Remedial Investigation Report
Tru-Grit Abrasives, Inc.

1110 E. Alexander Avenue
Tacoma, Washington
Cleanup Site ID: 1294

December 17, 2021

Prepared for

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Tacoma, Washington

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LIST OF ABBREVIATIONS AND ACRONYMS

AO	Agreed Order
AST	aboveground storage tank
CanAm	CanAm Minerals, Inc.
CBNT	Commencement Bay Near-shore/Tideflats
cm	centimeters
cm/yr	centimeters per year
COC	chain of custody
COPCs	contaminants of potential concern
CSL	cleanup screening levels
CSM	conceptual site model
CUL	cleanup level
°C	degrees Celsius
DGPS	differential global positioning system
Ecology	Washington State Department of Ecology
EIM	Environmental Information Management (Ecology)
EPA	US Environmental Protection Agency
FS	feasibility study
ft	feet/foot
HPAH	high molecular weight polycyclic aromatic hydrocarbon
LAI	Landau Associates, Inc.
LPAH	low molecular weight polycyclic aromatic hydrocarbon
m	meter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
µS/cm	microsiemens per centimeter
MLLW	mean lower low water
MTCA	Model Toxics Control Act
NGVD29	National Geodetic Vertical Datum of 1929
Orion Marine	Orion Marine Group, Inc.
PCBs	polychlorinated biphenyls
PLP	potentially liable party
PMI	Port Maritime and Industrial
Port	Port of Tacoma
PSEP	Puget Sound Estuary Program
PSL	primary screening level
QC	quality control
RI	remedial investigation
RL	reporting limits
RSS	Research Support Services, Inc.
SAP	sampling and analysis plan

SCO	sediment cleanup objective
sf	square foot
SMS	Sediment Management Standards
SPLP	synthetic precipitation leaching procedure
SVOC	semi-volatile organic compound
TCLP	toxicity characteristic leaching procedure
TestAmerica	TestAmerica Laboratories, Inc.
TOTE	Totem Ocean Trailer Express
Tru-Grit	Tru-Grit Abrasives, Inc.
USCS	Unified Soil Classification System
WAC	Washington Administrative Code
WQEO	Water Quality Enforcement Order

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1.0 INTRODUCTION

Under the terms of Agreed Order (AO; No. DE-8978), this remedial investigation (RI) report has been prepared for application to the Tru-Grit Abrasives, Inc. site (Tru-Grit; Site), located in Tacoma, Washington. The Washington State Department of Ecology (Ecology) identified CanAm Minerals, Inc. (CanAm; parent company of Tru-Grit) as a potentially liable party (PLP) under the Washington State Model Toxics Control Act and its implementing regulations (MTCA; Chapter 173-340 of the Washington Administrative Code [WAC]).

This report was prepared for submittal to Ecology in accordance with the provisions of the AO and developed to meet the general requirements of an RI as defined by the MTCA Cleanup Regulation (WAC 173-340-350). This RI report summarizes the project background, describes the field activities and the environmental setting of the Site, explains the development of the Site preliminary screening levels (PSLs), presents the results of investigation activities, develops a conceptual site model (CSM) for the Site, and presents conclusions and recommendations based on the data collected.

1.1 SITE DESCRIPTION

The Site, as described in AO No. DE-8978, is defined by the potential extent of contamination caused by the release of hazardous substances. The Site is not limited to lease area or property area boundaries and includes areas where hazardous substances have been deposited, stored, disposed of, placed, or otherwise have come to be located. The Site is located adjacent to the Blair Waterway in the Port of Tacoma (Port) and includes both upland and in-water areas. The upland portion of the Site includes the Tru-Grit facility[1] and portions of the adjacent facility leased by Orion Marine Group, Inc. (Orion Marine) in Tacoma, Washington, which Tru-Grit briefly used for material storage historically.

The Tru-Grit facility occupies a portion of a tax parcel number 2275200292, located at 1110 East Alexander Avenue (Figure 1). Tru-Grit leases a portion of the property from the Port. The parcel is rectangular with the long axis oriented northwest to southeast, parallel to the Blair Waterway (the southwest side of the parcel extends approximately 130 feet [ft] into the waterway). The Tru-Grit facility occupies the northwestern one-third of the parcel; Orion Marine, a civil marine contractor, occupies the remaining two-thirds of the parcel (Figure 2). The parcel is zoned Port Maritime and Industrial (PMI) and Shoreline Port Industrial. For the purposes of this document, **Property** refers to the tax parcel occupied by both the Tru-Grit and the Orion Marine operational areas, **Facility** refers solely to the Tru-Grit operational area, and **Site** refers to the entire cleanup site that encompasses areas outside the Facility.

[1] Note that MTCA defines the term "Facility" to mean the same as "Site"; however, in this document the term "Site" is used in accordance with the definition under MTCA and the term "Facility" is used to mean the Tru-Grit operational area.

1.2 OBJECTIVES OF THE REMEDIAL INVESTIGATION

The objective of the RI is to collect and evaluate sufficient information regarding potential contamination at the Site resulting from activities at the Facility to determine if the Site requires remedial action and, if so, enable the selection of a cleanup action (WAC 173-340-350). If required, selection of the proposed Site cleanup levels (CULs) and the evaluation and recommendation of a cleanup action will be completed during the feasibility study (FS), which will be provided under separate cover following approval of this RI.

1.3 REPORT ORGANIZATION

This report is organized as follows:

- Section 2.0 (Background) presents project background, including a summary of current and historical operations at the Site, and a description of previous environmental investigations.
- Section 3.0 (Remedial Investigation Activities) describes the RI activities, including soil, groundwater, and marine sediment investigations.
- Section 4.0 (Environmental Setting) describes the environmental setting of the Site, including its physical features, geology, hydrogeology, natural resources, and land use.
- Section 5.0 (Preliminary Site Screening Levels) explains the development of Site PSLs for affected media. The PSLs are used in Section 6.0 to evaluate the nature and extent of contamination at the Site.
- Section 6.0 (Nature and Extent of Contamination) presents the results of the investigation activities, which delineate the nature and extent of contamination at the Site.
- Section 7.0 (Conceptual Site Model) develops the CSM, including the current and future land use, affected media, and the potential receptors and exposure pathways evaluated during the investigation process.
- Section 8.0 (Conclusions and Recommendations) presents the conclusions of the RI, identifies the remaining data gaps, and recommends further proposed actions to address these gaps prior to preparation of the FS.

2.0 BACKGROUND

As noted in Section 1.1, the Site is located along the Blair Waterway at the Port and includes both upland and in-water portions. The upland portion includes the Facility, a storage and distribution facility of a granular abrasive material used in composite roofing and sandblast grit. The Facility is operated by CanAm; the property is leased from the Port. The in-water portion of the Site extends outward from the high-water mark to the lateral extent of contamination (presented in Section 6.0). The following sections present current and historical operations and summarize previous investigations completed at the Site.

2.1 TRU-GRIT OPERATIONS

Former operations at the Facility, located within the uplands portion of the Site, included storage and handling of granular slag material sold to roofing manufacturers and sandblasters under the name Tru-Grit Roofing Granules. For the purposes of this document, the Tru-Grit granular slag material is referred to as **grit** or **grit material**. Prior to 2013, handling of the grit material included receipt by barge; offloading via a ship-to-shore conveyance system; and storage, processing, and packaging for resale. Current operations at the Facility include only the processing and packaging of grit for resale; offloading and storage activities are currently being conducted at another Tru-Grit location.

The grit material is derived from vitrified granular slag that was initially produced by a copper smelter near Anyox (Granby Bay), British Columbia, Canada in the early 1900s. Prior to transport from Canada, granular slag is washed and wet-screened to remove the fine components and oversized material. Only slag of a size suitable for roofing granules and sandblasting is sent to Tru-Grit for processing.

A front-end loader and a ship-to-shore conveyance system were used to unload grit from the barges when they arrived at the Facility. The offloading operation was conducted approximately 2–3 times per year, starting in 1990 and continued until offloading at the Facility ceased in 2013. A front-end loader on the barge was used to load grit material onto the ship-to-shore conveyance system. The ship-to-shore conveyance system consisted of a covered unloading conveyor, which transported the grit material from the barge to a hopper with tail-end containment skirting at the southwest corner of the former dock structure. From this hopper, a second 240-ft long conveyor transported material along the western edge of the former dock to an outdoor storage area. The covered conveyor, hopper, and approximately 100 ft of the second conveyor were located over water or over tidelands. The remainder of the second conveyor and the storage areas were located upland. The outdoor storage area was surrounded by a concrete block wall (e.g., ecology blocks) stacked together to an approximate height of 8 ft. For a brief period between 2005 and 2007, grit was temporarily stored in piles on the Orion Marine portion of the Property for 2-week intervals following each barge offloading. This practice ended in 2007 when Tru-Grit purchased a taller stacker that allowed

offloaded grit material to be stored within the ecology block containment area. Offloading of grit material was discontinued at the site in 2013; from 2013 to 2020 grit material was offloaded from barges at Tru-Grit's nearby facility on Taylor Way and trucked from the Taylor Way facility to the upland storage area of the Site for processing. In 2020, Tru-Grit ceased processing operations at the Alexander Avenue property.

For processing activities, which still occur at the Facility, the grit is removed from the containment area by a front-end loader and subsequently placed into a hopper. The grit is then passed through a dryer and a screening device to separate grit for the manufacture of roofing material from grit sold as sandblast grit. Airborne particulates generated from the drying and screening operations are collected with an air pollution control device (i.e., baghouse) and sent to a solid waste landfill for disposal. Grit to be sold as sandblast material is stored in a load-out bin or packaged into bags. From the load-out bin, the grit is loaded into trucks, weighed, and sent to the customer.

In addition to the ship-to-shore conveyance system, the stacking conveyor, and the containment area, the other main feature at the Facility is a maintenance building on the southwest side, adjacent to the waterway. Also, two 275-gallon aboveground storage tanks (ASTs) are present at the Site. One AST contains diesel fuel, and one AST contains annealing oil, which is used during material processing. Both ASTs are equipped with secondary containment, and no apparent releases to the environment have occurred from the tanks or secondary containment systems. The Facility is fully paved except for a vegetated strip of land between the maintenance building and the shoreline. Site features are shown on Figure 3.

2.2 HISTORICAL OPERATIONS AND USES

The Facility began operating in the northwestern portion of the Property in approximately 1990. Orion Marine, a heavy civil marine construction contractor, has occupied the southeastern portion of the Property since about 2009. Prior to 2009, the southeastern portion of the Property was leased by Jesse Engineering (a steel fabrication company), BJ Painting, and Hemco (a plastics company). Little is known about BJ Painting and Hemco's operations; however, BJ Painting may have provided marine-related painting services.

During the mid-1980s, before the arrival of Tru-Grit, the Property appears to have been temporarily unoccupied based on city directory listings. Between the mid-1960s and 1980, the property use appears to have been related to boat storage and maintenance, shipbuilding, and marine construction under various owners including: Sexton Marine, Sea-Tac Alaska Ship Building Corporation, A.H. Powers, and Martinolich. A floating dry dock appears to have been in use by Martinolich at the property in the 1960s through 1970s. The floating dry dock was attached to the Site's former dock structure in approximately the same location where barges were moored for offloading grit material. Martinolich also operated at least

two marine railways for vessel haul-out/launch and an outdoor vessel maintenance yard. Historical photographs of the ship building operation at the site are provided in Appendix F. Although, the specific operations of the shipbuilding and maintenance operations are not known, use of ASARCO slag for abrasive blast grit was common in shipyards before the mid-1980s. Prior to the shipbuilding and maintenance operations, the property was listed in the city directory as Port Waterway Marina (1963) (Brown and Caldwell 2009; Tacoma Public Library 2012a, b).

2.2.1 ADJACENT PROPERTIES

The Property is bordered to the northwest by Totem Ocean Trailer Express (TOTE), a container terminal, and to the east and south by an L-shaped property operated by Graymont Western, a producer of lime and precipitated calcium carbonate products (Figure 2). Historical operations along the waterway also include the Todd Shipyard facility located approximately ½ mile to the northwest, which operated from approximately 1917 to 1940 and reportedly contributed heavy metals contamination in the waterway (Brown and Caldwell 2009).

2.2.1.1 Totem Ocean Trailer Express

The TOTE facility is located at 500 Alexander Avenue, northwest of the Property, and encompasses approximately 43 acres of fully paved asphalt. TOTE has occupied the property since 1984; before then, previous occupants are unknown, though it is possible other shipping-related industries may have occupied the property.

TOTE is a roll-on/roll-off facility, where cargo is transported on and off shipping vessels via trucks or vans, rather than with cranes. Approximately two to three shipping vessels are present at the TOTE facility each week during normal operations (RETEC 2007). Industrial activities at the TOTE facility include maintenance and refueling of refrigerated trailers, maintenance and repair of roll-off boxes, loading and unloading of dry bulk materials and liquids, and outdoor storage of materials and products.

Features of the TOTE facility include cargo loading and layup piers, a dryout shed, a vessel warehouse, and two maintenance shops. Other features include fenced-off vehicle and trailer yards, waste-staging containment, and some lubricant and waste oil tanks.

Since 2011, stormwater from the TOTE facility is directed to a stormwater collection system, where it is treated and infiltrated. Prior to 2011, stormwater was directed to a stormwater collection system (equipped with oil/water separators) that discharged to the Blair Waterway at Outfall 4 (Figure 3). Historically, effluent at this outfall has had elevated copper and zinc concentrations (Landau Associates, Inc. [LAI] 2013).

2.2.1.2 Graymont Western

The Graymont Western facility is located at 1220 Alexander Avenue, east of the Property. Graymont Western is a producer of lime, which is stockpiled on its property. Several structures and facilities for lime production and storage are located on this property, as well as several aboveground storage tanks used for storing petroleum products.

Graymont Western has occupied this location since approximately 2007. Prior to Graymont Western, another lime producer, Continental Lime, Inc. occupied the property from the mid-1980s. Between the mid-1970s and the arrival of Continental Lime, the property was occupied by Domtar Chemicals, Inc. Before that, the property was used for the storage and production of lime since at least 1963 with the arrival of Pacific Lime, Inc. During the World War II era, the property was part of the US Naval Station and contained a dump with unknown contents (Brown and Caldwell 2009).

2.3 PREVIOUS INVESTIGATIONS

No previous investigations have been performed at the upland portion of the Site; however, a number of previous investigations have been conducted in or near the in-water portion of the Site. These include the 1985 Commencement Bay Near-shore/Tideflats (CBNT) RI, a 2009 sediment investigation conducted by LAI for CanAm, and various other sediment investigations for which data have been submitted to the Ecology Environmental Information Management (EIM) system.

This section presents the results of previous investigations conducted at the Site, as well as the results of grit material analysis performed by Tru-Grit prior to commencing operations at the Facility in the early 1990s.

2.3.1 COMMENCEMENT BAY NEAR-SHORE/TIDEFLATS REMEDIAL INVESTIGATION

During the CBNT RI, sediment samples were collected in eight potential problem areas throughout Commencement Bay, including the Blair Waterway. In comparison with the other problem areas, the Blair Waterway was relatively uncontaminated but still contained chemical concentrations above the reference sites in Carr Inlet. Additionally, sediment toxicity was identified in the Blair Waterway sediment in an area that stretched from the Lincoln Avenue Drain to the former 11th Street Bridge (Figure 1). The largest potential problem area in the Blair Waterway was identified as being adjacent to the Lincoln Avenue Drain, southeast of the site. Two smaller potential problem areas were identified just north and south of the Lincoln Avenue Drain. Concentrations of polycyclic aromatic hydrocarbons, metals such as copper and lead, phenols, polychlorinated biphenyls (PCBs), and phthalate esters were detected in the Blair Waterway (Tetra Tech 1985).

2.3.2 2008 TRU-GRIT SEDIMENT INVESTIGATION

In 2007, during an inspection to verify that the Facility was complying with its National Pollutant Discharge Elimination System Industrial Stormwater General Permit, Ecology noted that grit was present on the ground surface surrounding the ship-to-shore conveyance system and the stacking conveyor, as well as on the adjacent TOTE property and facility now designated at Orion Marine. Ecology issued a Water Quality Enforcement Order (WQEO), which after an appeal settlement required the site stormwater quality to be monitored and reported on, that all exposed grit be swept from upland surfaces, and that all stored grit be covered. The WQEO also required Tru-Grit to comply with the Ecology Toxics Cleanup Program requirements for removal and disposal of contaminated sediment associated with the release of the grit. This specification led Ecology to require an investigation of the sediment surrounding the pier in 2008 (LAI 2009).

In May 2008, LAI collected sediment samples from the marine area adjacent to the Tru-Grit Facility. Seven surface sediment samples were collected as part of this investigation. Five surface sediment samples (i.e., G-1 through G-5) were collected within the vicinity of the pier where grit is offloaded, and two background surface sediment samples (i.e., G-B1 and G-B2) were collected outside the vicinity of the pier. Sample locations are shown on Figure 3.

Visible grit material was identified in surface samples located near the pier where grit was offloaded by Facility operations. Some grit was also present in one of the background samples (G-B1), approximately 130 ft northwest of the end of the pier, which prompted collection of G-B2. Grit was not identified in sample G-B2.

Sediment samples were analyzed for copper and zinc, the two metal constituents in grit material known to exceed screening criteria protective of benthic organisms in sediment (LAI 2009). During this investigation, Ecology collected split samples and analyzed sediment for arsenic in addition to copper and zinc. Chemical analysis of the sediment identified arsenic, copper, and zinc concentrations exceeding the sediment screening criteria protective of benthic organisms, promulgated under the Washington State Sediment Management Standards (SMS). The elevated copper and/or zinc concentrations were detected at locations near the former ship-to-shore conveyor system, principally around the former hopper on the dock. Off-Site background sampling location analytical results also indicated elevated concentrations of zinc and arsenic (G-B2). These exceedances resulted in the Site being placed on the Ecology Hazardous Sites List in 2011.

Arsenic is known to exceed screening criteria in ASARCO slag material but is not found in grit material processed by the Facility (LAI 2009; see Section 2.3.4). Historically, ASARCO slag had a number of uses within the Commencement Bay area, including ballast in log yards and grit for sandblasting (the Property was formerly operated as a shipyard where sandblasting may have occurred).

2.3.3 ENVIRONMENTAL INFORMATION MANAGEMENT DATA

Available EIM data were reviewed (Ecology 2012) identifying the following sediment quality data:

- The 1984 Commencement Bay RI (EIM Study ID CBMSQS) main sediment quality survey detected concentrations of metals such as copper and zinc, low molecular weight polycyclic aromatic hydrocarbons (LPAHs), high molecular weight polycyclic aromatic hydrocarbons (HPAHs), phenols, and volatile organic compounds at multiple sediment sampling locations within the Port waterways, including the Blair Waterway.
- The 1991 Port RI/Natural Resources Damages Assessment (EIM Study ID SITCUMRI) data detected concentrations of metals (including copper and zinc), HPAHs, LPAHs, phthalate esters, and phenols in the sediment located in Commencement Bay, approximately 1 mile downwaterway (northwest) of the Site.
- The 1993 Konioke Pacific Terminal study (EIM Study ID KONPAC93) detected concentrations of copper, zinc, and arsenic at elevated concentrations at one sediment sampling location approximately 0.1 miles ft downwaterway (northwest) of the Site.
- The 1994 Port Blair Bridge (EIM Study ID PTWBLAIR) data recorded concentrations of metals (including copper and zinc) HPAHs, phenols, and phthalate esters at sediment sampling locations approximately 1 mile upwaterway (southeast) of the Site.

2.3.4 CHARACTERIZATION OF GRIT MATERIAL

As noted in Section 2.3, characterization of the grit material was conducted by Tru-Grit when the Facility began operations in the early 1990s. Grit characterization included analysis for total metals, in part to determine if the material would be classified as a hazardous waste using the US Environmental Protection Agency (EPA) Method 1311 Toxicity Characteristic Leaching Procedure (TCLP), two bioassay tests (i.e., the Canadian saltwater stickleback test and the Washington State-prescribed bioassay test for dangerous waste determination [Ecology Method 80-12]). The results of these analyses are presented in Tables 1, 2, and 3.

Additional grit characterization, including total metals and leachate analysis, was conducted as a part of the Supplemental RI in 2018 (see Section 3.2.3).

2.3.4.1 Total Metals

The results of the metals analysis in Table 1 indicated that copper and zinc were the primary metals of concern in the grit material; maximum copper concentrations were 2,590 milligrams per kilogram (mg/kg), while maximum zinc concentrations were 8,930 mg/kg. Arsenic was not detected in the Tru-Grit grit material above the laboratory reporting limit (RL; 0.9 mg/kg), except for one detection of 1.2 mg/kg in a sample collected in 2016.

2.3.4.2 TCLP and Bioassay

The results of the TCLP test and the bioassay tests in Tables 2 and 3 indicated that the material did not classify as hazardous waste (LAI 2013).

3.0 REMEDIAL INVESTIGATION ACTIVITIES

The following sections describe the field methods used for completion of the RI. This investigation was designed to satisfy requirements for an RI as presented in the AO, which is to identify the nature and extent of contamination resulting from operations at the Tru-Grit Facility (i.e., the potential release of grit material to the environment related to Tru-Grit activities only).

Based on the known chemical composition of the grit material and the results of the previous investigation (LAI 2009), the contaminants of potential concern (COPCs) at the Site are the primary metals of concern in the grit material (i.e., copper and zinc). Arsenic is also included as a COPC in sediment because it was detected at the Site during previous investigations. However, arsenic is not present in grit material (Section 2.3.4) and therefore, can be used as an indicator that additional sources of contamination related to the activities of other PLPs are present. Other COPCs common in sediment were screened out based on chemical analysis of surface sediment conducted during the investigation (Section 6.2).

Field activities were completed in accordance with the *Remedial Investigation/Feasibility Study Work Plan, Tru-Grit Facility, Tacoma, Washington*, approved by Ecology (Work Plan; LAI 2013). Additional field activities in 2018 were also completed in accordance with *Supplemental Work Plan, Tru-Grit Facility, Tacoma, Washington* (Supplemental Work Plan; LAI 2018). The results of the Site RI characterization are presented in Section 6.0, Nature and Extent of Contamination.

3.1 INVESTIGATION DESIGN

The RI was designed to evaluate the nature and extent of contamination at the Site. This evaluation included screening potential source discharge areas that may have contributed to the release of grit material to the environment. The Work Plan identified six potential source discharge areas, described below:

- **Barge Offloading Area**. During barge offloading, grit material was spilled into the waterway from the barge or by the ship-to-shore conveyor system. Grit material from this potential source area may have affected sediment quality (through direct contact).
- **Material Storage Areas**. Grit material is stored on paved areas at the Facility and is not in direct contact with soil. However, between 2005 and 2007, some grit was temporarily stored on an unpaved area of the adjacent Orion Marine. Grit material from this potential discharge source could have affected soil quality (through direct contact), groundwater quality (through infiltration), or surface water quality (through the discharge of potentially impacted groundwater or stormwater).
- **Rooftops**. Airborne fines that may have collected on the roof of the Facility maintenance building could be washed down with rainwater. Grit material from this potential source area may have affected soil or near-shore sediment quality (via runoff), groundwater quality (through infiltration), or surface water quality (through the discharge of impacted groundwater or limited surface flow).

