach Length = 1.8 Miles

Structures
 A, Restroom (22nd St)

Parking Lots
 None

Beach Maintenance Areas
 Parcels Owned by Other Agencies
 Other Parcels

Feet
 0 250 500 1,000

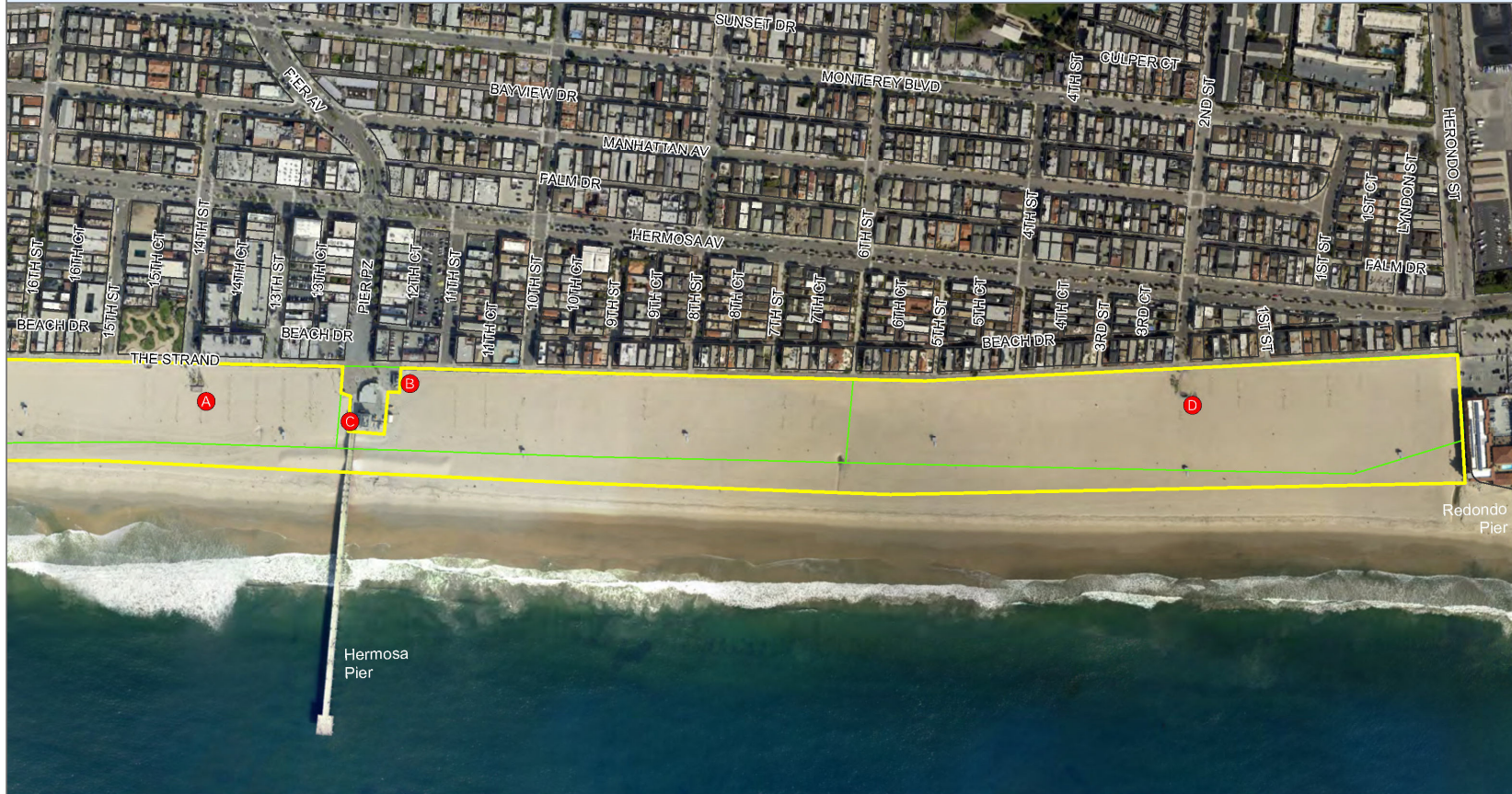
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Hermosa City Beach (South Section)

Map 2 of 2



Beach Summary
 1300 The Strand
 Hermosa Beach, CA 90254
 Total Beach Area = 78 Acres
 Total Beach Length = 1.8 Miles

Structures
 A, Restroom (14th St)
 B, Restroom
 C, Southern Lifeguard HQ
 D, Restroom (2nd St)