- **Stormwater Infiltration Pond**. The former stormwater pond at the Facility infiltrated stormwater directly to the subsurface. Grit material from this potential discharge source could have affected soil quality (through direct contact), groundwater quality (through infiltration), or surface water quality (through the discharge of impacted groundwater).
- **Material Processing**. The material processing operations generate dust. This dust may migrate to areas that discharge stormwater to the waterway (such as rooftops and adjacent paved properties). Grit material from this potential discharge source could have affected near-shore sediment quality (through direct discharge), or surface water quality (through direct discharge).
- **Adjacent Property's Storm Drain System**. Airborne fines may have collected on the adjacent TOTE property, where stormwater runoff previously discharged to the Blair Waterway via Outfall 4. Grit material from this potential discharge source could have impacted near-shore sediment quality (through direct contact). Because stormwater is no longer discharged at this outfall, this source would not currently impact surface water quality.

Based on the results of the previous investigation completed at the Site (LAI 2009) and the six identified potential source discharge areas above, the following three overall areas of concern were identified:

- **Upland Area**. This area includes the Facility and portions of Orion Marine where grit material was temporarily stored.
- **Beach Area**. This area includes the near-shore intertidal zone.
- **Blair Waterway Area**. This area includes the in-water portion of the Site, outside of the Beach Area.

The following sections describe the RI activities and how they were designed to evaluate the contributions of one or more of the six potential discharge source areas.

3.2 UPLAND AREA

The Upland Area investigation included collecting surface soil and groundwater seep samples. Sample collection procedures and analyses are described in the following sections.

3.2.1 SOIL SAMPLE COLLECTION AND ANALYSIS

On April 18, 2013, surface soil samples were collected from six locations, identified as U-1 through U-6. Soil samples were collected from two locations in the unpaved portion of the Facility (between the maintenance building and the shoreline), from one location in the stormwater overflow area (near the edge of the former stormwater infiltration pond), and from three locations within unpaved areas at Orion Marine (Figure 3).

These three upland areas investigated are the only areas where grit material could have been in direct contact with soil at the Site; the balance of the Facility (other than the vegetated strip of land between

the maintenance building and the shoreline) was paved by Tru-Grit before beginning operations (LAI 2013). The upland sample locations were chosen to evaluate potential adverse impacts to soil quality from three potential discharge sources (i.e., the material storage areas, the rooftop of the Tru-Grit maintenance building, and the former stormwater infiltration pond).

At each sample location, the intended location was confirmed with a hand-held GPS. A pick was used to break the soil surface, if necessary, and a small trowel was used to excavate soil to the appropriate maximum sampling depth (6 inches). Soil was then scraped from the sidewalls of the excavation using a decontaminated, stainless-steel spoon, exposing a fresh surface. Soil was collected with a stainless-steel spoon, homogenized in a stainless-steel bowl, and placed in laboratory-supplied sampling containers. Sampling implements were decontaminated before each sampling location using an Alconox® wash and scrub followed by a de-ionized water rinse. Soil samples were transported to the laboratory, TestAmerica Laboratories, Inc. (TestAmerica), located in Tacoma, Washington, under proper chain-of-custody (COC) procedures. Soil samples were analyzed for total copper and zinc using EPA Method 6020.

3.2.2 SEEP SAMPLE COLLECTION AND ANALYSIS

On April 18, 2013, water samples were collected from two seeps along the shoreline, identified as Seep-1 and Seep-2 (Figure 3). Additional seep samples were collected from the sampling location Seep-2 on May 17 and September 7, 2018. These sample locations were chosen to evaluate potential adverse impacts to groundwater via infiltration from three potential discharge source areas (i.e., the material storage areas, the rooftop of the Tru-Grit maintenance building, and the former stormwater infiltration pond). Seep sample locations were hydraulically downgradient of upland soil samples U-1 and U-3; these upland soil sample locations are adjacent to the Beach Area and directly beneath drains from the rooftop of the Facility's maintenance building (Figure 3). Seep samples were collected from the shoreline above the marine water elevation at the time of sampling. Initial samples were collected during an approximately 4.0 ft tide. Field parameters measured during sampling indicated a conductivity of between approximately 7,000 microsiemens per centimeter (µS/cm) and 9,200 µS/cm, which is well below expected conductivity of seawater (about 50,000 µS/cm).

Samples were collected during a low tide when the intertidal area adjacent to the upland portion of the Site was exposed. At each sample location, seep water was temporarily diverted into a clean 16-ounce glass sample container. Samples were pumped from this temporary containment using a peristaltic pump, through a dedicated 0.45-micron filter and into laboratory-supplied sampling containers. Samples were preserved with nitric acid in accordance with dissolved metals sampling protocols and transported to TestAmerica under proper COC procedures. Samples collected in 2013 were analyzed for dissolved copper and zinc using EPA Method 6020; samples collected in 2018 were analyzed for dissolved copper only.

3.2.3 ADDITIONAL GRIT CHARACTERIZATION

Additional characterization of the grit material was conducted in January 2018. Grit characterization included analysis of three grab samples for total copper and synthetic precipitation leaching procedure (SPLP) to determine the leaching potential of material handled at the Site. The samples were collected from three individual piles of grit material stored at the Site at the time of sampling. The results of these analyses are presented in Table 1.

3.2.3.1 Total Metals Analysis

The results of the metals analysis by EPA SW-846 Method 6020A indicated copper concentrations of 1,900 mg/kg (two samples) and 1,800 mg/kg. These results were comparable to previous grit characterization data, which indicated a range of copper concentration between 1,000 mg/kg and 2,590 mg/kg.

3.2.3.2 SPLP Analysis

The raw grit sample was subjected to SPLP by using EPA SW-846 Method 1312. This method is designed to simulate exposure to precipitation by exposing the sample to liquid with a similar pH to rainfall. The liquid (leachate) is then extracted and analyzed. The extraction fluid utilized during this test was water with a pH of approximately 5, which is intended to simulate the pH of acidified rainfall. Leachate was then analyzed for dissolved copper by EPA Method 6020.

The results of the SPLP test indicated leachate concentrations of 0.041 milligrams per liter (mg/L), 0.10 mg/L, and 0.11 mg/L. Because SPLP uses an extraction procedure with a pH below that of surface water, the results are not directly indicative of leaching potential in surface water.

3.3 BEACH AREA

The Beach Area investigation included the collection of near-shore surface sediment samples. On January 14, 2014, six surface sediment samples were collected from the Beach Area (i.e., SG-01 through SG04, SG-23, and SG-24). This area includes the intertidal zone underneath the pier at the adjacent Orion Marine, the intertidal zone directly adjacent to the Facility, and the intertidal zone near Outfall 4. These locations were chosen to evaluate potential adverse impacts to near-shore sediment quality from discharge of the ship-to-shore conveyance system spills (under the pier), airborne grit material fines washed off the roof of the maintenance building (directly adjacent to the Facility), or from historical discharges of stormwater from the TOTE terminal (near Outfall 4).

Samples were collected during a low tide when the intertidal zone was exposed. At each sample location, the location was confirmed with a hand-held GPS. A small trowel was used to excavate sediment to the appropriate maximum sampling depth (10 centimeters [cm]). Sediment was then scraped from the sidewalls of the excavation using a decontaminated, stainless-steel spoon, exposing a fresh surface. Sediment was collected with a stainless-steel spoon, homogenized in a stainless-steel bowl, and placed in laboratory-supplied sampling containers. Sampling implements were decontaminated before each sampling location using an Alconox wash and scrub followed by a de-ionized water rinse. Samples were transported to TestAmerica under proper COC procedures. Samples were analyzed for total arsenic, copper, and zinc using EPA Method 6020.

3.4 BLAIR WATERWAY AREA

The Blair Waterway Area investigation included collecting surface and subsurface sediment samples, and marine surface water samples. Sample collection procedures and analyses are described in the following sections.

3.4.1 SURFACE SEDIMENT SAMPLE COLLECTION AND ANALYSIS

Surface sediment samples were collected in 2014 and 2018, as described in the following sections. In general, surface samples were collected with a pneumatic power grab system provided and operated by the subcontractor, Research Support Services, Inc. (RSS) of Bainbridge Island, Washington. Sample locations were identified using a differential global positioning system (DGPS), mounted on the sample collection system. Vertical position was measured using a weighted tape to measure from the water surface to the sediment surface. Mudline elevations at each sample location, as well as station coordinates, are provided in Table 4. Sample locations are shown on Figure 3.

Surface sediment samples were collected from the uppermost 10 cm of the sediment in the sampler (the predominantly biologically active zone) and from an area large enough to provide adequate sample volume while excluding sediment that was in contact with the sampler. For samples where large volumes were needed (approximately 10 liters for 2018 samples), a second grab was collected immediately adjacent (not overlapping but less than 5 ft) from the initial grab location. Large, unrepresentative material (e.g., shells, woody debris) was excluded from the sample. Sediment was then homogenized to obtain a smooth consistency (based on color and texture) in stainless steel bowls, using a stainless-steel spoon. Sediment was characterized on the field sample collection forms. This characterization included color, odor, sheen, grain size, and a soil description consistent with the Unified Soil Classification System (USCS). After characterization, the sediment was placed into laboratory-supplied containers, placed on ice, and stored in

coolers at approximately 4 degrees Celsius (°C). Samples were transported to TestAmerica under proper COC procedures.

Following collection of samples for analysis, a representative sample of sediment from each location was sieved and dried each evening after daily field activities and observed under a microscope to screen for the presence of grit material.

Field sampling equipment, including the pneumatic power grab sampler, stainless steel bowls, and stainless-steel spoons were decontaminated between sampling locations. A record of field activities was prepared during the investigation including field notes, sampling forms, and sample COC forms.

3.4.1.1 2014 Surface Sediment Sample Collection and Analysis

On January 14 and 15, 2014, surface sediment samples were collected at 18 locations at the Site. These locations were identified as SG-05 through SG-22 and were distributed over an approximately 60,000-square foot (sf) area. These locations were chosen to evaluate potential adverse impacts to sediment from direct discharge of grit material to the waterway from barge offloading activities, material processing operations, or from the adjacent property's storm drain system. Two additional surface sediment sample locations (i.e., BSG-1 and BSG-2), located relatively upgradient and downgradient of the Facility, were collected to evaluate background metals concentrations within the waterway. Based on a preliminary assessment of grit material in sediment during sampling activities, four additional step-out sediment surface samples (i.e., SG-25 through SG-28) were collected on January 16, 2014. Field logs, including approximate mudline elevations and sediment descriptions, are included in Appendix A.

To screen out other COPCs at the Site, two surface samples (locations SG-10 and SG-13) were analyzed for the full suite of constituents identified in the SMS (WAC 173-204) for marine sediment. This list includes metals (i.e., arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc), PCBs, and semivolatile organic compounds (SVOCs). Analysis of the full suite of SMS constituents also supports Ecology's general approach for evaluation of sediment sites and potential COPCs. Locations SG-10 and SG-13 were originally identified in the Work Plan in areas suspected of having surface sediment with higher grit content based on their proximity to the offloading operation and on previous characterization of surface sediment in 2008. After characterization and sieving of the samples was completed, it was determined that these surface sample locations had only moderate grit content compared to other sampling locations. Nevertheless, the analytical results at these two locations are relevant for screening of potential additional COPCs in surface sediment because of their proximity to the offloading operation and because the specific constituents of the grit material used at the Facility have also been previously analyzed and can be used for interpretation of sediment quality.

3.4.1.2 2018 Surface Sediment Sample Collection and Analysis

On January 25, 2018, surface sediment samples were collected from four previously tested locations at the site (G-5, SG-14, SG-16, and SG-17) to evaluate the potential benthic toxicity of elevated copper and zinc concentrations resulting from potential Tru-Grit operations in surface sediment. These locations were selected from existing 2014 surface sediment sample locations potentially impacted by Tru-Grit's operations, as indicated by 2014 data. Indications of potential Tru-Grit impact include the following:

- Proximity to ship-to-shore offloading conveyance system and west of the offloading area
- Elevated percentages of grit material in surface sediments
- Elevated concentrations of copper and/or zinc in surface sediments
- Relatively low concentrations of arsenic in surface sediments.

Chemical analysis of the sediment samples for the full suite of SMS chemicals was conducted prior to conducting the bioassay. Sample location SG-17 exhibited elevated arsenic concentrations unrelated to releases from the Tru-Grit operation, and Ecology gave permission to exclude that sample from the bioassay analysis. However, the property owner (Port) requested the bioassay be conducted on the SG-17 sample. Ecology subsequently requested that the SG-17 bioassay results be included in this report.

One reference sediment sample was also collected from Carr Inlet for quality assurance and quality control (QC) purposes for bioassay testing. This sampling location was selected in accordance with sediment bioassay reference area guidelines in Puget Sound Estuary Program (PESP) Guidance (Ecology 2015).

Field grain size wet sieving was conducted at the time of sampling to determine the fines content of each sample for the purpose of selecting an appropriate reference sediment sample to utilize during bioassay testing. Field grain size wet sieving procedures are outlined in the Supplemental Work Plan. Field logs, including approximate mudline elevations and sediment descriptions, are included in Appendix A

3.4.2 SUBSURFACE SEDIMENT SAMPLE COLLECTION, PROCESSING, AND ANALYSIS

Between January 16 and 21, 2014, subsurface sediment cores were collected from 12 locations. Ten locations were chosen to evaluate potential adverse impacts to sediment from one potential discharge source (i.e., accidental discharge of grit material to the waterway during barge offloading activities). These locations were based on preliminary identification of grit material in co-located surface sediment samples (i.e., SG-05, SG-07, SG-08, SG-09, SG-10, SG-12, SG-13, SG-14, SG-16, and SG-17). Core locations were distinguished from the co-located surface samples with the prefix SC- (for example, core SC-05 was co-located with surface sample SG-05). One core location (designated G-5) was co-located with a surface sample location (GS-5) from the 2008 investigation, where significant quantities of grit had been identified

near the end of the conveyor pier. A surface sample was not collected from this location because analysis was performed on surface sediment in 2009. One additional core location (i.e., SC-14A) was added during field activities to evaluate a distinct grit material (described below). Another additional subsurface sediment location (i.e., BSC-1), co-located with BSG-1, was collected to evaluate background metals concentrations within the waterway.

Sediment subsurface core samples were collected with a vibracoring system, provided and operated by the subcontractor, RSS. Sampling locations were identified using DGPS, mounted on the sample collection system. Vertical position was measured using a weighted tape to measure from the water surface to the sediment surface. Mudline elevations at each sample location, as well as station coordinates, are provided in Table 4. Sample locations are shown on Figures 3 and 7.

Sediment cores were collected as described in the Work Plan, with the following exceptions:

- With the concurrence of Ecology (Mercuri 2014), the minimum acceptable core recovery percentage was reduced from 75 percent to 65 percent after core collection of one sample (SC-12; 66 percent recovery) for which two unsuccessful attempts had been made. This change was based on field observations, including the successful closure of the core catching apparatus and the relative density (generally higher than upper sediment, but not stiff) of sediment at depth. This material was interpreted to indicate that variable recovery percentage was likely due to variable compaction of sediment within the core, rather than lost material from the core tube during retrieval or plugging (in which increased friction within the core tube exceeds the bearing strength of underlying material, preventing further acquisition). Seven of the 12 cores achieved greater than 75 percent recovery as planned. Four cores (i.e., SC-05, SC-09, SC-17, and BSC-1) achieved greater than 70 percent recovery.
- During subsurface sediment core collection at proposed location SC-14 (intended to be co-located with surface sample location SG-14), refusal was met at approximately 3 ft below the sediment surface. When the core tube was retrieved, a large, consolidated piece of clay-like sediment was retained in the core nose. The consolidated material, which appeared to contain grit material as well as other debris including paint chips, was retained for observation and analysis and the location was designated as SC-14A. Another attempt was made approximately 5 ft to the south of the intended location, designated as location SC-14B. Refusal was met at this location at approximately 3 ft below the sediment surface and similar material was retained in the core nose but was not retained for analysis. To attempt to delineate the extent of the hardened sediment layer, the vibracorer was used to probe an area approximately 30 ft southeast of the intended location, designated as location SC-14C; at this location, the vibracorer met refusal at approximately 3 ft below the sediment surface, though no material was retained in the core nose. A barge, docked at this location, prevented further exploration to the southeast. A final attempt (i.e., location SC-14) was made, approximately 15 ft to the southwest of the intended location. Refusal was met at 7 ft below the sediment surface. No hardened clay-like material was retained in the core nose; however, the action of the vibracorer when it met refusal was consistent with its previous behavior when the hardened layer was encountered. This core was retained for analysis. These additional core locations are shown on Figure 3, and a boring log of the final attempt location (SC-14) is included in Appendix A.

Sediment cores were stored on ice at approximately 4°C and transported to TestAmerica for processing by LAI personnel after the completion of field activities. Sediment cores SC-10 and SC-12 were

processed on the sampling vessel on the day of sample collection. Sediment samples were collected from the cores during processing using the procedures described in the Work Plan (LAI 2013). Sediment cores were logged and characterized on sediment exploration log forms; characterization included unit contacts, sediment color, odor, sheen, grain size, and a sediment description consistent with the USCS. Sediment exploration logs are presented in Appendix A.

Two samples were collected from each core for analysis. One sample was collected from the portion of the core with the highest apparent grit content, if present (based on visual observation). The second sample was collected from a 1-ft interval beneath where grit was visible. In most cores, grit was not readily apparent during processing. In this event, one sample was collected from between 1 and 2 ft, and the second sample was collected from between 2 and 3 ft. The remaining portions of the cores were divided into 1-ft lengths and collected for archival at the laboratory.

Large, unrepresentative material (e.g., shells, woody debris) was excluded from the samples. Sediment was homogenized to obtain a smooth consistency (based on color and texture) in stainless steel bowls, using a stainless-steel spoon. Sediment was then placed into laboratory-supplied containers and stored in the laboratory walk-in cooler at approximately 4°C. Sample custody was transferred to the laboratory under standard COC procedures. Sediment samples submitted were analyzed for copper, zinc, and arsenic by EPA Method 6020.

Sediment processing equipment, including the stainless-steel bowls and spoons, was decontaminated between samples. To positively identify grit material at depth, the remaining sample volume from cores G-5, SC-12, SC-13, SC-14, SC-16, and SC-17 were dried by TestAmerica and sieved with a No. 200 sieve. This sediment was observed with a microscope to determine approximate grit content.

3.4.3 MARINE SURFACE WATER SAMPLE COLLECTION AND ANALYSIS

Marine surface water samples were collected on January 25, 2018, which was the same day as the 2018 surface sediment sample collection. Marine surface water was collected from two locations: one approximately 60 ft from the base of the riprap on the shoreline and another approximately 120 ft from the base of the riprap on the shoreline. Samples were collected from a depth of approximately 1 meter (m) below the water surface.

Surface water samples for dissolved copper were collected using a peristaltic pump and dedicated sample tubing. Tubing was connected to the peristaltic pump and extended to the recommended sampling depth (1 m) by tying it to a pole. Sample tubing was fitted with an inline 0.45-micron filter to remove suspended particles.

Surface water samples were analyzed for dissolved copper by EPA Method 6020. Reporting limits for EPA Method 6020, which is the most sensitive method available from the analytical laboratory, exceed

the project screening level for dissolved copper of 2.4 mg/L; thus, results are reported down to the method detection limit.

3.5 QUALITY ASSURANCE

Soil, groundwater, and sediment samples were analyzed and the results validated according to the quality assurance/QC procedures described in the Work Plan and associated Sampling and Analysis Plan (SAP; LAI 2013). QC for the project included maintaining a COC record for each set of samples submitted to the laboratory, proper storage and preservation of the samples, equipment decontamination, and analysis of QC samples, in accordance with the SAP. Blind field duplicates were collected for groundwater and marine sediment samples. Field duplicate sample frequency was 1 per 20 samples, or at least 1 per sampling event for arsenic, copper, and zinc. For sediment and groundwater, the main sample and duplicate sample were collected by alternately filling sample containers between the main and duplicate sample. One matrix spike and matrix spike duplicate sample was collected for marine sediment samples.

An internal data quality evaluation was performed by LAI on the soil, groundwater, and sediment analytical data collected as part of the RI to determine acceptability of the analytical results. The data quality evaluation conducted included the following review:

- COC records
- Holding times
- Laboratory method blanks
- Laboratory control samples
- Laboratory matrix spikes and matrix spike duplicates
- Laboratory duplicates
- Surrogate recoveries
- Completeness
- Overall assessment of data quality.

Laboratory packages are provided in Appendix B; the 2018 bioassay report is included in Appendix C. The data were determined to be acceptable for use and no data were rejected, with the following exceptions:

- January 25, 2018 results for di-n-octyl phthalate at sampling location G-5 were rejected due to a low matrix spike duplicate recovery. However, di-n-octyl phthalate was not detected in any of the 2018 samples at concentrations above the laboratory reporting limits.

4.0 ENVIRONMENTAL SETTING

This section describes the environmental setting and physical conditions at the Site. These characteristics are relevant because they have the potential to affect the fate and transport of contaminants and include the following:

- Site topography and bathymetry
- Geology
- Hydrogeology
- Drainage and stormwater
- Sediment deposition
- Natural resources.

4.1 SITE TOPOGRAPHY AND BATHYMETRY

The Upland Area of the Site comprises approximately 0.8 acres landward from the ordinary high water mark. The elevation of this area is approximately 10 ft National Geodetic Vertical Datum of 1929 (NGVD29) or approximately 16 ft mean lower low water (MLLW). Topography at the Site is level until it reaches the shoreline, where elevation drops off as a steep riprap slope toward the waterway.

The in-water portion of the Site comprises approximately 0.6 acres and includes the Beach Area and the Blair Waterway Area. The shoreline is armored with riprap that extends from the top of the bank (approximately 14 ft MLLW) into the intertidal zone to approximately 3 ft MLLW. Below the riprap, the intertidal zone (Beach Area) comprises a sand beach with large rock material interbedded sporadically. The beach slopes gradually from an elevation of approximately 3 ft MLLW to approximately -4 ft MLLW. The bathymetry then steepens with a mudline elevation ranging between approximately –4 ft MLLW to the current dredge depth of the navigation channel, which is approximately –52 ft MLLW. Directly southwest of the Site, the bathymetric slope levels at the Site parcel boundary at approximately –30 ft MLLW, before steepening again to the navigation channel depth.

4.2 GEOLOGY

The Site lies within the present-day Puyallup River delta complex, which makes up the Port tideflats. The delta complex is bounded on the southwest and northeast by steeply sloping hillsides composed of consolidated glacial and interglacial deposits. The delta soils are a layered sequence of silts and fine-to-medium sands deposited by alluvial and estuarine processes. Before development, the tideflats (defined as the shoreline to lower low water line) extended to the current mouth of the Blair Waterway (Bortleson et al. 1980).

In 1877, prior to development of the Port, the shoreline in the vicinity of the Blair Waterway was located about ⅛ to ¼ mile southeast of the Site (Bortleson et al. 1980). Wapato Creek likely entered the delta near the south end of the existing Blair Waterway. With the development of the area, the Blair Waterway (along with the other waterways within the Port) was created by dredging in the mid-20th Century. Dredged materials and imported fill were generally placed in the tidelands, near-shore, and upland areas to establish the current topography.

Specific geologic conditions in the vicinity of the Site include a surficial fill unit (imported fill underlain by dredge fill), comprised of sand with silt and silty sand, which extends from the surface to an approximate elevation of 0 ft MLLW. Native interbedded silt and sand units typical of delta deposits underlie the fill unit. Delta deposits extend to depths greater than –215 ft MLLW (GeoEngineers 2008).

4.3 HYDROGEOLOGY

Groundwater is present in the surficial fill unit as an unconfined groundwater zone. In this unit, groundwater flow is generally from the center of the peninsula toward the Blair Waterway and the Hylebos Waterway, with groundwater discharge to the waterways. Groundwater flow in the surficial fill unit is strongly influenced by the pattern and drainage direction of pre-filling tideflat drainages (Bortleson et al. 1980). Water levels measured at the TOTE terminal indicate groundwater nearby the site is located at an elevation of approximately 9 ft MLLW (GeoEngineers 2008), or 2.7 ft NGVD29, which is approximately 7 ft below ground surface.

Native silt layers in the delta deposits restrict vertical flow and divide groundwater zones. Groundwater within the delta deposits occurs in semi-confined and confined conditions in the sand units with interbedded silt layers restricting vertical flow. Groundwater elevations in the shallow portions of the delta deposits are influenced by tidal conditions. During a September 17, 2012 site visit, numerous groundwater seeps were evident at the base of the riprap slope (approximately 3 ft North American Vertical Datum 1988) providing evidence of groundwater flow toward the waterway.

4.4 DRAINAGE AND STORMWATER

No natural surface water features are present within the Upland Area of the Site. Prior to commencing plant operations, Tru-Grit paved the entire Facility (with the exception of a vegetated strip on the waterway side of the maintenance building) and installed a stormwater collection system. The stormwater system collects water from the Facility (with the exception of the unpaved areas) and routes it to a series of catch basins. Historically, stormwater from the catch basins was piped and infiltrated into a small, riprap-lined infiltration pond located on the south side of the maintenance building. The settling pond had an overflow swale that would allow stormwater to discharge to the shoreline in the event the basin

was overtopped; however, one of the plant operators who has worked at the Facility since it began operating indicated that stormwater has never overtopped the basin, even during the biggest storm events (Streight 2012). Currently, stormwater is directed to a series of holding tanks that sit on top of the former settling pond and are connected to an evaporation system (Figure 3).

Drainage from the northeast side of the maintenance building roof is directed to the paved area, which drains to the catch basin system. Drainage from the southwest side of the roof discharges to the strip of vegetated ground between the building and the shoreline via roof drains where it either infiltrates to the subsurface or flows over land to the shoreline.

No stormwater collection system is present on the Orion Marine portion of the Property; rainwater ponds and infiltrates. A brief inspection of the Orion Marine portion of the Property did not reveal any storm drains (LAI 2013).

4.5 SEDIMENT DEPOSITION

The marine environment in the Blair Waterway is influenced by semi-diurnal tidal cycles with a mean tidal range of 8.1 ft (Tetra Tech 1985). Discharge of the Puyallup River to the southwest influences the depositional nature and grain size of sediments in the Blair Waterway. A Port engineer involved with dredging projects indicated shoaling is the primary process affecting sediments in the Blair Waterway (Hooton 2012). Documentation of sediment deposition rates specific to the Blair Waterway could not be located for this report; however, in 1988, Ecology began monitoring deposition in sediment traps in the Thea Foss waterway (within Commencement Bay) and calculated yearly sediment accumulation rates. This monitoring was expanded to include the Hylebos and Sitcum waterways in 1990 (Ecology 1996).

Ecology predicted average yearly sediment accumulation rates based on measured gross accumulation rates for the three waterways. Between 1991 and 1995, calculated sediment accumulation rates in the Hylebos and Thea Foss waterways had mean accumulation rates of 3.4 centimeters per year (cm/yr) and 2.5 cm/yr, respectively (Ecology 1996). The Sitcum waterway was excluded due to its proximity to the discharge point for the Puyallup River, which might result in an overestimate of accumulation rates. Since these accumulation rates were predicted for the routinely dredged areas of the waterway, accumulation at the edges of the waterways would be expected to be lower due to slower current and lower sediment loads in these areas. The mean accumulation rate for the two waterways taken together is 3.0 cm/yr. Based on this mean accumulation rate, total sediment deposition at the Site since Tru-Grit began operations (approximately 24 years) may be expected to be less than 2.4 ft. Some mixing of these accumulated sediments is expected due to potential prop wash conditions in the area. However, based on a prop wash study completed for Portland Harbor (EPA 2016), prop wash effects are expected to be limited to the upper 0.5 ft of sediment.

4.6 NATURAL RESOURCES

The upland portion of the Facility is approximately 0.8 acres in size. The only undeveloped area is a narrow vegetated strip (approximately 0.04 acres) between the building and the shoreline. The remainder of the site is paved or covered by buildings. No other undeveloped land is located within 500 ft of the site. In accordance with WAC 173-340-7491(1)(c)(i), sites that contain less than 1.5 acres of contiguous undeveloped area are excluded from having to conduct a terrestrial ecological evaluation. The Ecology Terrestrial Ecological Evaluation Exclusion form is included as Appendix D. As the Blair Waterway is adjacent to Commencement Bay and the greater Puget Sound, there is the potential for anadromous fish species, in the in-water portion of the Site, including steelhead trout, chinook salmon, coho salmon, and bull trout. The Blair Waterway is not listed as containing Priority Habitat or Species.

5.0 PRELIMINARY SITE SCREENING LEVELS

PSLs were developed for the media of concern at the Site (i.e., soil, groundwater, and sediment) and were presented in the RI Work Plan (LAI 2013). Current and future land use, potential contaminant sources, affected media, exposure pathways, and potential receptors at the Site were presented in the preliminary CSM included as part of the Work Plan. The CSM was used to develop PSLs, which were then used to select appropriate method detection limits and RLs for chemical analysis during investigation activities.

The findings of the RI will be used in Section 7.0, Conceptual Site Model, to add, refine, or eliminate potential sources, affected media, exposure pathways, and receptors, as appropriate. The updated CSM will be used to develop Site-specific CULs as part of the FS. A short summary of the potential exposure pathways and receptors used to develop PSLs is provided below.

5.1 POTENTIAL EXPOSURE PATHWAYS

Potentially complete exposure pathways that were evaluated during the development of the PSLs and were presented in the RI Work Plan included the following:

- **Direct human contact with soil**. Humans could be exposed to contaminated soil along the shoreline and during construction involving intrusive activities.
- **Groundwater discharge to surface water**. Discharge of contaminated groundwater to surface water could affect aquatic receptors in surface water or benthic organisms in sediment.
- **Toxicity of contaminants in sediment to benthic organism**s. Contaminants released to the biologically active zone of sediment (the upper 10 cm below the mudline) could cause harm to benthic organisms through toxic effects.
- **Bioaccumulative effects to benthic and aquatic organisms**. Arsenic in sediment may bioaccumulate in benthic and aquatic organisms. Zinc and copper are not known to be bioaccumulative.

In accordance with WAC 173-340-720(2)(d), because of its proximity to marine surface water (which is not a suitable domestic water supply), ingestion of groundwater is not considered a potentially complete exposure pathway at this Site.

5.2 POTENTIAL RECEPTORS

Based on the current and likely future land uses of the Site (i.e., industrial), potential human and ecological receptors were identified, which included Site workers, construction workers, visitors, benthic organisms, and aquatic organisms. Human consumption of aquatic organisms could also be a potential receptor for bioaccumulative chemicals (arsenic). However, as arsenic impacts to sediment are not related to Tru-Grit operations, and none of the constituents of concern from Tru-Grit operations are

bioaccumulative, human consumption of aquatic organisms is not included as a potential receptor in this RI.

Due to the restricted nature of Site access (a private industrial facility with no public access points), potential human receptors at the Site were limited to Site workers, construction workers, and visitors. Potential exposure of human receptors to contaminants in surface soil could occur through ingestion or dermal contact.

The Site is excluded from a terrestrial ecological evaluation based on the heavily developed nature of the Upland Area, in accordance with WAC 173-340-7491(1)(c)(i) (see Section 4.6). Based on this exclusion, potential ecological receptors at the Site were limited to benthic organisms and aquatic organisms. Benthic communities present in the upper 10 cm of sediment within the Blair Waterway could be exposed to contaminants in sediment. Fish species present in marine surface water adjacent to the Site could be exposed to contaminants in surface water.

5.3 PRELIMINARY SCREENING LEVELS

PSLs for soil, groundwater, and sediment protective of human and ecological receptors were developed for copper and zinc, the COPCs present in the grit material. Arsenic is also included as a COPC in Site sediment because it was detected at the Site during previous investigations. The potential for surface water contamination was addressed through the development of groundwater PSLs protective of surface water rather than developing surface water PSLs directly.

5.3.1 SOIL AND GROUNDWATER PRELIMINARY SCREENING LEVELS

MTCA provides three approaches for establishing soil and groundwater CULs: Methods A, B, and C. The Method A approach is appropriate for sites that have few hazardous constituents; while the Tru-Grit site meets this criteria, Method A values for copper and zinc are not provided in the MTCA regulation. The Method B approach is applicable to all sites. The Method C approach is applicable for specific site uses and conditions. The Method B and Method C approaches use applicable state and federal laws and risk equations to establish CULs. However, the Method B approach establishes CULs using exposure assumptions and risk levels for unrestricted land uses, whereas the Method C approach uses exposure assumptions and risk levels for restricted land uses. The Method B approach was used for the development of soil PSLs, and soil PSLs are presented for protection of both human health by direct contact and for protection of groundwater as surface water. The Method B approach was also used for the development of groundwater PSLs, and groundwater PSLs are presented for protection of surface water and drinking water. PSLs for soil and groundwater are presented in Tables 5 and 6, respectively.

5.3.2 SEDIMENT PRELIMINARY SCREENING LEVELS

Sediment cleanup standards are set forth under the SMS (WAC 173-204). Under WAC 173-204-562, chemical criteria are set forth for the protection of the benthic community in marine sediment. The SMS provides a method for establishing site-specific sediment CULs within a range bounded by the lower Sediment Cleanup Objective (SCO) and the higher Cleanup Screening Level (CSL). The preliminary sediment CUL for a site is initially set at the SCO. Based on the findings of the RI/FS process, the final sediment CUL for the site may be adjusted upward from the SCO, as appropriate, but may never be adjusted higher than the CSL. PSLs for sediment were established at the SCO screening level values for protection of the benthic community (Draft Sediment Cleanup User's Manual II; Ecology 2013). PSLs for sediment COPCs (i.e., arsenic, copper, and zinc) are presented in Table 7. Under the SMS, sediments may also be evaluated for protection of the benthic community using bioassay tests. Bioassay results are compared to both the SCO and CSL, which are defined by mean mortality rates (amphipod test), mean individual growth (juvenile polychaete test), and mean normal survival (larval test). These SCO and CSL values are detailed in Appendix C, and are summarized as follows:

- Amphipod Test: mean mortality of >25% (SCO) and >30% (CSL), if the difference between the mean mortality in the treatment sample and the reference sample is statistically significant.
- Juvenile Polychaete Test: ratio of mean individual growth of the treatment sample and the reference sample is <0.70 (SCO) and <0.50 (SCL), if the difference between the mean individual grown in the treatment sample and the reference sample is statistically significant.
- Larval Test: ratio of normal larval development of the treatment sample and the reference sample is <0.85 (SCO) and <0.70 (CSL), if the difference between the normal larval development in the treatment sample and the reference sample is statistically significant.

6.0 NATURE AND EXTENT OF CONTAMINATION

The RI was designed to evaluate the nature and extent of contamination potentially resulting from Tru-Grit operations and to identify discharge sources to the environment. Areas of suspected contamination were investigated to better define the limits of known contamination. During the RI, six surface soil samples, two groundwater seep samples, 28 surface sediment samples, and 25 subsurface sediment samples were collected and analyzed.

6.1 SOIL QUALITY

Surface soil samples were collected from six locations on unpaved portions of the Site where grit material may have affected soil quality. Because the Site is almost entirely paved (Section 3.2.1), these sample locations were the only areas where grit material could have been directly in contact with soil. Sample locations were chosen to evaluate three potential discharge sources including the material storage areas, the rooftop of the Tru-Grit maintenance building, and the former stormwater infiltration pond.

Because of the proximity of the Blair Waterway, PSLs for soil considered discharge of groundwater to marine surface water (Section 5.3). As described in the Work Plan, concentrations in surface soil samples in excess of the concentrations considered to be protective of groundwater as surface water triggered groundwater monitoring at the seep locations. This monitoring was designed to offer an empirical demonstration (in accordance with WAC 173-340-747), as to whether copper and zinc may be leaching to groundwater. Dissolved metals concentrations less than groundwater PSLs, would confirm that contaminant concentrations in soil are not adversely impacting surface water via groundwater, and, as described in the Work Plan, Site Upland soil PSLs would be updated to concentrations protective of human health by direct contact. Groundwater sampling, described in the following section, confirmed that copper and zinc concentrations in soil are not causing exceedances of the groundwater PSLs. Therefore, the soil PSLs are set at the MTCA Method C concentration protective of direct human contact.

Copper concentrations in soil ranged from 34 mg/kg to 120 mg/kg and zinc concentrations in soil ranged from 76 mg/kg to 310 mg/kg. None of the concentrations exceeded the soil PSLs for copper and zinc of 3,200 mg/kg and 24,000 mg/kg, respectively. Soil sampling locations are shown on Figure 4; soil sample analytical results are provided in Table 8.

6.2 GROUNDWATER AND MARINE WATER QUALITY

As noted previously, soil concentrations exceeding PSLs for protection of surface water triggered an evaluation of groundwater quality at the Site; groundwater quality was evaluated with the collection of two seep samples along the shoreline, downgradient of soil sample locations U-1 and U-3. Additionally,

marine water samples were collected in 2018 to evaluate potential contributions to groundwater concentrations from marine water.

All concentrations of copper and zinc in groundwater were below the PSLs with the exception of copper in the Seep-2 sample during the initial sampling event in 2013; the sample concentration was 0.0095 mg/L compared to the PSL of 0.0024 mg/L. Analysis of copper in marine water can have significant matrix interference issues resulting from other ions that present in marine water. However, laboratory techniques for combatting matrix interference in metals analysis have become increasingly effective over time. Follow-up sampling and analysis for copper at Seep-2 was conducted twice in 2018 (wet and dry season). Results indicated copper concentrations were below the laboratory reporting limit of 0.0020 mg/L, which is below the PSL, during both sampling events. Based on the 2018 results, grit material in surface soil does not appear to be impacting groundwater quality.

Seep sample locations are shown on Figure 4; groundwater seep sample analytical results are presented in Table 9.

Marine surface water analytical results for samples collected 60 ft and 120 ft from the base of the rip rap at the Site indicate dissolved copper concentrations of 0.0012 mg/L (60 ft from rip rap) and 0.00096 mg/L (120 ft from rip rap). These concentrations indicate that copper concentrations are present in marine surface water near the Site, but not at concentrations above groundwater PSLs. Surface water analytical results are presented in Table 10.

6.3 SEDIMENT QUALITY

Marine sediment quality was evaluated to determine if the release of grit material onto the Beach Area and the Blair Waterway Area has negatively affected sediment quality.

6.3.1 SURFACE SEDIMENT QUALITY

During the RI, 32 surface sediment samples were collected throughout the Site, covering an area of approximately 60,000 sf (including both the Beach Area and the Blair Waterway Area). Surface samples were collected to assess the lateral extent of contamination potentially resulting from Tru-Grit activities; select locations were also analyzed for the full suite of SMS chemicals. Sediment was evaluated for grit content (percent), as well as submitted for chemical analysis of arsenic, copper, and zinc. Three additional surface sediment samples were collected outside the vicinity of the Site to evaluate the concentrations of metals in sediment likely unaffected by Tru-Grit activities. Samples BSG-1/BSC-1 and BSG-2 were collected crossgradient on the westside of the waterway and downgradient on the eastside of the waterway respectively. Sample G-B2 was collected upgradient of the Site along the eastside of the waterway (Figure 7). With the exception of the analytical results from sample location G-B2, the 2008 sediment

investigation results were not considered in the RI because newer adjacent sample results better reflect current sediment conditions. While the presence of grit was evaluated in the 2008 samples, the grit percentage was not estimated at the time of collection.

6.3.1.1 Evaluation of Grit in Surface Sediment

Grit material in sediment was identified based on degree of angularity (generally more angular than surrounding sediment), size (generally larger than surrounding sediment), vitreous (glassy) luster, and color (dark black). Some naturally occurring minerals exhibit some or many of these characteristics, making positive visual identification of grit material difficult in the field. However, samples were dried, sieved, and examined under a microscope to try and positively identify grit material. Selected microscope photographs of grit material are presented in Appendix E.

At 18 of the 32 surface sediment sample locations near the Property, grit material was visually identified. No grit material was identified in the three relative background sediment samples (BSG-1, BSG-2, and G-B2) collected outside the vicinity of the Site. The grit content of sieved sediment for 2014 samples was visually estimated and grouped into three categories: less than 5 percent grit material, between 5 and 15 percent grit material, and greater than 15 percent grit material. Samples collected in 2018 were classified by estimated grit percentage. Approximate visual grit content in surface sediment samples is presented in Table 11. Samples were sieved before identification of grit material; these ranges represent the percentage of grit in sand-sized grains at each location. The total percentage of grit in sediment (which generally consists of greater than 30 percent silt-sized grains) at each location would be lower than percentages estimated after sieving. The general distribution of grit material in surface sediment collected in 2014 is shown on Figure 5. All four 2018 samples contained grit material; percentages of grit in 2018 samples were either in the same category (SG-14 and SG-16, between 5 and 15 percent grit material and greater than 15 percent grit material, respectively), or in a lower category (SG-17 and G-5 2018 results were less than 5 percent grit material and between 5 and 15 percent grit material, respectively).

Grit material is concentrated west of the loading dock, within a topographic bench in the vicinity of surface sediment locations SG-16 and SG-17. The distribution of grit material trends parallel to the waterway from location SG-16, southeast to location SG-15. Grit material was not identified within the Beach Area adjacent to Outfall 4 or adjacent to the Tru-Grit maintenance building; however, some grit material was present in surface sediment beneath the loading dock west of the Orion Marine facility at locations SG-04 and SG-23. In general, grit content in surface sediment decreases with increasing proximity to the Upland Area. The lateral extent of grit material in surface sediment at the Site is well bounded except to the southeast of location SG-15.

6.3.1.2 Surface Sediment Chemical Quality

As noted in Section 3.0, the COPCs at the Site are the metals of concern in the grit material (copper and zinc), as well as arsenic, which was detected at the Site during previous investigations. Overall, chemical exceedances of one or more sediment PSL occurred at eight of the 32 Site surface sediment locations collected in 2014 and 2018. Of the Site and background samples where analyzed in 2014 and 2018, one sample exceeded the Site PSL for copper only, and five samples exceeded the Site PSL for zinc only, and two samples exceeded the Site PSL for copper and zinc. Arsenic concentrations also exceeded the PSL in five samples; two of these arsenic exceedances were paired with a zinc or copper and zinc exceedance. Other than locations G-B2 (arsenic and zinc), SG-04 (arsenic), and the 2018 SG-17 sample (arsenic), no exceedances of Site PSLs in surface sediment samples for arsenic, copper, or zinc were present at locations with less than 5 percent visual grit material. (The 2018 sample at SG-17 contained only 4 percent grit, but the same station tested in 2014 contained more than 15 percent grit).

Arsenic, which is not a constituent of grit material processed at the Tru-Grit facility, was detected at concentrations above the Site PSL at location SG-23, SG-04, SG-17 (2018 sample), and G-B2. Sample locations SG-04 and SG-23 were collected from beach locations underneath the dock of the Orion Marine facility, SG-17 is located farther out in the waterway and G-B2 is located southeast of the Orion Marine facility approximately 600 ft from the Tru-Grit loading operation.

No exceedances were identified at the relative background sample locations BSG-1 or BSG-2. However, exceedances of arsenic and zinc sediment PSLs (but no grit material) were identified at background sample location (G-B2), shown on Figure 7. Surface sediment sample analytical results for arsenic, copper, and zinc are shown on Figures 6 and 7, and are presented in Table 12.

Based on analysis of the grit material and previous studies (i.e., 2009 and 2014) conducted at the Site, the COPCs in marine sediment were limited to arsenic, copper, and zinc. To screen out any other potential COPCs at the Site, six surface sediment samples (2014 samples SG-10, SG-13; and 2018 samples collected at SG-14, SG-16, SG-17, and G-5, in conjunction with bioassay testing) were analyzed for the entire suite of SMS standard analytes for marine sediment (i.e., metals, PCBs, and SVOCs—WAC 173-204-562, Table III). No other constituents were present in these samples above the SCO and no other COPCs were identified. Results for sample locations where the full SMS analyses were conducted are presented in Table 13.

Based on the lateral distribution of grit material in surface sediment and the associated elevated copper and zinc concentrations, the source of surface sediment contamination at the Site appears to be limited to direct discharge of grit from barge offloading activities. Grit material and/or elevated metals concentrations do not correspond to patterns indicative of direct discharge of grit material to the waterway from material processing operations, or from the adjacent property storm drain system.

The 2018 samples were collected from locations that previously had the highest concentrations of copper and zinc; however, none of the 2018 surface sediment samples exceeded the PSL sediment criteria for copper or zinc. These results appear to indicate that natural recovery of the surface sediment is occurring with respect to the releases of grit material. However, the 2018 SG-17 surface sediment sample exceeded the PSL criteria for arsenic; whereas, the previous sample from this location did not exceed the PSL criteria for arsenic. This suggests a source of arsenic unrelated to Tru-Grit operations.

6.3.1.3 Bioassay Testing

Bioassay results from 2018 include pass/fail designations of the SCO and CSL criteria for each sample and each of the three biological tests: amphipod mortality, juvenile polychaete growth, and larval development. The results, summarized in Table 14 and presented in detail in Appendix C and on Figure 6, indicate all samples pass the SCO and CSL criteria for all tests, except for samples SG-16 and SG-17, which failed the SCO criteria only for the larval development but passed the CSL criteria.[2] Failure of the SCO but not the CSL criteria indicates minor potential for adverse effect on the benthic community. Although the SG-16 and SG-17 samples failed the SCO criteria, chemical analysis conducted on both samples at the same time as the bioassay, indicated that copper and zinc concentrations did not exceed SCO or CSL criteria, additionally copper and zinc concentrations at SG-16 and SG-17 were lower than at G-5, which passed both the SCO and CSL. However, the arsenic concentration in SG-17 did exceed the sediment PSL; at SG-16 there were no exceedances of the sediment PSLs. The chemical results indicate that the bioassay failure likely is not a result of the elevated copper and zinc; it may be related to elevated arsenic at SG-17, which is unrelated to releases from the Tru-Grit operation.

6.3.2 SUBSURFACE SEDIMENT QUALITY

During the RI, 13 subsurface sediment cores were collected. One of the cores (BSC-1) was collected across the Blair Waterway and outside the vicinity of the Site to evaluate the concentration of metals in sediment likely unaffected by Tru-Grit activities (Figure 7). One sediment core (SC-14A) was advanced to refusal and a sample was collected from the material retained in the core nose. Sediment samples were evaluated for grit content (percentage) and submitted for chemical analysis of arsenic, copper, and zinc. Core locations are shown on Figures 3 and 7.

Two samples each were collected from the 12 initial cores and one sample was collected from the core nose at location SC-14A, resulting in 25 samples submitted for analysis. When grit was readily apparent at the sample location, one sample was collected from the area with the highest percentage of grit,

[2] Larval development sample bioassay procedures included the resuspension test.

while the second sample was collected below that interval. When grit material was not readily apparent, one sample was collected between the 1- and 2-ft interval, and a second sample was collected directly below that interval.