Parking Lots
 None

- Beach Maintenance Areas
- Parcels Owned by Other Agencies
- Other Parcels

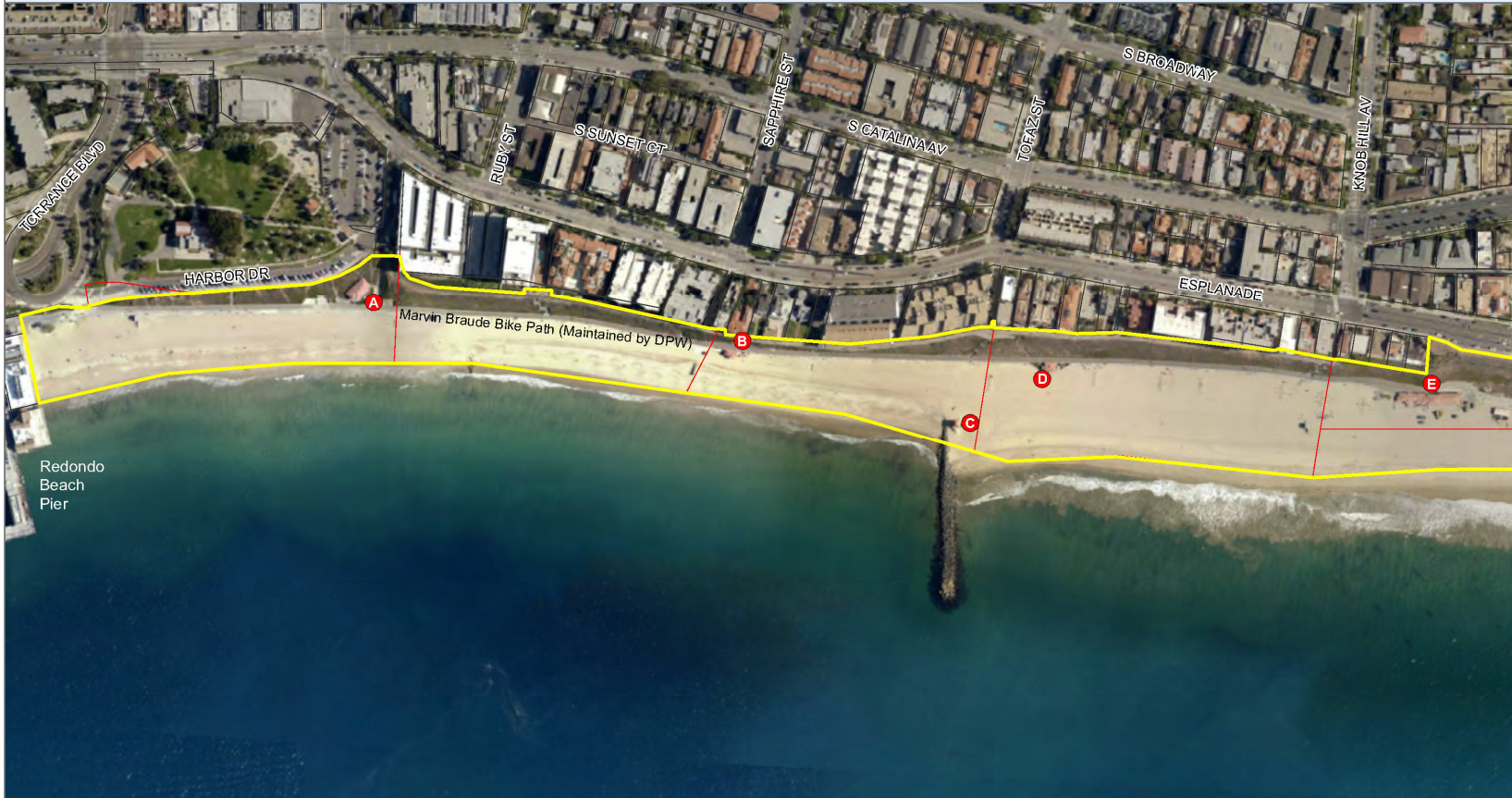


Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Redondo Beach (North Section)

Map 1 of 2



<p>Beach Summary 743 S. Esplanade Redondo Beach, CA 90277</p> <p>Total Beach Area = 51 Acres Total Beach Length = 1.6 Miles</p>	<p>Structures</p> <p>A, Restroom (Ainsworth) B, Restroom/Lifeguard (Sapphire) C, Permanent Lifeguard Tower (Topaz/RCO) D, Restroom (Topaz) E, Restroom/Maintenance Yard (Knob Hill)</p>	<p>Parking Lots None</p>	<p> Beach Maintenance Areas  Parcels Owned by LA Co.  Other Parcels</p> <p></p>
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Redondo Beach (South Section)

Map 2 of 2



<p>Beach Summary 743 S. Esplanade Redondo Beach, CA 90277</p> <p>Total Beach Area = 51 Acres Total Beach Length = 1.6 Miles</p>	<p>Structures</p> <p>A, Restroom/Lifeguard HQ (Ave C) B, Restroom (Ave G) C, Restroom (Ave I)</p>	<p>Parking Lots</p> <p>None</p>	<p> Beach Maintenance Areas Parcels Owned by LA Co. Other Parcels </p> <p> 0 200 400 800 Feet z </p>
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Torrance Beach

Map 1 of 1



<p>Beach Summary 389 Paseo De La Playa Redondo Beach, CA 90277</p> <p>Total Beach Area = 18 Acres Total Beach Length = 0.3 Mile</p>	<p>Structures</p> <p>A, Restroom B, Parking Booth C, Restroom / Lifeguard D, Concession</p>	<p>Parking Lots Torrance Lot</p>	<p> Beach Maintenance Areas Parcels Owned by LA Co. Parcels Owned by Other Agencies Other Parcels </p> <p> 0 100 200 400 Feet </p>
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Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Royal Palms County Beach

Map 1 of 1



Beach Summary
 1799 S. Paseo del Mar
 San Pedro, CA 90732

 Total Beach Area = 21 Acres
 Total Beach Length = 0.7 Mile

Structures
 A, Restroom

Parking Lots
 Royal Palms Lot

Beach Maintenance Areas
 Parcels Owned by LA Co.
 Parcels Owned by Other Agencies
 Other Parcels

0 200 400 800 Feet

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

White Point County Beach

Map 1 of 1



Beach Summary
 1900 S. Paseo del Mar
 San Pedro, CA 90732

 Total Beach Area = 28 Acres
 Total Beach Length = 0.8 Mile

Structures
 A, Parking Booth
 B, Restroom
 C, Mary Star Baseball Field
 D, Portable Toilets

Parking Lots
 Upper Lot
 Lower Lot

Beach Maintenance Areas
 Parcels Owned by the County
 Parcels Owned by Other Agencies
 Other Parcels

0 200 400 800 Feet

Source: 2014 County Aerial Imagery

Map Created March 2016 by Department of Beaches and Harbors, Planning Division

Appendix C: November Board Motion

Revised Motion by Supervisors Lindsey P. Horvath and Holly J. Mitchell for the Regular Meeting of the Board of Supervisors of the County of Los Angeles on Tuesday, November 7, 2023.

Accessed on December 26, 2023 at: <https://file.lacounty.gov/SDSInter/bos/supdocs/185727.pdf>

AGN. NO.

REVISED MOTION BY SUPERVISORS LINDSEY P. HORVATH November 7, 2023
AND HOLLY J. MITCHELL

Protecting LA County’s beaches from coastal erosion through the beneficial reuse of sediment and by deploying living shorelines

The Los Angeles County (LAC) shoreline is world-renowned. Home to iconic sites like the Malibu Pier and Venice’s Muscle Beach, the 75-mile-long mainland coastline has been immortalized in film and media and attracts some 70-million day visits annually. The County’s ocean-related tourism and recreation industries contribute tens of thousands of jobs to the local economy and produced over \$2.2 billion in GDP in 2020.

LAC operates 18 beaches, each located in a densely urbanized environment and each provide a critical public resource to inland residents, many of whom live in historically disadvantaged and pollution-burdened communities. For example, on a hot day, Third District residents from the San Fernando Valley flock to Malibu’s world-class Zuma Beach due to its ocean breeze, relative proximity, and accessibility. According to the County’s Climate Vulnerability Assessment, by mid-century, most of LAC will have high exposure to extreme heat, with over 2 million people considered highly vulnerable based on temperatures and adaptation capacity. The County’s beaches are more than just cultural

MOTION

SOLIS _____

MITCHELL _____

HORVATH _____

BARGER _____

HAHN _____

touchstones: they provide a critical public resource to residents seeking respite from extreme heat, access to the water and nature, and recreational opportunities.

The wide beaches in Southern California have been maintained by various agencies through beach nourishment projects and the construction of protective coastal structures since the 1930s. However, since the 1960s, rates of beach replenishment have significantly decreased. In addition, a legacy of sprawling development throughout the region, and channelized flood control infrastructure that has deprived local beaches of natural sources of sedimentary nourishment from mountain streams, creeks, and other waterways have contributed to a gradual erosion of our LAC coastline. Long practiced beach maintenance activities such as grooming (the raking of the beach with heavy equipment), armoring, and the creation of tractor-built seasonal sand berms create short term protection from trash and storm surge but may undermine the formation of sustainable natural features that reduce erosion and coastal flooding. Combined with increasingly dynamic weather patterns including more frequent, intense storms and surf, and LAC projected sea level rise of between 0.6 and 1.1 feet by 2050, many of the County's beaches are narrowing, with some ebbing close to elimination.