The visual presence of minor amounts of grit material in cores was difficult to ascertain during core processing activities. Remaining sediment sample volumes were dried and sieved by the laboratory and observed with a microscope after core processing activities to confirm the initial assessment of grit material. Grit content of sieved subsurface sediment was visually estimated and grouped into three categories: less than 5 percent grit material, between 5 and 15 percent grit material, and more than 15 percent grit material. As noted in Section 6.2.1, samples were sieved before identification of grit material; these ranges represent the percentage of grit in sand-sized grains at each location. The total percentage of grit in sediment (which generally consists of greater than 30 percent silt-sized grains) at each location would be lower than percentages estimated in sieved samples. The general vertical distribution of grit material in subsurface sediment is shown on Figure 8. Approximate visual grit content (percent) in subsurface sediment is presented in Table 11.

Visual grit material in subsurface sediment is concentrated within the upper 5 ft of sediment around the end of the ship-to-shore conveyance system. The presence of grit material in subsurface sediment was vertically bounded during core advancement at all sample locations where grit was present. High percentages of grit material were observed from 1–5 ft below the sediment surface at location SC-13 (no grit was observed in the 0–1 ft interval). Grit content at SC-13 increased with depth to 5 ft below the sediment surface; beneath approximately 5 ft, grit material was not identified. At two locations (i.e., SC-17 and G-5) a high percentage of grit material was observed as deep as 3 ft, with the percentage of grit material gradually decreasing with depth (no visible grit beneath 4 ft at SC-17 and beneath 5 ft at G-5). No grit material was observed at the background core location, BSC-1 (sample location presented on Figure 7).

Exceedances of Site sediment PSLs were detected in 11 samples at seven of the core locations (i.e., G-5, SC-12, SC-13, SC-14, SC-14A, SC-16, and SC-17). These locations are all within the vicinity or just west of the ship-to-shore conveyance system (Figure 9). Correlation between the presence of grit material and elevated metal concentrations is discussed in the section that follows.

6.3.2.1 Grit Material Distribution and Metal Exceedances

Unlike the surface sediment samples (Section 6.2.1), grit material in proportions of less than 5 percent did not necessarily correlate with lower metals concentrations in subsurface sediment. Metals exceedances of Site sediment PSLs for the sediment COPCs occurred in six subsurface samples with grit proportions of less than 5 percent (SC-12 [1–2 ft], SC-14 [2–3 ft], SC-16 [1–2 ft and 2–3 ft], SC-17 [3–4 ft], and G-5 [4–5 ft]).

Arsenic

Arsenic concentrations in subsurface sediment exceeded Site PSLs in 10 samples, collected at seven of the core locations. The highest arsenic concentrations were detected at locations SC-13 (1,500 mg/kg at 3–4 ft) and at SC-17 (1,100 mg/kg at 2–3 ft), both northwest of the ship-to-shore conveyance system. Arsenic exceedances were identified in five samples with less than 5 percent grit material (SC-12 [1–2 ft], SC-14 [2–3 ft], SC-16 [1–2 ft and 2–3 ft], and SC-17 [3-4 ft]). Arsenic exceedances were also identified in three samples with more than 15 percent grit material (G-5 [2–3 ft], SC-13 [3–4 ft], SC-14A [3–3.1 ft], and SC-17 [2–3 ft]). In nine of the 10 samples, arsenic exceedances were correlated with exceedances of copper and/or zinc; the remaining sample (SC-16, 2–3 ft) only exceeded the Site sediment arsenic PSL. Arsenic in sediment is not related to Tru-Grit operations.

Copper and Zinc

Copper and/or zinc concentrations exceeded the Site sediment PSLs in 10 samples, collected at seven core locations. In eight of these samples, both copper and zinc exceeded the Site sediment PSLs, while at the remaining two locations only zinc exceeded Site PSLs. The highest copper and zinc concentrations were detected between 2–3 ft at locations G-5 (2,600 and 8,900 mg/kg, respectively) and at SC-17 (2,000 and 3,000 mg/kg, respectively).

Copper and/or zinc exceedances were identified in five samples with less than 5 percent grit material (SC-12 [1–2 ft], SC-14 [2–3 ft], SC-16 [1–2 ft], SC-17 [3–4 ft], and G-5 [4–5 ft]). Copper and zinc exceedances were identified in three samples with more than 15 percent grit material (SC-13 [3–4 ft], SC-17 [2–3 ft], and G-5 [2–3 ft]). In all but two samples, copper and zinc exceedances occurred together. At sample locations SC-12 (1–2 ft) and SC-16 (1–2 ft), zinc and arsenic exceeded Site PSLs, while copper did not.

6.3.2.2 Vertical Extent of Contamination

While the presence of grit material in subsurface sediment is bounded vertically, the vertical extent of metals contamination is not. Arsenic exceedances in subsurface sediment are vertically bounded only at locations SC-12 (at 2 ft below the sediment surface) and SC-13 (at 5 ft below the sediment surface). At the remaining five core locations where arsenic exceedances were present (locations SC-14, SC-14A, SC-16, SC-17, and G-5) arsenic concentrations are not vertically bounded, with exceedances detected as deep as 5 ft at location G-5.

Copper and zinc exceedances are vertically bounded at three core locations SC-12 (below 2 ft), SC-13 (below 5 ft), and at SC-16 (below 2 ft). At the remaining four subsurface locations where copper

and zinc exceedances were present (locations SC-14, SC-14A, SC-17, and G-5) they are not vertically bounded, with exceedances detected as deep as 5 ft at location G-5. However, sediment deposition over the Tru-Grit operation period is expected to be only about 2.4 ft (see Section 4.1.5), indicating that deeper metals exceedances are not likely related to Tru-Grit operations but are more likely the result of previous activity on the site related to the shipyard operations.

6.3.2.3 Additional Grit-like Material

The initial assumption of the RI was that all grit material at the Site was the result of Tru-Grit activities; however, a layer of consolidated clay and grit material, which exhibits different physical and chemical properties than the grit material in surface sediment, was encountered in the vicinity of core SC-14 (Section 3.4.2). The consolidated material contained both paint chips and small plastic or polymer beads in addition to grit material (see Appendix E for photographs of the grit material). Tru-Grit has never engaged in painting at the Site, nor has it processed or handled bead-like materials. It is possible that this distinctive grit material has been deposited from historical sandblasting, painting, or other activities at or in the vicinity of the Facility.

Sediment containing this distinctive type of grit material (location SC-14A) was analyzed for arsenic, copper, and zinc and had concentrations of 670 mg/kg, 1,400 mg/kg, and 1,800 mg/kg, respectively. Concentrations of all three metals exceed the Site sediment PSLs. These data indicate the Site sediment quality was impacted by previous operations prior to Tru-Grit's arrival.

7.0 CONCEPTUAL SITE MODEL

The CSM was refined from the preliminary CSM presented in the Work Plan and was developed based on current and future land use, affected media at the Site, and the potential receptors and exposure pathways evaluated during the investigation process. A schematic of the refined CSM presented below is provided on Figure 10.

7.1 CURRENT AND FUTURE LAND USE

Tru-Grit does not intend to continue operations at the Facility. Prior to departure, paved areas will be swept, the storm drain system will be cleaned and emptied, and the vegetated strip between the Facility and the shoreline will be scraped clear of any remaining grit material. The Port was contacted regarding potential future uses of the site after the departure of Tru-Grit (Hooton 2012). Its response indicated that the Port intends future land use to be consistent with the PMI zoning of the property, which may include ship berthing. Additionally, the Port does not currently have plans for maintenance dredging in the Blair Waterway near the site (Hooton 2012); however, potential deepening of the Blair Waterway may be conducted in the future. Though this dredging would not occur within the Tru-Grit Site, sloughing of sediments adjacent to the dredging is possible and could result in an approximately 2:1 slope form the edge of the dredging line. Based on an assumed dredging depth of –57 ft MLLW, the assumed slough line could intersect with the Site. Further discussion of impacts of this potential dredging will be presented in the FS.

7.2 CONTAMINANTS OF POTENTIAL CONCERN AND AFFECTED MEDIA

Potentially affected media identified in the RI Work Plan include marine sediment, upland surface soil, and groundwater. However, findings from the RI investigation have eliminated upland soil and groundwater as affected media. Marine sediment is the only remaining confirmed affected media. Based on elevated chemistry concentrations and larval CSO failures of the SCO level, the COPCs for marine sediment are arsenic, copper, and zinc. Arsenic is not present in grit material processed at the Tru-Grit facility and the source of arsenic contamination is currently unknown.

7.3 DISCHARGE SOURCE AREAS

As noted in Section 3.1, the RI was designed to evaluate the nature and extent of contamination at the Site, which included screening potential source discharge areas that may have contributed to Site contamination. The Work Plan identified six potential source discharge areas including the barge offloading area, the material storage areas, rooftops, the stormwater infiltration pond, the material processing operations, and the adjacent property's storm drain system (LAI 2013). Groundwater and

surface soil at the Site were demonstrated to meet PCLs. Therefore, the three potential upland sources (i.e., the material storage area, the rooftops, and the stormwater infiltration pond) identified in the Work Plan are eliminated based on the current data. Two potential discharge sources to sediment and surface water (i.e., the material processing operations and the adjacent property's storm drain system) identified in the Work Plan were eliminated based on current near-shore sediment and marine water data. No COPC exceedances were identified within the vicinity of these potential sources.

During barge offloading operations, grit material was unintentionally discharged to sediment from the barge or from the ship-to-shore conveyor system. This is the primary discharge source to surface sediment.

Arsenic contamination identified in isolated areas of surface sediment (sampling location SG-23) underneath the Orion Marine dock are not attributed to releases from Tru-Grit's operations. Subsurface sediment contamination associated with arsenic exceedances or material otherwise distinct from the grit material historically managed by the Facility also are not attributed to releases from Tru-Grit's operation (Section 6.3.2.3). The source or sources of arsenic and other foreign materials in the subsurface are unidentified but are outside the scope of this investigation.

7.4 POTENTIAL EXPOSURE PATHWAYS

The Work Plan identified three potential exposure pathways including direct contact with soil, groundwater discharge to surface water, and uptake of contaminants in sediment by benthic organisms (LAI 2013). The results of the RI indicate that contaminated groundwater is not discharging to surface water and surface soil concentrations are below PCLs for direct contact. Therefore, groundwater-to-surface water discharge and direct contact with soil are not exposure pathways of concern at the Site.

The remaining potential exposure pathway that may be present at the Site is uptake of contaminants in sediment by benthic organisms. Exposure of benthic organisms to contaminants released to the biologically active zone of sediment (the upper 10 cm below the mudline) may result in the uptake of contaminants in these organisms. Bioassay data indicated that copper and zinc concentrations in surface sediment do not appear to be adversely impacting benthic organisms. Although two bioassay locations failed the SCO criteria, copper and zinc concentrations at those locations did not exceed the SCO sediment chemical criteria. The reason for the bioassay failure of the SCO criteria at these locations is unknown.

7.5 POTENTIAL RECEPTORS

The Work Plan identified receptors at the Site including humans (Site workers, construction workers, and visitors), benthic organisms, and aquatic organisms (LAI 2013). The results of the RI indicate that ingestion or dermal contact with soil does not present a threat to humans (i.e., Site workers, construction

workers, and/or visitors). Additionally, groundwater data and marine water sample data indicate that copper and zinc concentrations in the grit material are not adversely impacting marine water quality and aquatic organisms are not a potential receptor. Benthic communities present in the upper 10 cm of sediment within the Blair Waterway adjacent to the Site are still potential receptors.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The objective of the RI was to collect and evaluate sufficient information regarding contamination at the Site potentially resulting from activities at the Tru-Grit Facility to enable the selection of a cleanup action, as necessary. The following sections present the conclusions of the RI.

8.1 CONCLUSIONS

Based on the results of the RI, contaminant-affected media at the Site related to historical Tru-Grit activities appears to be limited to copper and zinc in near-surface sediment. However, it is not clear that copper and zinc in surface sediment have a negative effect on the benthic community because it does not appear that copper and zinc were the cause of the bioassay larval SCO failure, and all other bioassay tests passed at those locations and all other locations. Copper and zinc are also present in soil, but groundwater (seep) sampling indicates that soil concentrations of copper and zinc are not impacting groundwater.

8.1.1 UPLANDS SOIL AND GROUNDWATER

Grit material released during the course of Tru-Grit operations has resulted in detectable quantities of copper and zinc in soil within the Uplands portion of the Site. However, copper and zinc concentrations in soil are not considered hazardous to human health through direct contact based on MTCA Method B criteria for unrestricted land uses (Section 6.1). Potential impacts to groundwater have also been evaluated. Copper and zinc concentrations in groundwater indicate that these constituents in soil are not impacting groundwater quality and copper and zinc are no longer considered COPCs for soil or groundwater in the Uplands portion of the Site.

8.1.2 SURFACE SEDIMENT

Grit material released during the course of Tru-Grit operations appears to have resulted in copper and zinc concentrations exceeding PSLs in surface sediment at the Site, located in the vicinity of the ship-to-shore offloading conveyance system and west of the offloading area (Figure 5).

In general, grit content in surface sediment decreases with increasing proximity to the Upland Area. The lateral extent of copper contamination in surface sediment appears to be restricted to two small areas near the offloading system, and at one location adjacent to where the barge would dock during unloading (Figure 6). The lateral extent of zinc contamination overlaps the area of copper contamination. The lateral extent of zinc above PSL in surface sediment is well delineated to the north, east and west; this lateral extent does not extend into the Blair Waterway navigation channel. However, the lateral extent is not laterally bounded to the south, where sample SG-15 contained zinc above the PSL, and sample GB2 (approximately

375 ft to the south of SG-15) also contained elevated concentrations of zinc. However, GB-2 contained arsenic, in addition to the elevated zinc, indicating that the zinc contamination to the south of the Site is the result of a comingled contaminant source. Elevated arsenic concentrations are observed to the south (G-B2), west (2018 SG-17 sample), and near the shoreline (SG-04 and SG-23). The presence of comingled contaminant sources prevents delineation of a distinct Site boundary to the south; however, this fact will not prevent the FS from adequately evaluating remedial options that address Tru-Grit impacts to sediment at the Site.

Based on the lateral distribution of grit material in surface sediment and the associated copper and zinc concentrations, the source of grit material in surface sediment at the Site appears to be limited to direct discharge of grit from barge offloading activities. Grit material and/or elevated metals concentrations do not correspond to patterns indicative of direct discharge of grit material to the waterway from material processing operations, or from the adjacent property storm drain system. Bioassay analysis in 2018 from the most impacted areas of the Site indicates that these concentrations of copper and zinc in the grit material managed by the Facility resulted in compliance with the CSLs at all four analyzed samples, and only slightly exceeded the SCO criteria for one of three bioassay tests (larval development) at SG-16 and SG-17. However, it is not apparent that copper and zinc are the cause of the SCO failure at SG-16 and SG-17, because copper and zinc concentrations in the sediment samples collected for the bioassay were below the PSLs, copper and zinc concentrations were lower than in other samples that passed the bioassay SCO benchmarks for the larval test, and both samples had arsenic concentrations background concentrations, with one sample exceeding the PSL for arsenic.

The Sediment Cleanup User's Manual II (SCUM II, Ecology 2017) identifies procedures for using bioassay data to identify cleanup sites and station clusters of potential concern. For a station cluster to be of potential concern, it must exceed the CSL biological criteria in at least three stations, otherwise the station cluster is considered to have low or no concern for benthic toxicity; in which case, it does not require further evaluation. Note that none of the bioassay samples from the site exceeded the CSL criteria for any test and are considered to be of low or no concern for benthic toxicity according to the SCUM II.

The chemical analysis results from the 2018 sampling event showed overall lower concentrations of zinc and copper in surface sediment than in previous sampling events and none of the 2018 surface sediment samples exceeded the PSL sediment criteria for copper and zinc. This supports the conclusion that natural recovery of sediment is occurring with respect to the release of grit material.

8.1.3 SUBSURFACE SEDIMENT

Some subsurface sediment contamination, as well as limited surface sediment contamination, associated with arsenic exceedances, does not appear to be related to Tru-Grit operations. Arsenic is not

present in grit material processed at the Tru-Grit facility; therefore, it can be used to differentiate between contamination potentially associated with Tru-Grit operations and contamination resulting from activities by other parties. The source of the arsenic contamination is currently unknown. If arsenic is present, a comingled source is present, at a minimum.

The presence of grit material in subsurface sediment was vertically bounded during core advancement at all sample locations where grit was present. Unlike the surface sediment samples (Section 6.2.1), grit material in proportions of less than 5 percent did not necessarily correlate with below-PSL metals concentrations in subsurface sediment.

The vertical extent of subsurface sediment contamination contributed by Tru-Grit operations appears to be limited to the upper 1–2 ft of sediment, based on deeper sediment samples that have exceedances of arsenic, uncharacteristic of the materials managed by Tru-Grit. Arsenic is also present at the 1–2-ft depth in some samples; the presence of arsenic in these intervals suggests comingled contaminant sources may be present. This is consistent with the expected maximum amount of deposition (2.4 ft) over the time period that Tru-Grit operated at the Site (Section 4.1.5). The layer of grit material present, approximately 3 ft beneath the mudline at SC-14A, with distinctive physical characteristics (paint chips and plastic bead material) and chemical characteristics (elevated arsenic), is uncharacteristic of the Tru-Grit material, and provides additional evidence that other historical sources (e.g., sandblasting, painting, etc.) impacted sediment at the Site prior to Tru-Grit's arrival.

8.2 RECOMMENDATIONS

Based on the data presented above, cleanup of Upland soil and groundwater are not required. Although copper and zinc concentrations in surface sediment do not appear to be adversely impacting the benthic community and surface sediment appears to be recovering naturally, Ecology has requested that an FS be conducted, and this FS will evaluate a range of remedial alternatives. Tru-Grit submitted an Agency-Review Draft FS dated December 2, 2019 to Ecology for review.

9.0 USE OF THIS REPORT

This RI report has been prepared for the exclusive use of CanAm and applicable regulatory agencies for specific application to the Tru-Grit Site located in Tacoma, Washington. None of the information, conclusions, and recommendations included in this document can be used for any other project without the express written consent of LAI. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by LAI, shall be at the user's sole risk. LAI warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

10.0 REFERENCES

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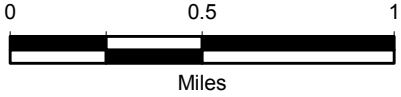
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Data Source: Esri 2012

G:\Projects\241\0080\10\0014\RIFS 2014 R2\F01VicMap.mxd 9/26/2014 NAD 1983 StatePlane Washington North FIPS 4601 Feet

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Tru-Grit Site Tacoma, Washington	**Vicinity Map**	Figure 1



Legend

Parcel Boundary Line

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Source: Google Earth Pro 2010

0 300 600

Scale in Feet

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Tru-Grit Site
Tacoma, Washington

Facility and Adjacent Properties

Figure
2

Legend

- Upland Surface Soil Sample Location
- Beach Area Sediment Sample Location
- Subtidal Surface Sediment Sample Location
- Subtidal Surface and Subsurface Sediment Sample Location
- Subtidal Subsurface Sediment Sample Location
- 2008 Sediment Sample Location
- Seep Sample Location
- Marine Surface Water Sample Location
- Parcel Boundary

KEY
F - Movable Building
G - Dryer Feed Hopper
H - Dry Drum Assembly
I - Screens
J - Baghouse
K - Bucket Elevator
L - Sand Storage
M - Bucket Elevator
N - Load-out Bin
P - Bucket Elevator

Ecology Block Wall
Load Out Area
CB5
CB3
CB4
CB2
New Storm Sewer
Covered Stockpile Area
Process Area
Approximate Location of Overflow Grit Stockpile Area (Used 2005-2007)
U-6
U-5
U-4
U-3
U-2
U-1
275 Gallon Diesel Tank
Additional Storage
Tent Shed with Forklift
Equipment Maintenance
Roof Drains
TOTE
Current Stormwater Treatment Facility and Former Stormwater Infiltration Pond
Historical and Current Stormwater Overflow Swale
SEEP-1
SEEP-2
SG-24
SG-3
SG-2
Rip Rap
Vegetated Area
OUTFALL 4
SG-1
SG-05/SC-05
SG-06
SG-07/SC-07
SG-4
SG-23
Hopper
Dock
Marine-60
Approximate Ordinary High Water Line
G-B1
SG-09/SG-09
SG-10/SC-10
G-2
G-3
G-4
G-1/C-1
SG-25
SG-08/SC-08
Marine-120
Fender Piles
G-5
G-5 (CORE)
SG-26
SG-11
SG-12/SC-12
SG-13/SC-13
SC-14C
SC-14A
SG-14/SC-14
SC-14B
SG-15
G-B2
SG-27
SG-16/SC-16
SG-17/SC-17
SG-18
SG-19
Approximate Barge Location when Unloading (barge is approximately 75 ft x 280 ft)
SG-28
SG-20
SG-21
SG-22

-2 -6 -14 -22 -26 -30 -32 -40 -42 -48 -50 -10 -8 -20 -28 -46

0 60 120
Scale in Feet

Source: Google Earth Pro 2010; Aerial dated 04-30-2009

Notes

1. Samples G-5, SG-14, SG-16, and SG-17 were collected in 2008/2009 and 2018. 2018 samples were collected within 10-ft of the 2008/2009 sample locations.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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Tru-Grit Site Tacoma, Washington	**Site Plan and Sample Locations**	Figure 3

Landau Associates | G:\Projects\241\008\020\023\F03SitePlan.dwg | 11/29/2018 12:00 PM

Ecology Block Wall

Approximate Location of Overflow Grit Stockpile Area (Used 2005-2007)

U-6 (86,170)

Covered Stockpile Area

U-5 (120,230)

U-4 (34,76)

Equipment Maintenance Roof Drains

TOTE

U-1 (110,310)

U-2 (63,130)

U-3 (79,180)

Current Stormwater Treatment Facility and Former Stormwater Infiltration Pond

Historical and Current Stormwater Overflow Swale

SEEP-1 (0.0012,ND)

SEEP-2
4/15/13 (0.0095, 0.0049)
5/17/18 (<0.0020, NA)
9/07/18 (<0.0020, NA)

Vegetated Area

Approximate Ordinary High Water Line

Dock

Approximate Barge Location when Unloading (barge is approximately 75 ft x 280 ft)

-2 -4 -10 -16 -20 -28 -40 -50 -6 -14 -22 -26 -8 -14 -22 -28 -32 -40 -46 -30 -32 -42 -48 -10 -20 -30 -40 -50

Legend

U-6 (86,170) Sample Designation (Copper, Zinc)

Upland Surface Soil Sample Location

Beach Area Sediment Sample Location

Seep Sample Location

Parcel Boundary

Preliminary Screening Levels

Copper	Zinc	
36	101	Soil Preliminary Screening Level - (mg/kg)
0.0024	0.081	Groundwater Preliminary Screening Level - (mg/L)

NA = Not Analyzed
ND = Non Detect

Notes:

1. Zinc concentrations are not indicative of impacts to the groundwater. Therefore the preliminary screening level for zinc has been revised to 24,000 mg/kg (Text: Section 6.1)
2. All samples were collected on 4/15/13 unless otherwise specified.
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 60 120
Scale in Feet

Source: Google Earth Pro 2010; Aerial dated 04-30-2009

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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Tru-Grit Site
Tacoma, Washington

Upland Analytical Results

Figure 4

Landau Associates | G:\Projects\241\008\020\023\F04UplandAnalyticalResults.dwg | 12/7/2018 11:28 AM



Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 60 120
Scale in Feet

Source: Google Earth Pro 2010; Aerial dated 04-30-2009

Tru-Grit Site Tacoma, Washington	**Surface Sediment Approximate Grit Content**	Figure 5

LANDAU ASSOCIATES

Landau Associates | G:\Projects\241\008\020\023\Revised RI\F05Surface Approximate Grit Content.dwg | 2/12/2020 11:23 AM | EZICK

N

SG-02 (2,12,48)
SG-24 (1.5,11,24)
SG-03 (7.3,12,36)
Outfall 4
SG-01 (6.7,52,85)
SG-06 (2.4,20,32)
SG-23 (140,420,1200)
SG-05 (6.2,36,120)
SG-07 (21,76,130)
SG-04 (66,160,380)
SG-08 (4.5,24,42)
SG-09 (17,58,110)
*SG-10 (7.8,35,78)
SG-25 (7.3,36J,51)
G-5 (8.9,1390,3400)
*G-5 (11,120,390)
G-B2 (185,231,665)
SG-26 (4.0,23,32)
SG-11 (16,45,84)
SG-12 (38,180,450)
*SG-13 (13,58,170)
SG-14 (6.6,200,650)
*SG-14 (8.5,43,77)
SG-15 (38,250,630)
SG-16 (11,360,1200)
*SG-16 (14,75,150)
SG-17 (31,550,1700)
*SG-17 (81,97,240)
SG-27 (8.1,28,42)
SG-18 (45,100,170)
SG-19 (7.4,46,74)
SG-28 (5.36,36,49)
SG-20 (5.6,34,79)
SG-21 (6.4,33,56)
SG-22 (8.2,34,52)

-2 -4 -6 -8 -10 -12 -14 -16 -18 -20 -22 -24 -26 -28 -30 -32 -36 -38 -40 -42 -46 -48 -50

Notes

1. Samples G-5, SG-14, SG-16, and SG-17 were collected in 2008/2009 and 2018. 2018 samples were collected within 10-ft of the 2008/2009 sample locations.
2. *Full SMS list analyzed at these locations.
3. Preliminary screening level, equivalent to SMS sediment cleanup objective (SCO) protective of the benthic community.
4. PG = Polychaete Growth
   AM = Amphipod Mortality
   LD = Larval Development
5. All results shown in mg/kg.
6. Red text indicates concentrations is greater tthan the preliminary screening level.
7. G-B2 sample was collected in 2008.
8. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Legend

- Beach Area Sediment Sample Location
- Subtidal Surface Sediment Sample Location with Bioassay Analysis
- Outfall
- Sediment Sampling Location
- Subtidal Subsurface Sediment Sample Location
- Subtidal Surface Sediment Sample Location
- Tax Parcels

G-5 (8.9,1390,3400) 2014 Analytical Data (Arsenic,Copper,Zinc)

G-5 (11,120,390) 2018 Analytical Data (Arsenic,Copper,Zinc)

AM / PG / LD

- Pass SCO and CSL
- SCO Fail

Preliminary Screening Levels

Arsenic	Copper	Zinc
57	390	410

0 60 120

Scale in Feet

Data Sources: Pierce County GIS; Esri World Imagery.