The Department of Beaches and Harbors will soon release a Coastal Resiliency Strategy that will provide a detailed risk assessment of all 18 County-operated beaches and an adaptation plan that identifies strategies to reduce risks of beach loss, with ranked priority based on physical vulnerability and accessibility of each beach. Adaptation strategies, which are currently in the conceptual review stage, will prioritize nature-based living

shoreline adaptations, such as dune habitat enhancement, in conjunction with beach widening and hybrid hard structures where necessary and appropriate, to build lasting resilience along our coastline. A pilot project in Santa Monica led by the Bay Foundation and with support from the Santa Monica Bay Restoration Commission shows the benefits of this approach. In addition to protecting the shorelines, these interventions would create habitat for wildlife on the beach and in the adjacent inter-tidal and underwater habitats. To accomplish beach widening that will provide the necessary land for dune habitat enhancement, and sufficient space for recreational activities, sand nourishment is critical.

Climate change is not only threatening our coastline, but also our County's immense flood control infrastructure, due to higher intensity and frequency of wildfires and storms. These both have led to a significant increase in the amounts of sediment and debris deposited in the Flood Control District's (District) debris basins and reservoirs. In 2022, the District developed a Sediment Management Strategic Plan (SMSP), which estimates that over the next 10 years, the District will need to remove approximately 15 million cubic yards of sediment from its various facilities at a cost of \$570 million. Currently, dredged sediment is sent to Sediment Placement Sites in the Angeles National Forest (which are expected to reach capacity within 20 years) or sent to regional landfills (of which we have just 11 still in operation in LAC).

An updated SMSP is being developed and it should include the potential beneficial use of sediment removed from District facilities for beach replenishment and include updated cost estimates, environmental impacts, sediment testing protocols, community outreach,

logistics, transportation, and permitting requirements. The District should also consider other alternatives for sediment that may not be suitable for beaches, such as use for sand bags to assist during storms and floods. This work should have implications for other major public works projects that may generate large amounts of sediment, such as Metro, the California High Speed Rail, and the proposed decommissioning of the Rindge Dam.

The District is undertaking a herculean effort of sediment removal to protect the long-term viability, safety, flood-control, and water conservation capacity of our flood infrastructure, much of which was built nearly a century ago. Los Angeles' iconic beaches are a product of major investments which took place at nearly the same time and require significant planning and investment to survive into the next century. These mutually beneficial efforts will require a coalition of government, non-profit, academic, and community partners to guarantee these essential County resources can adapt to a changing climate. It will also require an ambitious fundraising strategy involving Federal (e.g. National Oceanic and Atmospheric Administration, Federal Emergency Management Agency), State (e.g. Coastal Conservancy, Wildlife Conservation Board), and philanthropic sources. The potential beneficial reuse of sediment from the District can nourish our beaches with sand, maintain and restore our coastlines, and provide the expanded area necessary to implement the hybrid living shoreline strategies that will enhance coastal resilience, native habitat, and biodiversity.

We owe it to Angelenos to ensure that our beaches remain resilient and accessible for generations to come.

WE, THEREFORE, MOVE that the Board of Supervisors:

1. Direct the Director of Beaches and Harbors, with the assistance of the Chief Sustainability Officer and the Director of Public Works, to report back in writing within 90 days with an outreach and fundraising strategy for the implementation of the Coastal Resiliency Strategy based on deploying living shorelines at Los Angeles County beaches. The funding strategy should identify federal, state, and foundation funding targets, and a proposed coalition of partners including coastal cities, tribes, non-profits, academic institutions, and potential technical and regulatory experts that can participate in regular convenings; and
2. Direct the Director of Public Works, acting as the Chief Engineer of the Los Angeles County Flood Control District, with the assistance of the Chief Sustainability Officer, to report back in writing in 120 days with a strategy for the beneficial reuse of sediment, including environmental and transportation considerations (including consideration of natural sediment transport), and including fiscal impacts and funding opportunities, that could be used to address coastal erosion and other potential uses of sediment; and
3. Direct the Director of Beaches and Harbors, with the assistance of the Chief Sustainability Officer, to report back in writing in 120 days with a strategy for beneficial reuse of dredged marina and ocean sediment and of the feasibility, permitting requirements, and other considerations for reusing sediment – regardless of source – on beaches and for departmental uses; and
4. Direct the Director of Beaches and Harbors and the Director of Public Works, acting as the Chief Engineer of the Los Angeles County Flood Control District

to separately report back within 120 days on any staffing or other resources needed to implement these strategies.

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