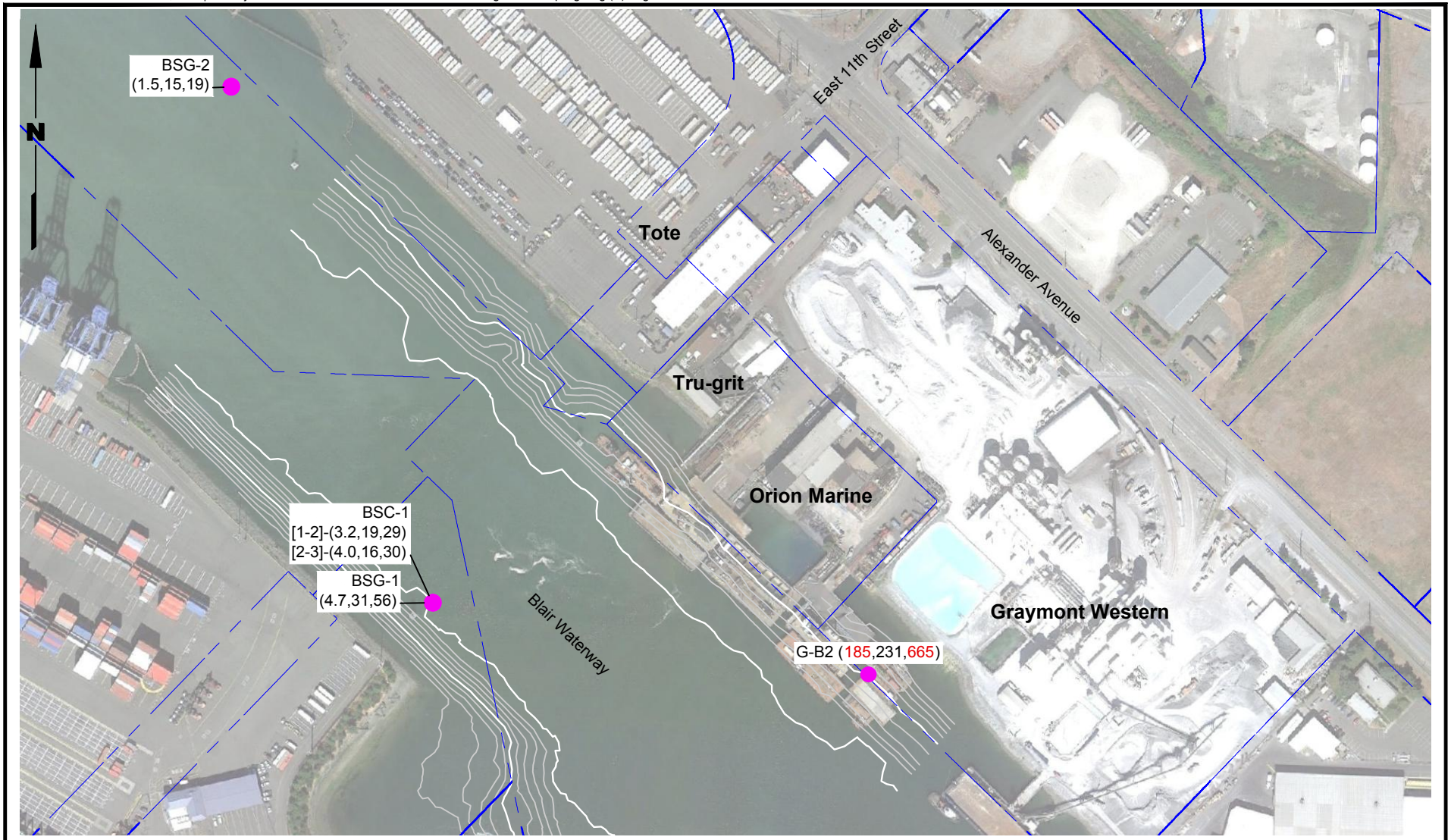
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Tru-Grit Site
Tacoma, Washington

Surface Sediment Analytical and Bioassay Results

Figure 6



Legend

BSG-1 ● Background Sample Location

Parcel Boundary Line

Preliminary Screening Levels

Arsenic	Copper	Zinc	
57	390	410	(mg/kg)

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Source: Google Earth Pro 2010

0 300 600

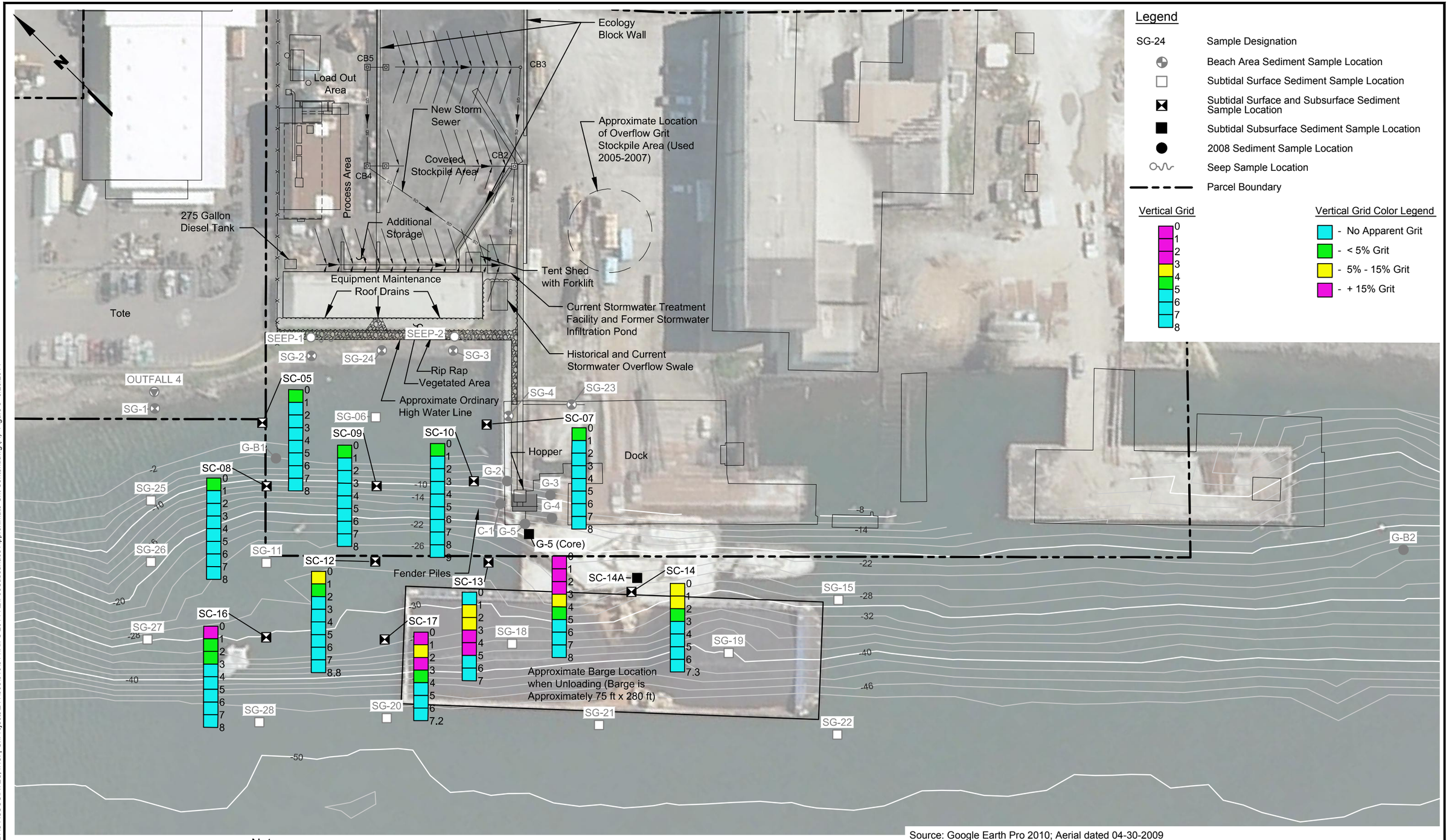
Scale in Feet

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Tru-Grit Site
Tacoma, Washington

Background Surface and Subsurface Sample Locations

Figure 7



LANDAU ASSOCIATES, INC. | G:\Projects\241\008\010\014\RIFS 2014 R2\F08Subsurface Approximate Grit Content.dwg (A) "Figure 8" 9/29/2014

Source: Google Earth Pro 2010; Aerial dated 04-30-2009

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Grit content in 0-1 ft interval taken from co-located surface sediment samples.

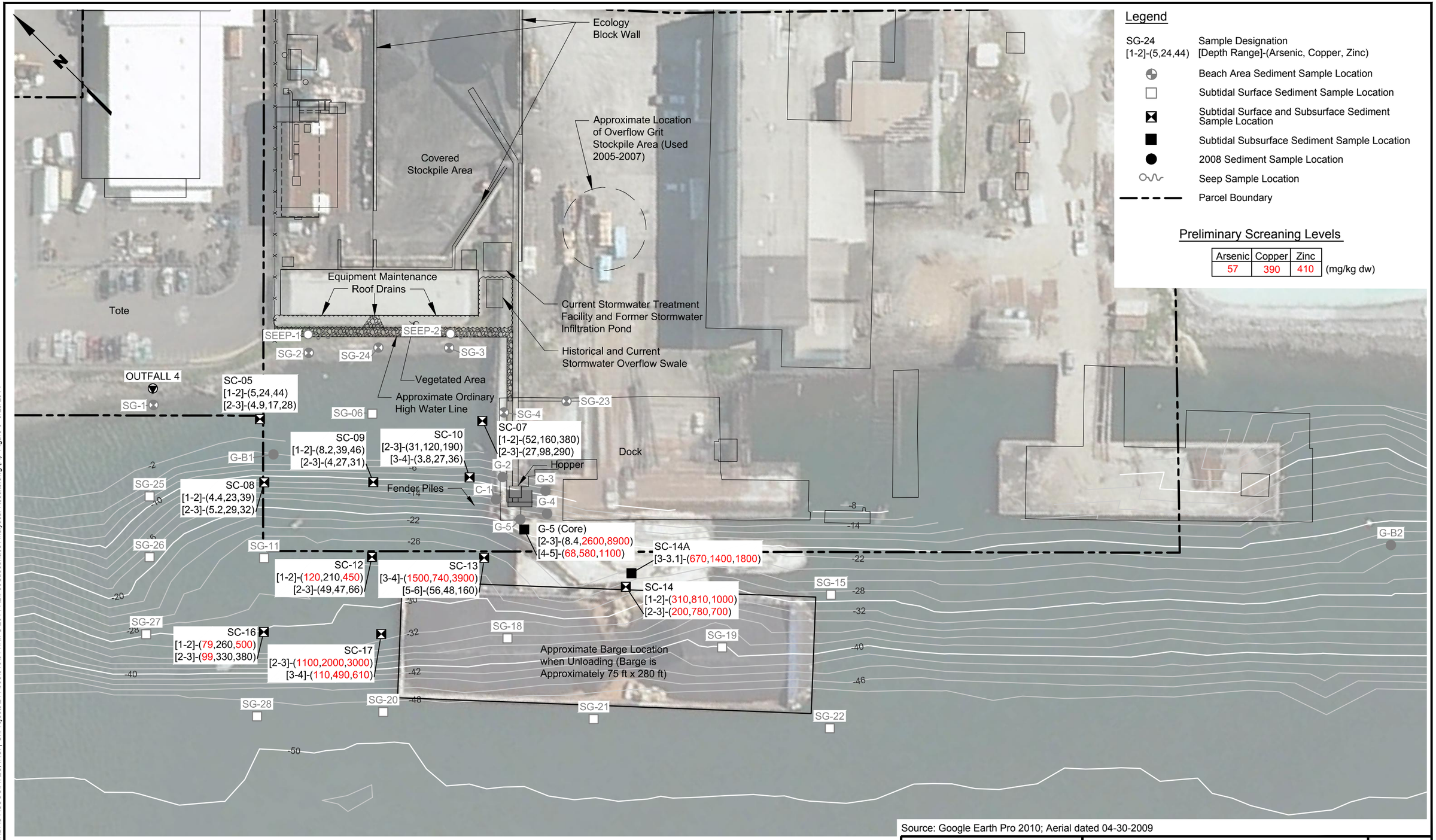
0 60 120
Scale in Feet

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Tru-Grit Site
Tacoma, Washington

Subsurface Sediment Approximate Grit Content

Figure 8



Legend

SG-24 [1-2]-(5,24,44)	Sample Designation [Depth Range]-(Arsenic, Copper, Zinc)
	Beach Area Sediment Sample Location
	Subtidal Surface Sediment Sample Location
	Subtidal Surface and Subsurface Sediment Sample Location
	Subtidal Subsurface Sediment Sample Location
	2008 Sediment Sample Location
	Seep Sample Location
	Parcel Boundary

Preliminary Screaning Levels

Arsenic	Copper	Zinc	
57	390	410	(mg/kg dw)

Source: Google Earth Pro 2010; Aerial dated 04-30-2009

Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Preliminary screening level, equivalent to SMS sediment cleanup objective (SCO) protective of the benthic community.

0 60 120
Scale in Feet

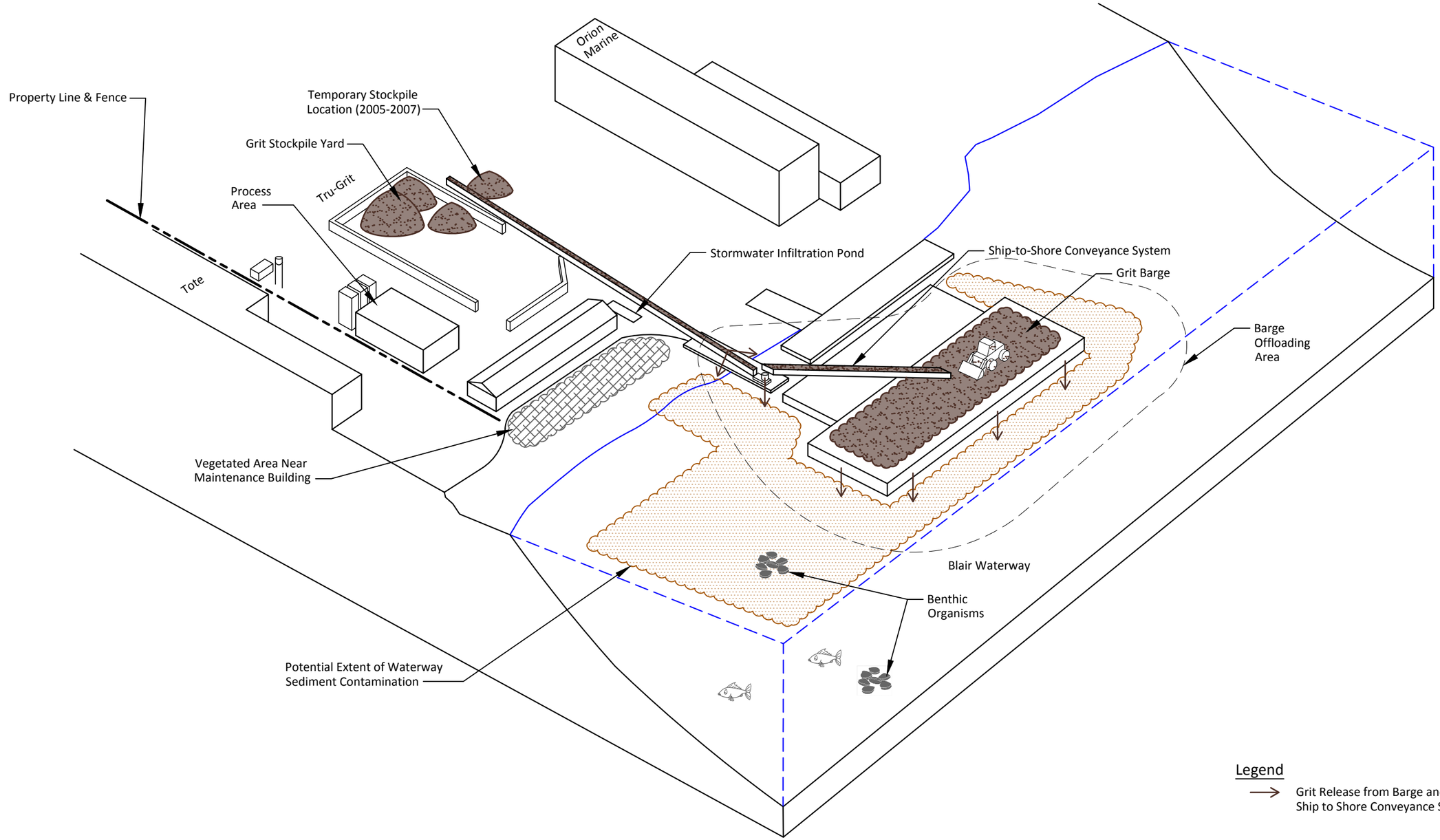
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Tru-Grit Site
Tacoma, Washington

Subsurface Sediment Analytical Results

Figure 9

LANDAU ASSOCIATES, INC. | G:\Projects\241\008\010\014\RIFS 2014 R2\F09Subsurface Analytical Results.dwg (A) "Figure 9" 9/29/2014



Not to Scale

Legend

→ Grit Release from Barge and Ship to Shore Conveyance System

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Tru-Grit Facility Tacoma, Washington	**Conceptual Site Model**	Figure 10

LANDAU ASSOCIATES

LANDAU ASSOCIATES, INC. | G:\Projects\2441\008\020\023\F10 ConceptualSiteModel.dwg (A) "Figure 10" 7/5/2019

Table 1
Total Metals Content in Grit Material
Tru-Grit Site
Tacoma, Washington

Analyte	British Columbia Research Anyox slag (Tru-Grit Raw Material) Report Date 7/1991		Sound Analytical		OCL Materials LTD	Spectra
	Sample No.		11/4/1991 Tru-Grit	11/4/1991 Black	4/1992 Tru-Grit	8/25/2016 Tru-Grit
	1	4	Material	Lustre (a)	Material	Material
Metals (mg/kg)						
Aluminum	28,900	23,800	NA	NA	NA	NA
Antimony	NA	NA	<1.0	<1.0	NA	NA
Arsenic	<5	<5	<0.90	<0.90	<10	1.2
Barium	NA	NA	100	100	929	NA
Beryllium	440	430	<0.090	<0.90	NA	NA
Cadmium	<2.5	<2.5	<0.18	<0.18	<0.1	0.8
Chromium	94.8	74.4	27	27	29.5	NA
Chromium (+6)	NA	NA	0.085	0.085	NA	NA
Chromium (+3)	NA	NA	27	27	NA	NA
Cobalt	NA	NA	60	60	180	NA
Copper	2,590	2,330	1,000	1,000	2,280	13
Iron	329,000	337,000	NA	NA	NA	NA
Lead	84.7	84.3	35	35	21	16.9
Mercury	<0.1	<0.1	<0.1	<0.1	<0.03	<0.05
Molybdenum	NA	NA	27	27	7.7	NA
Nickel	NA	NA	1.5	1.5	4.3	1.5
Selenium	4	2.9	<0.45	<0.45	<1	NA
Silver	<5	<5	1.4	1.4	NA	1.9
Thallium	NA	NA	<0.72	<0.72	NA	NA
Vanadium	NA	NA	37	37	NA	NA
Zinc	8,380	8,930	3,900	3,900	8,270	1,270
Sodium	NA	NA	2,200	2,200	NA	NA
SPLP Metals (mg/L)						
Copper	NA	NA	NA	NA	NA	NA

Table 1
Total Metals Content in Grit Material
Tru-Grit Site
Tacoma, Washington

Analyte	TestAmerica		
	1/25/2018 Pile 1 Tru-Grit Material	1/25/2018 Pile 2 Tru-Grit Material	1/25/2018 Pile 3 Tru-Grit Material
Metals (mg/kg)			
Aluminum	NA	NA	NA
Antimony	NA	NA	NA
Arsenic	NA	NA	NA
Barium	NA	NA	NA
Beryllium	NA	NA	NA
Cadmium	NA	NA	NA
Chromium	NA	NA	NA
Chromium (+6)	NA	NA	NA
Chromium (+3)	NA	NA	NA
Cobalt	NA	NA	NA
Copper	1,900	1,900	1,800
Iron	NA	NA	NA
Lead	NA	NA	NA
Mercury	NA	NA	NA
Molybdenum	NA	NA	NA
Nickel	NA	NA	NA
Selenium	NA	NA	NA
Silver	NA	NA	NA
Thallium	NA	NA	NA
Vanadium	NA	NA	NA
Zinc	NA	NA	NA
Sodium	NA	NA	NA
SPLP Metals (mg/L)			
Copper	0.041	0.10	0.11

Notes:
Grandby Bay stockpile is the source of all materials analyzed.
(a) = Black Lustre is a Canadian trade name for Tru-Grit material.

Acronyms/Abbreviations:
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
NA = not analyzed
SPLP = synthetic precipitation leaching procedure

Table 2
Leachate Heavy Metal Content
Tru-Grit Site
Tacoma, Washington

Analyte	Result	TCLP-Metals Analysis (Per 40 CFR 261.24) Concentration Unit: mg/L in Leachate			Limit @	EPA Method
		PQL	DF	EPA#		
Arsenic (As)	ND	0.01	1	D004	5.0	6010B
Barium (Ba)	0.820	0.10	1	D005	100.0	6010B
Cadmium (Cd)	ND	0.01	1	D006	1.0	6010B
Chromium (Cr)	ND	0.01	1	D007	5.0	6010B
Lead (Pb)	ND	0.01	1	D008	5.0	6010B
Mercury (Hg)	ND	0.01	1	D009	0.2	7470A
Selenium (Se)	ND	0.10	1	D010	1.0	6010B
Silver (Ag)	ND	0.02	1	D011	5.0	6010B

Notes:

1. Sediment Quality Standards per Washington Administrative Code (WAC) 173-204-320(a)
2. Maximum level per WAC 173-204-420(a)
3. Screening level/minimum per WAC 173-204-520(a)

Acronyms/Abbreviations:

CFR = Code of Federal Regulations
DF = dilution factor
EPA = US Environmental Protection Agency
EPA# = EPA Hazardous Waste Number
Limit @ = EPA Acceptable Land Disposal Limit
mg/L = milligrams per liter
ND = below the actual detection limit or non-detected
PQL = practical quantitation limit
TCLP = toxicity characteristic leaching procedure

Table 3
Historical Bioassay Data
Tru-Grit Site
Tacoma, Washington

Bioassay Testing Services (Tacoma)
Trout Bioassay 3/1990
Ecology 173-303 Method 80-12

Concentration	Mortality
100 mg/L	0/30
1,000 mg/L	5/30

British Columbia Research (a)
Threespined Stickleback Bioassay 4/1993
Saltwater Test

Concentration wt/wt %	% Survival			
	24 hr	48 hr	72 hr	96 hr
22 (b)	100	100	100	100
10	100	100	100	100
4.4	100	100	100	100
1	100	100	100	100
		100		

(b) Saltwater Supernatant Analysis
From 22% Concentration Bioassay Tank
(for select metals)

Analyte	Concentration
Copper	<0.05 mg/L
Chromium	<5 mg/L
Zinc	0.02 mg/L

Notes and Abbreviations:
(a) Reference Toxicant for stickleback 96hLC50 phenol 17.8n and 18.7 mg/L, which compares well with rainbow trout phenol toxicity in fresh water 10-15 mg/L.

% = percent
hr = hour
mg/L = milligrams per liter
wt/wt % = weight per weight percent

Table 4
Mudline Elevation and Sample Locations
Tru-Grit Site
Tacoma, Washington

Location (a)	Mudline Elevation (feet MLLW)	Easting (b)	Northing (b)
Surface Sediment Grabs			
SG-01	4.12	1168480	712777
SG-02	3.78	1168580	712722
SG-03	7.11	1168658	712669
SG-04	10.24	1168655	712613
SG-05	0.3	1168538	712723
SG-06	0.9	1168594	712674
SG-07	0.9	1168643	712620
SG-08	-14.8	1168511	712691
SG-09	-8.7	1168563	712641
SG-10	-6.8	1168611	712599
SG-11	-27.9	1168476	712655
SG-12	-27.1	1168528	712606
SG-13	-28.6	1168581	712554
SG-14	-27.1	1168635	712475
SG-14 (2018)	-28.9	1168632	712477
SG-15	-28.9	1168729	712377
SG-16	-27.5	1168442	712620
SG-16 (2018)	-28.5	1168442	712619
SG-17	-30.6	1168497	712565
SG-17 (2018)	-35.7	1168498	712566
SG-18	-34.0	1168555	712505
SG-19	-39.6	1168653	712402
SG-20	-50.7	1168462	712527
SG-21	-50.4	1168559	712427
SG-22	-51.1	1168667	712314
SG-23	10.3	1168690	712589
SG-24	4.64	1168611	712696
SG-25	-7.6	1168450	712737
SG-26	-17.4	1168422	712708
SG-27	-27.3	1168385	712673
SG-28	-50.8	1168400	712583
BSG-1	-51.6	1168120	712291
BSG-2	-50.7	1167705	713354
G-5 (2018)	-25.3	1168611	712548

Table 4
Mudline Elevation and Sample Locations
Tru-Grit Site
Tacoma, Washington

Location (a)	Mudline Elevation (feet MLLW)	Easting (b)	Northing (b)
Subsurface Sediment Cores			
SC-05	0.5	1168539	712724
SC-07	0.3	1168645	712623
SC-08	-12.3	1168514	712690
SC-09	-8.6	1168565	712645
SC-10	-8.5	1168610	712601
SC-12	-26.7	1168533	712608
SC-13	-27.2	1168583	712552
SC-14	-29.8	1168620	712473
SC-16	-28.3	1168443	712621
SC-17	30.2	1168498	712566
BSC-1	-51.3	1168123	712292
G-5	-20.1	1168613	712549

Notes an Abbreviations:

(a) Washington State Plane Coordinate System North American Datum of 1983

(b) Location from 2014 sampling event unless otherwise noted

MLLW = mean lower low water

Table 5
Preliminary Soil Screening Levels
Tru-Grit Site
Tacoma, Washington

Analyte	Preliminary Groundwater SL Used in Three-Phase Model (µg/L)	MTCA Method B Soil Direct Contact Use Non-Carcinogen	MTCA Method C Soil Direct Contact Industrial Land Use Non-Carcinogen	MTCA Method C Protective of Groundwater as Surface Water (a)	Soil Background Levels (b)	PQL (c)	Proposed Preliminary SL
Metals (mg/kg)							
Copper	2.4	3,200	140,000	1.1	36	0.2	**3,200**
Zinc	81	24,000	1,100,000	101	85	1.0	**24,000**

Notes:

(a) Calculated using fixed parameter three-phase partitioning model, WAC 173-340-747(4) and the preliminary groundwater cleanup level shown in column 2.

(b) From Ecology's Natural Background Soil Metals Concentrations in Puget Sound (Ecology 1994). Used 90th percentile for Puget Sound unless noted otherwise.

(c) The PQL is based on Analytical Resource Inc. laboratory's limit of quantitation for EPA Method 6010C (October 2, 2012).

Grey shading indicates basis for preliminary screening level.

Acronyms/Abbreviations:

µg/L = micrograms per liter
CUL = cleanup level
mg/kg = milligrams per kilogram
MTCA = Model Toxics Control Act
PQL = practical quantitation limit
SL = screening level

Table 6
Preliminary Groundwater Screening Levels
Tru-Grit Site
Tacoma, Washington

Analyte	State and Federal ARARs (a)					MTCA Method B (a)			
	State Marine Chronic Aquatic Life Washington WQS WAC 173-201A	Federal Marine Chronic Aquatic Life CWA Section 304	Federal Marine Chronic Aquatic Life NTR 40 CFR 131	Federal Human Health Consumption of Organisms CWA Section 304	Federal Human Health Consumption of Organisms NTR 40 CFR 131	Human Health MTCA Method B Surface Water Equation 173-340-730 (Non-Carcinogen)	MTCA Method B Ground Water as Drinking Water	PQL(c)	Proposed Preliminary SL (d)
Metals (µg/L)									
Copper	3.1 (b)	3.1 (b)	2.4	--	--	2,900	640	2	**2.4**
Zinc	81 (b)	81 (b)	81 (b)	26,000	--	17000	4,800	10	**81**

Notes:

Grey shading indicates basis for preliminary screening level.

(a) Unless otherwise noted, all federal and state ARARs and MTCA C Cleanup Screening Levels for surface water were identified from Washington State Department of Ecology's online CLARC database (Ecology 2012).

(b) The surface water criterion is based on the dissolved fraction.

(c) The PQL is based on Analytical Resource Inc. laboratory's limit of quantitation for US Environmental Protection Agency Method 6010C (October 2, 2012).

(d) Proposed screening level is based on lowest water quality standard indicated by shading.

Acronyms/Abbreviations:

-- = no criterion available
µg/L = micrograms per liter
ARAR = applicable or relevant and appropriate requirements
CFR = Code of Federal Regulations
CLARC = Cleanup Screening Levels and Risk Calculation
CWA = Clean Water Act
MTCA = Model Toxics Control Act
NTR = National Toxics Rule
PQL = practical quantitation limit
SL = screening level
WAC = Washington Administrative Code
WQS = Water Quality Standard

Table 7
Preliminary Sediment Screening Levels
Tru-Grit Site
Tacoma, Washington

Analyte	SCO WAC 173-204 (a)	CSL WAC 173-204 (b)	SCO Dry Weight Equivalent (b)	CSL Dry Weight Equivalent (c)	Recommended Practical Quantitation Limits
Metals	mg/kg - dry weight	mg/kg - dry weight	mg/kg - dry weight	mg/kg - dry weight	mg/kg dry weight
Arsenic	57	93	57	93	19
Copper	390	390	390	390	130
Zinc	410	960	410	960	137

Notes:

Grey shading indicates basis for preliminary screening level.

(a) Marine sediment cleanup objectives set forth in WAC 173-204-562, unless otherwise indicated.

(b) Dry weight equivalent criteria are based on the Puget Sound Apparent Effect Threshold Values (Barrick et al. 1988)

Acronyms/Abbreviations:

CSL = Cleanup Screening Levels
mg/kg = milligrams per kilogram
SCO = Sediment Cleanup Objectives
WAC = Washington Administrative Code

Table 8
Soil Analytical Results
Tru-Grit Site
Tacoma, Washington

Sample Location	Laboratory Sample ID	Sample Date	Total Metals (mg/kg; SW-846 6020)	
			Copper	Zinc
Preliminary Screening Level			3,200	24,000
U-1	580-38132-4	4/18/2013	**110**	**310**
U-2	580-38132-6	4/18/2013	**63**	**130**
U-3	580-38132-2	4/18/2013	**79**	**180**
U-4	580-38132-3	4/18/2013	**34**	**76**
U-5	580-38132-5	4/18/2013	**120**	**230**
U-6	580-38132-1	4/18/2013	**86**	**170**

Notes:

Bold text indicates detected analyte

Acronyms/Abbreviations:

-- = not analyzed

ID = identification

mg/kg = milligrams per kilogram

Table 9
Groundwater Analytical Results
Tru-Grit Site
Tacoma, Washington

Sample Location	Laboratory Sample ID	Sample Date	Dissolved Metals (mg/L; SW-846 6020)	
			Copper	Zinc
Preliminary Screening Level			0.0024	0.081
Seep-1	580-38132-7	4/18/2013	**0.0012 J**	0.0070 U
Seep-2	580-38132-8	4/18/2013	**0.0095**	**0.0049 J**
Seep-2-Dup	580-38132-9	4/18/2013	**0.0096**	**0.0049 J**
Seep-2	580-77368-1	5/17/2018	0.0020 U	--
Seep-2-Dup	580-77368-2	5/17/2018	0.0020 U	--
Seep-2	580-80164-1	9/7/2018	0.0020 U	--
Seep-2-Dup	580-80164-2	9/7/2018	0.0020 U	--

Notes:

Bold text indicates detected analyte.

Green shading indicates detected analyte exceeds applicable cleanup level.

J = Result is less than the reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

U = Indicates the compound was not detected at the reported concentration.

Acronyms/Abbreviations:

-- = not analyzed

ID = identification

mg/L = milligrams per liter

Table 10
Surface Water Analytical Results
Tru-Grit Site
Tacoma, Washington

Analyte	Sample Location, Sample Date, Sample Type, Laboratory Sample ID		
	Marine-60 1/25/2018 580-74669-1	Marine-60-Dup 1/25/2018 580-74669-3	Marine-120 1/25/2018 580-74669-2
Dissolved Metals (mg/L; SW-846 6020A)			
Copper	**0.0012 J**	**0.0013 J**	**0.00096 J**

Notes:

Bold text indicates detected analyte

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Acronyms/Abbreviations:

ID = identification

mg/L = milligrams per liter

Table 11
Approximate Visual Grit Content in Sediment
Tru-Grit Site
Tacoma, Washington

Surface Sediment		
Sample Location (a)	**Sample Depth**	***Approximate Visual Grit Content***
SG-01	0-10 cm	no grit apparent
SG-02	0-10 cm	no grit apparent
SG-03	0-10 cm	no grit apparent
SG-04	0-10 cm	<5%
SG-05	0-10 cm	<5%
SG-06	0-10 cm	no grit apparent
SG-07	0-10 cm	<5%
SG-08	0-10 cm	<5%
SG-09	0-10 cm	<5%
SG-10	0-10 cm	<5%
SG-11	0-10 cm	no grit apparent
SG-12	0-10 cm	5%-15%
SG-13	0-10 cm	no grit apparent
SG-14	0-10 cm	5%-15%
SG-14 (2018)	0-10 cm	5%
SG-15	0-10 cm	5%-15%
SG-16	0-10 cm	+15%
SG-16 (2018)	0-10 cm	16%
SG-17	0-10 cm	+15%
SG-17 (2018)	0-10 cm	4%
SG-18	0-10 cm	<5%
SG-19	0-10 cm	no grit apparent
SG-20	0-10 cm	no grit apparent
SG-21	0-10 cm	no grit apparent
SG-22	0-10 cm	<5%
SG-23	0-10 cm	+15%
SG-24	0-10 cm	no grit apparent
SG-25	0-10 cm	no grit apparent
SG-26	0-10 cm	no grit apparent
SG-27	0-10 cm	no grit apparent
SG-28	0-10 cm	no grit apparent
G-5	0-1 ft	+15%
G-5 (2018)	0-10 cm	11%
BSG-1	0-10 cm	no grit apparent
BSG-2	0-10 cm	no grit apparent

Subsurface Sediment		
Sample Location (a)	**Sample Depth**	***Approximate Visual Grit Content***
SC-05	0-1 ft	<5%
SC-05	1-8 ft	no grit apparent
SC-07	0-1 ft	<5%
SC-07	1-8 ft	no grit apparent
SC-08	0-1 ft	<5%
SC-08	1-8 ft	no grit apparent
SC-09	0-1 ft	<5%
SC-09	1-8 ft	no grit apparent
SC-10	0-1 ft	<5%
SC-10	1-9 ft	no grit apparent
SC-12	0-1 ft	5%-15%
SC-12	1-2 ft	<5%
SC-12	2-8.8 ft	no grit apparent
SC-13	0-1 ft	no grit apparent
SC-13	1-3 ft	5%-15%
SC-13	3-5 ft	+15%
SC-13	5-7 ft	no grit apparent
SC-14	0-2 ft	5%-15%
SC-14	2-3 ft	<5%
SC-14	3-7.3 ft	no grit apparent
SC-14A	3-3.1 ft	+15%
SC-16	0-1 ft	+15%
SC-16	1-3 ft	<5%
SC-16	3-8 ft	no grit apparent
SC-17	0-1 ft	+15%
SC-17	1-2 ft	5%-15%
SC-17	2-3 ft	+15%
SC-17	3-4 ft	<5%
SC-17	4-7.2 ft	no grit apparent
G-5	0-3 ft	+15%
G-5	3-4ft	5%-15%
G-5	4-5 ft	<5%
G-5	5-8 ft	no grit apparent
BSC-1	0-8 ft	no grit apparent

Notes and Abbreviations:

(a) All grit content results were collected in 2014 unless otherwise indicated.

% = percent
cm = centimeters
ft = feet

Table 12
Sediment Analytical Results, Metals
Tru-Grit Site
Tacoma, Washington

Sample Location	Laboratory Sample ID	Sample Date	Arsenic	Copper	Zinc
		PSL (a)	57	390	410
Total Metals (mg/kg dw; SW-846 6020/7471A)					
Surface Sediment					
SG-01	580-41997-1	1/14/2014	**6.7**	**52**	**85**
SG-02	580-41997-2	1/14/2014	**2.0**	**12**	**48**
SG-03	580-41997-4	1/14/2014	**7.3**	**12**	**36**
SG-04	580-41997-5	1/14/2014	**66**	**160**	**380**
SG-05	580-41982-1	1/14/2014	**6.2**	**36**	**120**
SG-06	580-41982-2	1/14/2014	**2.4**	**20**	**32**
SG-07	580-41982-3	1/14/2014	**21**	**76**	**130**
SG-08	580-41982-5	1/14/2014	**4.5**	**24**	**42**
SG-09	580-41982-4	1/14/2014	**17**	**58**	**110**
SG-10	580-41997-11	1/15/2014	**7.8**	**35**	**78**
SG-11	580-41982-6	1/14/2014	**16**	**45**	**84**
SG-12	580-41982-7	1/14/2014	**38**	**180**	**450**
SG-13	580-41997-13	1/15/2014	**13**	**58**	**170**
SG-14	580-41997-14	1/15/2014	**6.6**	**200**	**650**
SG-14	580-74664-2	1/25/2018	**8.5**	**43** J	**77**
SG-15	580-41997-7	1/15/2014	**38**	**250**	**630**
SG-16	580-41982-9	1/14/2014	**11**	**360**	**1200**
SG-16	580-74664-3	1/25/2018	**14**	**75**	**150**
SG-17	580-41982-12	1/14/2014	**31**	**550**	**1700**
SG-17	580-74664-4	1/25/2018	**81**	**97**	**240**
SG-17-Dup	580-74664-5	1/25/2018	**70**	**110**	**250**
SG-18	580-41997-15	1/15/2014	**45**	**100**	**170**
SG-19	580-41982-8	1/14/2014	**7.4**	**46**	**74**
SG-20	580-41997-9	1/15/2014	**5.6**	**34**	**79** J
SG-20-Dup	580-41997-10	1/15/2014	**5.1**	**29**	**46** J
SG-21	580-41997-8	1/15/2014	**6.4**	**33**	**56**
SG-22	580-41982-11	1/14/2014	**8.2**	**34**	**52**
SG-23	580-41997-6	1/14/2014	**140**	**420**	**1200**
SG-24	580-41997-3	1/14/2014	**1.5**	**11**	**24**
SG-25	580-41998-1	1/16/2014	**7.3**	**36** J	**51**
SG-26	580-41998-2	1/16/2014	**4.0**	**23**	**32**
SG-27	580-41998-3	1/16/2014	**8.1**	**28**	**42**
SG-28	580-41998-4	1/16/2014	**5.3**	**36**	**49**
BSG-1	580-41982-10	1/14/2014	**4.7**	**31**	**56**
BSG-2	580-41997-12	1/15/2014	**1.5**	**15**	**19**
G-B2		5/20/2008	**185**	**231**	**665**
G-5	580-74664-1	1/25/2018	**11**	**120**	**390**
Carr Inlet Reference	580-75361-1	1/26/2018	**3.2**	**13**	**33**

Table 12
Sediment Analytical Results, Metals
Tru-Grit Site
Tacoma, Washington

Sample Location	Laboratory Sample ID	Sample Date	Arsenic	Copper	Zinc
		PSL (a)	57	390	410
Subsurface Sediment					
SC-05(1-2)	580-42028-39	1/21/2014	**5.0**	**24**	**44**
SC-05(2-3)	580-42028-40	1/21/2014	**4.9**	**17**	**28**
SC-07(1-2)	580-42028-27	1/21/2014	**52**	**160**	**380**
SC-07(2-3)	580-42028-28	1/21/2014	**27**	**98**	**290**
SC-08(1-2)	580-42028-56	1/21/2014	**4.4**	**23**	**39**
SC-08(1-2)-Dup	580-42028-53	1/21/2014	**3.7**	**22**	**42**
SC-08(2-3)	580-42028-57	1/21/2014	**5.2** J	**29**	**32**
SC-08(2-3)-Dup	580-42028-54	1/21/2014	**7.6** J	**29**	**37**
SC-09(1-2)	580-42028-6	1/21/2014	**8.2**	**39**	**46**
SC-09(2-3)	580-42028-7	1/21/2014	**4.0**	**27**	**31**
SC-10 (2-3)	580-41998-5	1/16/2014	**31**	**120**	**190**
SC-10 (3-4)	580-41998-6	1/16/2014	**3.8**	**27**	**36**
SC-12 (1-2)	580-41998-12	1/16/2014	**120**	**210**	**450**
SC-12 (2-3)	580-41998-13	1/16/2014	**49**	**47**	**66**
SC-13(3-4)	580-42028-12	1/21/2014	**1500**	**740**	**3900**
SC-13(5-6)	580-42028-13	1/21/2014	**56** J	**48** J	**160** J
SC-14a(3-3.1) (b)	580-42028-63	1/21/2014	**670**	**1400**	**1800**
SC-14(1-2)	580-42028-21	1/21/2014	**310**	**810**	**1000**
SC-14(2-3)	580-42028-22	1/21/2014	**200**	**780**	**700**
SC-16(1-2)	580-42028-15	1/21/2014	**79**	**260**	**500**
SC-16(2-3)	580-42028-16	1/21/2014	**99**	**330**	**380**
SC-17(2-3)	580-42028-1	1/21/2014	**1100**	**2000**	**3000**
SC-17(3-4)	580-42028-2	1/21/2014	**110**	**490**	**610**
G-5(2-3)	580-42028-34	1/21/2014	**8.4**	**2600**	**8900**
G-5(4-5)	580-42028-35	1/21/2014	**68**	**580**	**1100**
BSC-1(1-2)	580-42028-46	1/21/2014	**3.3**	**19**	**29**
BSC-1(2-3)	580-42028-47	1/21/2014	**4.0**	**16**	**30**

Notes and Abbreviations:

(a) Sediment Management Standards Sediment Cleanup Objective (Washington Administrative Code 173-204)

(b) The sample identification at this location is Chunk-1. All SG samples are surface grabs and are from the top 10 centimeters.

J = Indicated the analyte was positively identified; the associated number value is the approximate concentration of the analyte in the sample.

Bold = detected compound

Green shading = exceedance of PSL

dw = dry weight

mg/kg = milligrams per kilogram

PSL = preliminary screening levels

Table 13
Sediment Analytical Results, SMS Suite
Tru-Grit Site
Tacoma, Washington

Analyte	SMS Criteria		Sample Location, Laboratory Sample ID, Sample Date							
	Sediment Cleanup Objective (a)	Cleanup Screening Level (b)	SG-10 580-41997-11 1/15/2014	SG-13 580-41997-13 1/15/2014	G-5 580-74664-1 1/25/2018	SG-14 580-74664-2 1/25/2018	SG-16 580-74664-3 1/25/2018	SG-17 580-74664-4 1/25/2018	SG-17-Dup 580-74664-5 1/25/2018	Carr Inlet Reference 580-75361-1 1/26/2018
Total Metals (mg/kg; SW-846 6020/7471A)										
Arsenic	57	93	**7.8**	**13**	**11**	**8.5**	**14**	**81**	**70**	**3.2**
Cadmium	5.1	6.7	**0.14** J	**1.0**	**0.33**	0.23 U	0.24 U	**0.23**	**0.24**	--
Chromium	260	270	**13**	**20**	**38**	**17**	**18**	**25**	**23**	--
Copper	390	390	**35**	**58**	**120**	**43 J**	**75**	**97**	**110**	**13**
Lead	450	530	**16**	**27**	**16**	**13**	**16**	**55**	**59**	--
Mercury	0.41	0.59	**0.026**	**0.078**	**0.048**	**0.045**	**0.05**	**0.12**	**0.11**	--
Nickel	N/A	N/A	**7.1**	**13**	**11**	**11**	**11**	**15**	**16**	--
Silver	6.1	6.1	**0.053** J	**0.13** J	**0.18**	0.11 U	**0.13**	**0.21**	**0.2**	--
Zinc	410	960	**78**	**170**	**390**	**77**	**150**	**240**	**250**	**33**
PCBs (mg/kg OC; SW-846 8082) (c)										
Aroclor 1016	N/A	N/A	--	--	0.059 U	0.16 U	0.20 U	0.19 U	0.20 U	--
Aroclor 1221	N/A	N/A	--	--	0.067 U	0.18 U	0.21 U	0.22 U	0.21 U	--
Aroclor 1232	N/A	N/A	--	--	0.067 U	0.18 U	0.21 U	0.22 U	0.21 U	--
Aroclor 1242	N/A	N/A	--	--	0.059 U	0.16 U	0.20 U	0.19 U	0.20 U	--
Aroclor 1248	N/A	N/A	--	--	0.067 U	0.18 U	0.213 U	0.22 U	0.21 U	--
Aroclor 1254	N/A	N/A	--	--	**0.41**	**0.55**	**0.40**	**2.5**	**2.1**	--
Aroclor 1260	N/A	N/A	--	--	0.059 U	0.16 U	0.20 U	0.19 U	0.20 U	--
Total PCBs	12	65	2.83 U	**0.789**	**0.41**	**0.55**	**0.40**	**2.5**	**2.1**	--
SVOCs (mg/kg OC; SW-846 8270C)										
Naphthalene	99	170	**0.89 J**	1.37 U	**0.24 J**	**0.67**	**0.79**	**0.60**	**0.86**	--
Acenaphthylene	66	66	**1.59**	**1.00 J**	**0.52**	**0.61**	**0.56**	**0.53**	**0.59**	--
Acenaphthene	16	57	**1.74**	**1.00 J**	**0.59**	**0.67**	**0.48**	**0.55**	**0.53**	--
Fluorene	23	79	**2.61**	**1.47**	**0.74**	**0.90**	**0.68**	**0.71 J**	**2.5 J**	--
Phenanthrene	100	480	**21.1**	**7.37**	**3.1 J**	**5.0**	**5.1**	**3.6 J**	**7.1 J**	--
Anthracene	220	1200	**6.96**	**5.26**	**1.7 J**	**2.5**	**2.0**	**1.9 J**	**4.9 J**	--
2-Methylnaphthalene	38	64	**0.61 J**	**0.53 J**	0.30 U	0.82 U	0.97 U	0.97 U	0.97 U	--
LPAH (c,d)	370	780	**34.9**	**16.1**	**6.9 J**	**10**	**9.6**	**8.0 J**	**16 J**	--
Fluoranthene	160	1200	**45.7**	**28.9**	**24 J**	**17**	**19**	**12**	**14**	--
Pyrene	1000	1400	**54.3**	**28.4**	**18 J**	**20**	**17**	**12**	**16**	--
Benzo[a]anthracene	110	270	**21.5**	**12.6**	**10 J**	**7.0**	**5.5**	**5.1**	**6.4**	--
Chrysene	110	460	**39.1**	**21.1**	**15 J**	**13**	**11**	**7.1**	**10**	--
Benzofluoranthene	230	450	**41.3**	**26.3**	**14 J**	**18**	**13**	**13**	**16**	--
Benzo[a]pyrene	99	210	**19.6**	**12.1**	**5.6 J**	**7.6**	**5.6**	**5.2**	**6.6**	--
Indeno[1,2,3-cd]pyrene	34	88	**12.6**	**6.32**	**1.9 J**	**2.5**	**1.7**	**1.7**	**2.1**	--
Dibenz(a,h)anthracene	12	33	**3.48**	**1.68 J**	**0.52 J**	0.82 U	0.97 U	0.97 U	0.97 U	--
Benzo[g,h,i]perylene	31	78	**9.35**	**4.58**	**1.5 J**	**2.2**	**1.3**	**1.2**	**1.7**	--
HPAH (c,e,f)	960	5300	**247**	**142**	**90 J**	**87**	**75**	**58**	**73**	--
1,2-Dichlorobenzene	2.3	2.3	3.91 U	3.74 U	0.30 UJ	0.82 U	0.97 U	0.97 U	0.97 U	--
1,4-Dichlorobenzene	3.1	9	3.48 U	3.42 U	0.30 UJ	0.82 U	0.97 U	0.97 U	0.97 U	--
1,2,4-Trichlorobenzene	0.81	1.8	3.48 U	3.42 U	0.30 U	0.82 U	0.97 U	0.97 U	0.97 U	--
Hexachlorobenzene	0.38	2.3	3.48 U	3.42 U	0.30 U	0.82 U	0.97 U	0.97 U	0.97 U	--
Dimethyl phthalate	53	53	6.96 U	6.84 U	0.89 U	2.5 U	2.9 U	3.0 U	2.9 U	--

Table 13
Sediment Analytical Results, SMS Suite
Tru-Grit Site
Tacoma, Washington

Analyte	SMS Criteria		Sample Location, Laboratory Sample ID, Sample Date							
	Sediment Cleanup Objective (a)	Cleanup Screening Level (b)	SG-10 580-41997-11 1/15/2014	SG-13 580-41997-13 1/15/2014	G-5 580-74664-1 1/25/2018	SG-14 580-74664-2 1/25/2018	SG-16 580-74664-3 1/25/2018	SG-17 580-74664-4 1/25/2018	SG-17-Dup 580-74664-5 1/25/2018	Carr Inlet Reference 580-75361-1 1/26/2018
Diethyl phthalate	61	110	13.9 U	13.7 U	3.3 U	9.0 U	11 U	11 U	11 U	--
Di-n-butyl phthalate	220	1700	34.8 U	34.2 U	3.0 U	8.2 U	9.7 U	9.7 U	9.7 U	--
Butyl benzyl phthalate	4.9	64	**3.91 J**	13.7 U	1.2 U	3.3 U	3.9 U	3.9 U	3.9 U	--
Bis(2-ethylhexyl) phthalate	47	78	**8.91 J**	**6.32 J**	3.6 U	9.9 U	12 U	12 U	12 U	--
Di-n-octyl phthalate	58	4500	34.78 U	**1.16 J**	R	16 U	20 U	19 U	20 U	--
Dibenzofuran	15	58	**1.20 J**	**0.74 J**	0.89 U	2.5 U	2.9 U	3.0 U	2.9 U	--
Hexachlorobutadiene	3.9	6.2	3.48 U	3.42 U	0.30 U	0.82 U	0.97 U	0.97 U	0.97 U	--
N-Nitrosodiphenylamine	11	11	3.48 U	3.42 U	0.36 U	0.99 U	1.2 U	1.2 U	1.2 U	--
SVOCs (mg/kg; SW-846 8270C)										
Phenol	0.42	1.2	0.0051 U	0.13 U	0.024 U	0.022 U	0.022 U	0.023 U	0.022 U	--
2-Methylphenol	0.063	0.063	0.032 U	0.13 U	0.024 U	0.022 U	0.022 U	0.023 U	0.022 U	--
3 & 4 Methylphenol	0.67	0.67	0.064 U	0.26 U	0.032 U	0.029 U	0.029 U	0.03 U	0.03 U	--
2,4-Dimethylphenol	0.029	0.029	0.032 U	0.13 U	0.016 UJ	0.014 UJ	0.015 UJ	0.015 UJ	0.015 UJ	--
Pentachlorophenol	0.36	0.69	**0.033 J**	**0.12 J**	0.064 U	0.058 U	0.058 U	0.06 U	0.059 U	--
Benzyl alcohol	0.057	0.073	0.032 U	0.13 U	0.64 UJ	0.58 UJ	0.58 UJ	0.60 UJ	0.59 UJ	--
Benzoic acid	0.65	0.65	0.800 U	3.2 U	0.40 U	0.36 U	0.36 U	0.38 U	0.37 U	--
Carbazole	N/A	N/A	--	--	0.024 U	0.022 U	0.022 U	0.023 U	0.022 U	--
CONVENTIONALS (%; SW-846 9060A)										
Total Organic Carbon	10 (g)	--	**0.46**	**1.9**	**2.7**	**0.88**	**0.75**	**0.77**	**0.76**	**0.64 J**

Table 13
Sediment Analytical Results, SMS Suite
Tru-Grit Site
Tacoma, Washington

Notes:

1. All SG samples are surface grabs and are from the top 10 centimeters.

(a) Sediment Management Standards (SMS) Sediment Cleanup Objective [Washington Administrative Code (WAC) 173-204].

(b) SMS Cleanup Screening Level (WAC 173-204).

(c) Where chemical criteria in this table represent the sum of individual compounds or isomers, the following methods shall be applied:

(i) Where chemical analyses identify an undetected value for every individual compound/isomer, then the single highest detection limit shall represent the sum of the respective compounds/isomers.

(ii) Where chemical analyses detect one or more individual compounds/isomers, only the detected concentrations will be added to represent the group sum.

(d) The LPAH criterion represents the sum of the following "low molecular weight polynuclear aromatic hydrocarbon" compounds: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene. The LPAH criterion is not the sum of the criteria values for the individual LPAH compounds listed.

(e) The total benzofluoranthenes criterion represents the sum of the concentrations of the "B," "J," and "K" isomers.

(f) The HPAH criterion represents the sum of the following "high molecular weight polynuclear aromatic hydrocarbon" compounds: fluoranthene, pyrene, benzo(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene. The HPAH criterion is not the sum of the criteria values for the individual HPAH compounds as listed.

(g) DMMP clarification paper and SMS technical information memorandum: Management of Wood Waste Under Dredged Material Management Program and the SMS Cleanup Program.

J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = Indicates the compound was not detected at the reported concentration.

Green shading = exceedance of SMS criteria

Bold = detected compound

Abbreviations and Acronyms:

-- = not analyzed

% = percent

HPAH = high molecular weight polycyclic aromatic hydrocarbon

LPAH = low molecular weight polycyclic aromatic hydrocarbon

mg/kg = milligrams per kilogram

N/A = not applicable

OC = organic carbon normalized

PCB = polychlorinated biphenyl

SVOC = semivolatile organic compound

Table 14
Bioassay Results
Tru-Grit Site
Tacoma, Washington

Sample Location	Sample Date	Sediment Cleanup Objectives			Cleanup Screening Levels		
		Amphipod	Polychaete	Larval	Amphipod	Polychaete	Larval
G-5	1/25/2018	Pass	Pass	Pass	Pass	Pass	Pass
SG-14	1/25/2018	Pass	Pass	Pass	Pass	Pass	Pass
SG-16	1/25/2018	Pass	Pass	Fail	Pass	Pass	Pass
SG-17	1/25/2018	Pass	Pass	Fail	Pass	Pass	Pass

APPENDIX A

Logs of Explorations

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL[1]	TYPICAL DESCRIPTIONS [2][3]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		GW	Well-graded gravel; gravel/sand mixture(s); little or no fines
				GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		GM	Silty gravel; gravel/sand/silt mixture(s)
				GC	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		SW	Well-graded sand; gravelly sand; little or no fines
				SP	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		SM	Silty sand; sand/silt mixture(s)
				SC	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)			ML	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
				CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
				OL	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)			MH	Inorganic silt; micaceous or diatomaceous fine sand
				CH	Inorganic clay of high plasticity; fat clay
				OH	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL			PT	Peat; humus; swamp soil with high organic content

OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		AC or PC	Asphalt concrete pavement or Portland cement pavement
ROCK		RK	Rock (See Rock Classification)
WOOD		WD	Wood, lumber, wood chips
DEBRIS		DB	Construction debris, garbage

Notes:
1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
2. Soil descriptions are based on the general approach presented in the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the Standard Test Method for Classification of Soils for Engineering Purposes, as outlined in ASTM D 2487.
3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

Primary Constituent:	> 50%	"GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50%	"very gravelly," "very sandy," "very silty," etc.
	> 15% and ≤ 30%	"gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 15%	"with gravel," "with sand," "with silt," etc.
	≤ 5%	"with trace gravel," "with trace sand," "with trace silt," etc., or not noted.

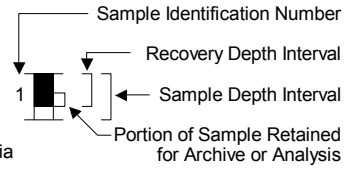
4. Soil density or consistency descriptions are based on judgement using a combination of sampler penetration blow counts, drilling or excavating conditions, field tests, and laboratory tests, as appropriate.

Drilling and Sampling Key

SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Single-Tube Core Barrel
f	Double-Tube Core Barrel
g	2.50-inch O.D., 2.00-inch I.D. WSDOT
h	3.00-inch O.D., 2.375-inch I.D. Mod. California
i	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Vibrocore (Rotosonic/Geoprobe)
5	Other - See text if applicable

SAMPLE NUMBER & INTERVAL



Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
GT	Other Geotechnical Testing
CA	Chemical Analysis

Groundwater

▽ Approximate water level at time of drilling (ATD)

▼ Approximate water level at time other than ATD

LANDAU ASSOCIATES

Tru Grit
Tacoma, Washington

Soil Classification System and Key

Figure A-1

SC-05

SAMPLE DATA				SEDIMENT DESCRIPTION		
Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	Coring Method: Vibracorer Elevation (ft): +0.5 MLLW
0					ML	Gray SILT with <5% grit (no odor, no sheen)
					SP-SM	Dark gray, fine to medium SAND with silt with no apparent grit (no odor, no sheen)
		SC-05(1-2)				
2						
		SC-05(2-3)				
4						
6						
8						
10						

Coring Completed 01/17/14
Core logged and sampled by SDS on 1/21/2014
Total Penetration = 8.0 ft.

Point located at State Plane Coordinates:
North: 712715.00
East: 1168530.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.2 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

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Tru Grit
Tacoma, Washington

Log of Sediment Core SC-05

Figure
A-2

SC-07

SAMPLE DATA				SEDIMENT DESCRIPTION		
Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	
0					SM	Coring Method: Vibracorer Elevation (ft): +0.3 MLLW Dark gray, very silty fine to medium SAND with <5% grit (no odor, no sheen)
						no apparent grit
		SC-07(1-2)				
2						
		SC-07(2-3)				
4						
					SM	Dark gray, silty fine to medium SAND (no odor, no sheen)
6						
8						
10						

Coring Completed 01/17/14
Core logged and sampled by SDS on 1/21/2014
Total Penetration = 8.0 ft.

Point located at State Plane Coordinates:
North: 712625.00
East: 1168632.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.3 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

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Tru Grit
Tacoma, Washington

Log of Sediment Core SC-07

Figure
A-3

SC-08

SAMPLE DATA				SEDIMENT DESCRIPTION		
Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	Coring Method: Vibracorer Elevation (ft): -12.3 MLLW
0					SM	Gray, very silty fine SAND with <5% grit (no odor, no sheen)
					SM	Gray, very silty fine to medium SAND with no apparent grit (no odor, no sheen)
		SC-08(1-2)				
2						
		SC-08(2-3)				
4						
					ML	Tan SILT (no odor, no sheen)
6						
8						
10						

Coring Completed 01/17/14
Core logged and sampled by SDS on 1/21/2014
Total Penetration = 8.0 ft.

Point located at State Plane Coordinates:
North: 712689.00
East: 1168509.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.4 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

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Tru Grit
Tacoma, Washington

Log of Sediment Core SC-08

Figure
A-4

SC-09

SAMPLE DATA				SEDIMENT DESCRIPTION		
Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	Coring Method: Vibracorer Elevation (ft): -8.6 MLLW
0		SC-09(1-2)			SP	Dark gray, fine to medium SAND with <5% grit (no odor, no sheen) no apparent grit
2		SC-09(2-3)			ML	Tan, sandy SILT with shell fragments (sulfur odor, no sheen)
4					SM	Gray, fine to medium SAND with silt (sulfur odor, no sheen)
					CL	Tan, silty CLAY (slight sulfur odor, no sheen)
6						
8						
10						

Coring Completed 01/17/14
Core logged and sampled by SDS on 1/21/2014
Total Penetration = 8.0 ft.

Point located at State Plane Coordinates:
North: 712639.00
East: 1168562.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.5 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

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Tru Grit
Tacoma, Washington

Log of Sediment Core SC-09

Figure
A-5

SC-10

SAMPLE DATA

SEDIMENT DESCRIPTION

Coring Method: Vibracorer

Elevation (ft): -8.5 MLLW

Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	Description
0					SP	Dark gray, silty, fine to coarse SAND with trace shell fragments with <5% grit (no odor, no sheen)
						no apparent grit
2		SC-10(2-3)				
					ML	Light gray, SILT
		SC-10(3-4)				
4						
6					SP	Gray, silty fine to coarse SAND (no odor, no sheen)
8					ML	Light gray to tan, SILT with small (<2 in.) wood fragments (no odor, no sheen)
10						

Coring Completed 01/16/14
Core logged and sampled by SDS on 1/16/2014
Total Penetration = 9.0 ft.

Point located at State Plane Coordinates:
North: 712599.00
East: 1168611.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.6 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

LANDAU ASSOCIATES

Tru Grit
Tacoma, Washington

Log of Sediment Core SC-10

Figure
A-6

SC-12

SAMPLE DATA

SEDIMENT DESCRIPTION

Coring Method: Vibracorer

Elevation (ft): -26.7 MLLW

Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	Description
0					ML	Dark gray, sandy SILT with between 5-15% grit (sulfur odor, no sheen)
						<5% grit
		SC-12(1-2)				
2						no apparent grit
		SC-12(2-3)				
					ML	Light tan to gray, sandy SILT (sulfur odor, no sheen)
4						
					SP	Gray, fine to medium SAND (no odor, no sheen)
6						
					SM	Brown, very silty fine SAND (sulfur odor, no sheen)
8						
10						

Coring Completed 01/16/14
Core logged and sampled by SDS on 1/16/2014
Total Penetration = 8.8 ft.

Point located at State Plane Coordinates:
North: 712607.00
East: 1168529.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.7 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

LANDAU ASSOCIATES

Tru Grit
Tacoma, Washington

Log of Sediment Core SC-12

Figure
A-7

SC-13

SAMPLE DATA				SEDIMENT DESCRIPTION		
Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	Coring Method: Vibracorer Elevation (ft): -27.2 MLLW
0					ML	Dark gray to black, sandy SILT with no apparent grit (no odor, no sheen)
						between 5-15% grit
2						
					SP	Black, fine to medium SAND with +15% grit (no odor, no sheen)
		SC-13(3-4)				
4						
					ML	Gray SILT with sand and small (<2 in.) wood fragments with no apparent grit (slight sulfur odor, no sheen)
		SC-13(5-6)				
6						
8						
10						

Coring Completed 01/20/14
Core logged and sampled by SDS on 1/21/2014
Total Penetration = 7.3 ft.

Point located at State Plane Coordinates:
North: 712556.00
East: 1168583.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.8 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

LANDAU ASSOCIATES

Tru Grit
Tacoma, Washington

Log of Sediment Core SC-13

Figure
A-8

SC-14

SAMPLE DATA				SEDIMENT DESCRIPTION		
Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	Coring Method: Vibracorer Elevation (ft): -29.8 MLLW
0					ML	Dark gray, very sandy SILT with 5 - 15% grit and small (<3 in. in length) scraps of aluminum (no odor, no sheen)
		SC-14(1-2)				
2						<5% grit
		SC-14(2-3)				
					SM	Dark gray, silty fine to medium SAND with trace shell fragments with no apparent grit (no odor, no sheen)
4						
6						
8						
10						

Coring Completed 01/20/14
Core logged and sampled by SDS on 1/21/2014
Total Penetration = 7.3 ft.

Point located at State Plane Coordinates:
North: 712473.00
East: 1168620.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.9 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

LANDAU ASSOCIATES

Tru Grit
Tacoma, Washington

Log of Sediment Core SC-14

Figure
A-9

SC-16

SAMPLE DATA				SEDIMENT DESCRIPTION		
Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	Coring Method: Vibracorer Elevation (ft): -28.3 MLLW
0					ML	Dark brown, sandy SILT, with +15% grit (no odor, no sheen)
						<5% grit
		SC-16(1-2)				
2						
		SC-16(2-3)				
						no apparent grit
4					SM	Brown, very silty fine to medium SAND with shell fragments (no odor, no sheen)
						- bent aluminum wire (thickness of a coathanger) in sediment at 4.5 ft
6						
8						
10						

Coring Completed 01/17/14
Core logged and sampled by SDS on 1/21/2014
Total Penetration = 8.0 ft.

Point located at State Plane Coordinates:
North: 712622.00
East: 1168440.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.10 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

LANDAU ASSOCIATES

Tru Grit
Tacoma, Washington

Log of Sediment Core SC-16

Figure
A-10

SC-17

SAMPLE DATA

SEDIMENT DESCRIPTION

Coring Method: Vibracorer

Elevation (ft): -30.2 MLLW

Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	Description
0					SM	Dark gray, sandy SILT with +15% grit material (no odor, no sheen)
						with 5 - 15% grit
2					SP	Black, fine to medium SAND with silt, with +15% grit (no odor, no sheen)
		SC-17(2-3)				
						with <5% grit
		SC-17(3-4)				
4					SM	Dark gray, sandy SILT with no apparent grit (no odor, no sheen)
					SP	Gray, fine to medium SAND with silt (no odor, no sheen)
6						
8						
10						

Coring Completed 01/20/14
Core logged and sampled by SDS on 1/21/2014
Total Penetration = 7.2 ft.

Point located at State Plane Coordinates:
North: 712567.00
East: 1168500.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.11 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

LANDAU ASSOCIATES

Tru Grit
Tacoma, Washington

Log of Sediment Core SC-17

Figure
A-11

BSC-1

SAMPLE DATA				SEDIMENT DESCRIPTION		
Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	Coring Method: Vibracorer Elevation (ft): -51.3 MLLW
0					SM	Gray,very silty fine to medium SAND with no apparent grit (no odor, no sheen)
		BSC-1(1-2)			SM	Gray, very silty fine to coarse SAND with shell fragments with no apparent grit (no odor, no sheen)
2		BSC-1(2-3)				
4					SM	Gray, very silty fine SAND with no apparent grit (no odor, no sheen)
6						
8						
10						

Coring Completed 01/17/14
Core logged and sampled by SDS on 1/21/2014
Total Penetration = 8.0 ft.

Point located at State Plane Coordinates:
North: 712292.00
East: 1168123.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.12 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

LANDAU ASSOCIATES

Tru Grit
Tacoma, Washington

Log of Sediment Core BSC-1

Figure
A-12

G-5

SAMPLE DATA				SEDIMENT DESCRIPTION		
Depth (ft)	Elevation	In situ Sample Interval (ft)	Test Data	Graphic Symbol	USCS Symbol	Coring Method: Vibracorer Elevation (ft): -20.1 MLLW
0					ML	Dark gray to black, sandy SILT with shell fragments, with +15% grit (sulfur odor, no sheen)
2		G-5(2-3)				between 5 -15% grit
4		G-5(4-5)			SM	Dark gray to black, silty fine SAND with shell fragments with <5% grit (sulfur odor, no sheen) no apparent grit
6					SM	Dark gray to blackm very silty fine SAND with shell fragments (sulfur odor, no sheen)
8						
10						

Coring Completed 01/20/14
Core logged and sampled by SDS on 1/21/2014
Total Penetration = 8.0 ft.

Point located at State Plane Coordinates:
North: 712549.00
East: 1168613.00

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

241008010014.13 9/26/14 N:\PROJECTS\0241008.010.014-SED.GPJ SEDIMENT LOG

LANDAU ASSOCIATES

Tru Grit
Tacoma, Washington

Log of Sediment Core G-5

Figure
A-13

APPENDIX B

Laboratory Analytical Results

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-38132-1
Client Project/Site: ConAm/Tru Grit

For:
Landau & Associates, Inc.
950 Pacific Avenue, Suite 515
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Authorized for release by:
4/25/2013 11:10:18 AM

Melissa Armstrong
Project Manager I
melissa.armstrong@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Landau & Associates, Inc.
Project/Site: ConAm/Tru Grit

TestAmerica Job ID: 580-38132-1

Job ID: 580-38132-1

Laboratory: TestAmerica Seattle

Narrative

Receipt
The samples were received on 4/18/2013 3:35 PM; the samples arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 4.7° C.

Metals
No analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Definitions/Glossary

Client: Landau & Associates, Inc.
Project/Site: ConAm/Tru Grit

TestAmerica Job ID: 580-38132-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: ConAm/Tru Grit

TestAmerica Job ID: 580-38132-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-38132-1	U-6	Solid	04/18/13 08:05	04/18/13 15:35
580-38132-2	U-3	Solid	04/18/13 08:58	04/18/13 15:35
580-38132-3	U-4	Solid	04/18/13 09:45	04/18/13 15:35
580-38132-4	U-1	Solid	04/18/13 10:30	04/18/13 15:35
580-38132-5	U-5	Solid	04/18/13 11:15	04/18/13 15:35
580-38132-6	U-2	Solid	04/18/13 12:05	04/18/13 15:35
580-38132-7	Seep-1	Water	04/18/13 14:55	04/18/13 15:35
580-38132-8	Seep-2	Water	04/18/13 15:10	04/18/13 15:35
580-38132-9	Seep-Dup	Water	04/18/13 07:00	04/18/13 15:35

5812K

LANDAU ASSOCIATES

- [x] Seattle/Edmonds (425) 778-0907
- [ ] Tacoma (253) 926-2493
- [ ] Spokane (509) 327-9737
- [ ] Portland (503) 542-1080
- [ ] _____

580-38132 Chain of Custody

Date 4/18/13

Page 1 of 1

Chain-of-Custody Record

Project Name CanAm / Tin Gnit Project No. 0241008

Project Location/Event Tacoma, WA

Sampler's Name Steve Shaw

Project Contact Jennifer Wynkoop

Send Results To Jennifer Wynkoop; Anne Halvorsen

Turnaround Time
- [x] Standard
- [ ] Accelerated
- [ ] _____

Testing Parameters

	Sample I.D.	Date	Time	Matrix	No. of Containers	Metals * (6020)	Dissolved Metals * (6020) MS/MSD	Observations/Comments
1-	U-6	4/18/13	0805	SOIL	1	X	X	
2-	U-3		0858		1	X	X	
3-	U-4		0945		1	X	X	
4-	U-1		1030		1	X	X	
5-	U-5		1115		1	X	X	
6-	U-2		1205		1	X	X	
7-	Seep -1		1455	WATER	3		X X	
8-	Seep - 2		1510		1		X	
9-	Seep - Dup		0700		1		X	

Observations/Comments

- ~~X Allow water samples to settle, collect aliquot from clear portion~~
- X NWTPH-Dx - run acid wash/silica gel cleanup
- ___ run samples standardized to _____ product
- ___ Analyze for EPH if no specific product identified
- VOC/BTEX/VPH (soil):
  - ___ non-preserved
  - ___ preserved w/methanol
  - ___ preserved w/sodium bisulfate
  - ___ Freeze upon receipt
- [x] Dissolved metal water samples field filtered

Other
* Metals: Cu & Zn

IR = 4.7/4.7
w/o - Mod not ok.
w/ - Client okay to

Special Shipment/Handling or Storage Requirements cool + ice

Method of Shipment delivery

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Printed Name STEVEN SHAW	Printed Name	Printed Name	Printed Name
Company CANON ASSOC	Company TA SEA	Company	Company
Date 4/18/13 Time 1535	Date 4/18/13 Time 15:35	Date Time	Date Time

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative Rev 8/03

4/25/2013

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-38132-1

Login Number: 38132
List Number: 1
Creator: Riley, Nicole

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	Thermal preservation not required.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 6020 - Metals (ICP/MS)

Client Sample ID: U-6
Date Collected: 04/18/13 08:05
Date Received: 04/18/13 15:35

Lab Sample ID: 580-38132-1
Matrix: Solid
Percent Solids: 94.6

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	86		0.35	mg/Kg	☼	04/23/13 12:31	04/23/13 16:41	10
Zinc	170		1.8	mg/Kg	☼	04/23/13 12:31	04/23/13 16:41	10

Client Sample ID: U-3
Date Collected: 04/18/13 08:58
Date Received: 04/18/13 15:35

Lab Sample ID: 580-38132-2
Matrix: Solid
Percent Solids: 87.8

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	79		0.37	mg/Kg	☼	04/23/13 12:31	04/23/13 16:45	10
Zinc	180		1.9	mg/Kg	☼	04/23/13 12:31	04/23/13 16:45	10

Client Sample ID: U-4
Date Collected: 04/18/13 09:45
Date Received: 04/18/13 15:35

Lab Sample ID: 580-38132-3
Matrix: Solid
Percent Solids: 90.5

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	34		0.38	mg/Kg	☼	04/23/13 12:31	04/23/13 16:49	10
Zinc	76		1.9	mg/Kg	☼	04/23/13 12:31	04/23/13 16:49	10

Client Sample ID: U-1
Date Collected: 04/18/13 10:30
Date Received: 04/18/13 15:35

Lab Sample ID: 580-38132-4
Matrix: Solid
Percent Solids: 83.0

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	110		0.42	mg/Kg	☼	04/23/13 12:31	04/23/13 16:53	10
Zinc	310		2.1	mg/Kg	☼	04/23/13 12:31	04/23/13 16:53	10

Client Sample ID: U-5
Date Collected: 04/18/13 11:15
Date Received: 04/18/13 15:35

Lab Sample ID: 580-38132-5
Matrix: Solid
Percent Solids: 91.0

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	120		0.39	mg/Kg	☼	04/23/13 12:31	04/23/13 16:57	10
Zinc	230		2.0	mg/Kg	☼	04/23/13 12:31	04/23/13 16:57	10

Client Sample ID: U-2
Date Collected: 04/18/13 12:05
Date Received: 04/18/13 15:35

Lab Sample ID: 580-38132-6
Matrix: Solid
Percent Solids: 90.5

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	63		0.32	mg/Kg	☼	04/23/13 12:31	04/23/13 17:01	10
Zinc	130		1.6	mg/Kg	☼	04/23/13 12:31	04/23/13 17:01	10

Method: 6020 - Metals (ICP/MS) - Dissolved

Client Sample ID: Seep-1
Date Collected: 04/18/13 14:55
Date Received: 04/18/13 15:35

Lab Sample ID: 580-38132-7
Matrix: Water

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	0.0012	J	0.0050	mg/L		04/23/13 15:47	04/24/13 09:21	5
Zinc	ND		0.0070	mg/L		04/23/13 15:47	04/24/13 09:21	5

Client Sample ID: Seep-2
Date Collected: 04/18/13 15:10
Date Received: 04/18/13 15:35

Lab Sample ID: 580-38132-8
Matrix: Water

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	0.0095		0.0050	mg/L		04/23/13 15:47	04/24/13 09:37	5
Zinc	0.0049	J	0.0070	mg/L		04/23/13 15:47	04/24/13 09:37	5

Client Sample ID: Seep-Dup
Date Collected: 04/18/13 07:00
Date Received: 04/18/13 15:35

Lab Sample ID: 580-38132-9
Matrix: Water

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	0.0096		0.0050	mg/L		04/23/13 15:47	04/24/13 09:41	5
Zinc	0.0049	J	0.0070	mg/L		04/23/13 15:47	04/24/13 09:41	5

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 580-134292/19-A
Matrix: Solid
Analysis Batch: 134343

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 134292

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.40	mg/Kg		04/23/13 12:31	04/23/13 15:10	10
Zinc	ND		2.0	mg/Kg		04/23/13 12:31	04/23/13 15:10	10

Lab Sample ID: LCS 580-134292/20-A
Matrix: Solid
Analysis Batch: 134343

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 134292

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	25.0	26.2		mg/Kg		105	80 - 120
Zinc	50.0	50.0		mg/Kg		100	80 - 120

Lab Sample ID: LCSD 580-134292/21-A
Matrix: Solid
Analysis Batch: 134343

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 134292

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper	25.0	25.3		mg/Kg		101	80 - 120	4	20
Zinc	50.0	50.0		mg/Kg		100	80 - 120	0	20

Lab Sample ID: LCSSRM 580-134292/22-A
Matrix: Solid
Analysis Batch: 134343

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 134292

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	123	128		mg/Kg		104.1	75.0 - 125.2
Zinc	183	190		mg/Kg		103.7	69.4 - 130.6

Lab Sample ID: MB 580-134317/13-A
Matrix: Water
Analysis Batch: 134363

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 134317

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.0050	mg/L		04/23/13 15:47	04/24/13 08:33	5
Zinc	ND		0.0070	mg/L		04/23/13 15:47	04/24/13 08:33	5

Lab Sample ID: LCS 580-134317/14-A
Matrix: Water
Analysis Batch: 134363

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 134317

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	0.500	0.505		mg/L		101	80 - 120
Zinc	1.00	0.968		mg/L		97	80 - 120

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-134317/15-A
Matrix: Water
Analysis Batch: 134363

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 134317

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper	0.500	0.506		mg/L		101	80 - 120	0	20
Zinc	1.00	0.983		mg/L		98	80 - 120	2	20

Lab Sample ID: LCSSRM 580-134317/16-A
Matrix: Water
Analysis Batch: 134363

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 134317

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	0.500	0.505		mg/L		101	80 - 120
Zinc	1.00	0.977		mg/L		98	80 - 120

Lab Sample ID: 580-38132-7 MS
Matrix: Water
Analysis Batch: 134363

Client Sample ID: Seep-1
Prep Type: Dissolved
Prep Batch: 134317

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	0.0012	J	0.500	0.518		mg/L		103	80 - 120
Zinc	ND		1.00	1.04		mg/L		104	80 - 120

Lab Sample ID: 580-38132-7 MSD
Matrix: Water
Analysis Batch: 134363

Client Sample ID: Seep-1
Prep Type: Dissolved
Prep Batch: 134317

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper	0.0012	J	0.500	0.521		mg/L		104	80 - 120	1	20
Zinc	ND		1.00	1.03		mg/L		103	80 - 120	1	20

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: ConAm/Tru Grit

TestAmerica Job ID: 580-38132-1

Client Sample ID: U-6

Lab Sample ID: 580-38132-1
Date Collected: 04/18/13 08:05
Matrix: Solid
Date Received: 04/18/13 15:35
Percent Solids: 94.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			134292	04/23/13 12:31	PAB	TAL SEA
Total/NA	Analysis	6020		10	134343	04/23/13 16:41	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	134338	04/23/13 16:23	PAB	TAL SEA

Client Sample ID: U-3

Lab Sample ID: 580-38132-2
Date Collected: 04/18/13 08:58
Matrix: Solid
Date Received: 04/18/13 15:35
Percent Solids: 87.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			134292	04/23/13 12:31	PAB	TAL SEA
Total/NA	Analysis	6020		10	134343	04/23/13 16:45	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	134338	04/23/13 16:23	PAB	TAL SEA

Client Sample ID: U-4

Lab Sample ID: 580-38132-3
Date Collected: 04/18/13 09:45
Matrix: Solid
Date Received: 04/18/13 15:35
Percent Solids: 90.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			134292	04/23/13 12:31	PAB	TAL SEA
Total/NA	Analysis	6020		10	134343	04/23/13 16:49	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	134338	04/23/13 16:23	PAB	TAL SEA

Client Sample ID: U-1

Lab Sample ID: 580-38132-4
Date Collected: 04/18/13 10:30
Matrix: Solid
Date Received: 04/18/13 15:35
Percent Solids: 83.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			134292	04/23/13 12:31	PAB	TAL SEA
Total/NA	Analysis	6020		10	134343	04/23/13 16:53	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	134338	04/23/13 16:23	PAB	TAL SEA

Client Sample ID: U-5

Lab Sample ID: 580-38132-5
Date Collected: 04/18/13 11:15
Matrix: Solid
Date Received: 04/18/13 15:35
Percent Solids: 91.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			134292	04/23/13 12:31	PAB	TAL SEA
Total/NA	Analysis	6020		10	134343	04/23/13 16:57	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	134338	04/23/13 16:23	PAB	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: ConAm/Tru Grit

TestAmerica Job ID: 580-38132-1

Client Sample ID: U-2

Lab Sample ID: 580-38132-6
Matrix: Solid
Percent Solids: 90.5

Date Collected: 04/18/13 12:05
Date Received: 04/18/13 15:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			134292	04/23/13 12:31	PAB	TAL SEA
Total/NA	Analysis	6020		10	134343	04/23/13 17:01	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	134338	04/23/13 16:23	PAB	TAL SEA

Client Sample ID: Seep-1

Lab Sample ID: 580-38132-7
Matrix: Water

Date Collected: 04/18/13 14:55
Date Received: 04/18/13 15:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			134317	04/23/13 15:47	PAB	TAL SEA
Dissolved	Analysis	6020		5	134363	04/24/13 09:21	FCW	TAL SEA

Client Sample ID: Seep-2

Lab Sample ID: 580-38132-8
Matrix: Water

Date Collected: 04/18/13 15:10
Date Received: 04/18/13 15:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			134317	04/23/13 15:47	PAB	TAL SEA
Dissolved	Analysis	6020		5	134363	04/24/13 09:37	FCW	TAL SEA

Client Sample ID: Seep-Dup

Lab Sample ID: 580-38132-9
Matrix: Water

Date Collected: 04/18/13 07:00
Date Received: 04/18/13 15:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			134317	04/23/13 15:47	PAB	TAL SEA
Dissolved	Analysis	6020		5	134363	04/24/13 09:41	FCW	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Certification Summary

Client: Landau & Associates, Inc.
Project/Site: ConAm/Tru Grit

TestAmerica Job ID: 580-38132-1

Laboratory: TestAmerica Seattle

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-04-14
California	NELAP	9	01115CA	01-31-14
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-06-13
USDA	Federal		P330-11-00222	05-20-14
Washington	State Program	10	C553	02-17-14

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-41982-1
Client Project/Site: TruGrit

For:
Landau & Associates, Inc.
950 Pacific Avenue, Suite 515
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Authorized for release by:
1/30/2014 10:17:18 AM

Melissa Armstrong, Project Manager I
(253)922-2310 x135
melissa.armstrong@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-41982-1

Job ID: 580-41982-1

Laboratory: TestAmerica Seattle

Narrative

Receipt
The samples were received on 1/15/2014 1:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 4.2° C.

Metals
No analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-41982-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-41982-1	SG-05	Solid	01/14/14 10:00	01/15/14 13:15
580-41982-2	SG-06	Solid	01/14/14 10:24	01/15/14 13:15
580-41982-3	SG-07	Solid	01/14/14 10:56	01/15/14 13:15
580-41982-4	SG-09	Solid	01/14/14 11:13	01/15/14 13:15
580-41982-5	SG-08	Solid	01/14/14 12:14	01/15/14 13:15
580-41982-6	SG-11	Solid	01/14/14 12:34	01/15/14 13:15
580-41982-7	SG-12	Solid	01/14/14 13:04	01/15/14 13:15
580-41982-8	SG-19	Solid	01/14/14 13:29	01/15/14 13:15
580-41982-9	SG-16	Solid	01/14/14 13:52	01/15/14 13:15
580-41982-10	BSG-1	Solid	01/14/14 14:22	01/15/14 13:15
580-41982-11	SG-22	Solid	01/14/14 14:51	01/15/14 13:15
580-41982-12	SG-17	Solid	01/14/14 15:41	01/15/14 13:15

☐ Seattle/Edmonds (425) 778-0907
☒ Tacoma (253) 926-2493
☐ Spokane (509) 327-9737
☐ Portland (503) 542-1080
☐ _____

LANDAU ASSOCIATES

Chain-of-Custody Record

Date 1/14/14
Page 1 of 1

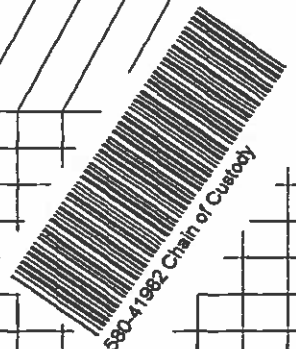
1/30/2014

Project Name Tru Grit Project No. 0241008.010.014
Project Location/Event Tacoma, WA
Sampler's Name Steve Shaw & Brittany Gordon
Project Contact Jennifer Wynkoop
Send Results To Jennifer Wynkoop, Jeffrey Fellows, Anne Hobson Steve Shaw,

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

41982

	Sample I.D.	Date	Time	Matrix	No. of Containers	Testing Parameters: Arsenic, Copper, Zinc	Observations/Comments
-1	SG-05	1/14/14	1000	Sediment	2	X	
-2	SG-06		1024			X	
-3	SG-07		1056			X	
-4	SG-09		1113			X	
-5	SG-08		1214			X	
-6	SG-11		1234			X	
-7	SG-12		1304			X	
-8	SG-19		1329			X	
-9	SG-16		1352			X	
-10	BSG-1		1422			X	
-11	SG-22		1451			X	
-12	SG-17		1514			X	



X Allow water samples to settle, collect aliquot from clear portion
X NWTPH-Dx - run acid wash/silica gel cleanup
___ run samples standardized to _____ product
___ Analyze for EPH if no specific product identified
VOC/BTEX/VPH (soil):
___ non-preserved
___ preserved w/methanol
___ preserved w/sodium bisulfate
___ Freeze upon receipt
___ Dissolved metal water samples field filtered
Other 4 oz 4 oz 4 oz
LG GR BLU
ICE NONE
W/CS LAB COURIER
13:45

Special Shipment/Handling or Storage Requirements: cool + ice
Method of Shipment: pickup @ office

Relinquished by	Received by	Relinquished by	Received by
Signature: Brittany Gordon	Signature: R.T. McDaniel	Signature	Signature
Printed Name: Brittany Gordon	Printed Name: R.T. McDaniel	Printed Name	Printed Name
Company: LAI	Company: TA SEA	Company	Company
Date: 1/14/2014 Time: 1635	Date: 1-15-14 Time: 13:15	Date _____ Time _____	Date _____ Time _____

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative Rev 8/09

☐ Seattle/Edmonds (425) 778-0907
☒ Tacoma (253) 926-2493
☐ Spokane (509) 327-9737
☐ Portland (503) 542-1080
☐ _____

LANDAU ASSOCIATES

Chain-of-Custody Record

Date 1/14/14
Page 1 of 1

1/30/2014

Project Name Tru Grit Project No. 0241008.010.014
Project Location/Event Tacoma, WA
Sampler's Name Steve Shaw & Brittany Gordon
Project Contact Jennifer Wynkoop
Send Results To Jennifer Wynkoop, Jeffrey Fellows, Anne Hobson Steve Shaw,

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

41982

	Sample I.D.	Date	Time	Matrix	No. of Containers	Testing Parameters: Arsenic, Copper, Zinc	Observations/Comments
-1	SG-05	1/14/14	1000	Sediment	2	X	
-2	SG-06		1024			X	
-3	SG-07		1056			X	
-4	SG-09		1113			X	
-5	SG-08		1214			X	
-6	SG-11		1234			X	
-7	SG-12		1304			X	
-8	SG-19		1329			X	
-9	SG-16		1352			X	
-10	BSG-1		1422			X	
-11	SG-22		1451			X	
-12	SG-17		1514			X	

580-41982 Chain of Custody

X Allow water samples to settle, collect aliquot from clear portion
X NWTPH-Dx - run acid wash/silica gel cleanup
___ run samples standardized to _____ product
___ Analyze for EPH if no specific product identified
VOC/BTEX/VPH (soil):
___ non-preserved
___ preserved w/methanol
___ preserved w/sodium bisulfate
___ Freeze upon receipt
___ Dissolved metal water samples field filtered
Other AZ 4oz 4oz LG GR BLU ICE NONE WICS LAB COURIER 13:45

Special Shipment/Handling or Storage Requirements cooler + ice
Method of Shipment pickup @ office

Relinquished by	Received by	Relinquished by	Received by
Signature: Brittany Gordon	Signature:	Signature:	Signature:
Printed Name: Brittany Gordon	Printed Name: R. T. McDANIEL	Printed Name:	Printed Name:
Company: LAI	Company: TA SEA	Company:	Company:
Date: 1/14/2014 Time: 1635	Date: 1-15-14 Time: 13:15	Date: Time:	Date: Time:

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative Rev 8/09

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-41982-1

Login Number: 41982
List Number: 1
Creator: Blankinship, Tom X

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 6020 - Metals (ICP/MS)

Client Sample ID: SG-05
Date Collected: 01/14/14 10:00
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-1
Matrix: Solid
Percent Solids: 75.5

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.2		0.55	mg/Kg	☼	01/24/14 12:56	01/28/14 11:26	10
Copper	36		0.44	mg/Kg	☼	01/24/14 12:56	01/28/14 11:26	10
Zinc	120		2.2	mg/Kg	☼	01/24/14 12:56	01/28/14 11:26	10

Client Sample ID: SG-06
Date Collected: 01/14/14 10:24
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-2
Matrix: Solid
Percent Solids: 74.7

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.4		0.46	mg/Kg	☼	01/24/14 12:56	01/28/14 11:36	10
Copper	20		0.37	mg/Kg	☼	01/24/14 12:56	01/28/14 11:36	10
Zinc	32		1.8	mg/Kg	☼	01/24/14 12:56	01/28/14 11:36	10

Client Sample ID: SG-07
Date Collected: 01/14/14 10:56
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-3
Matrix: Solid
Percent Solids: 76.1

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	21		0.43	mg/Kg	☼	01/24/14 12:56	01/28/14 11:50	10
Copper	76		0.35	mg/Kg	☼	01/24/14 12:56	01/28/14 11:50	10
Zinc	130		1.7	mg/Kg	☼	01/24/14 12:56	01/28/14 11:50	10

Client Sample ID: SG-09
Date Collected: 01/14/14 11:13
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-4
Matrix: Solid
Percent Solids: 77.3

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	17		0.46	mg/Kg	☼	01/24/14 12:56	01/28/14 11:55	10
Copper	58		0.37	mg/Kg	☼	01/24/14 12:56	01/28/14 11:55	10
Zinc	110		1.8	mg/Kg	☼	01/24/14 12:56	01/28/14 11:55	10

Client Sample ID: SG-08
Date Collected: 01/14/14 12:14
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-5
Matrix: Solid
Percent Solids: 76.5

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.5		0.41	mg/Kg	☼	01/24/14 12:56	01/28/14 12:00	10
Copper	24		0.33	mg/Kg	☼	01/24/14 12:56	01/28/14 12:00	10
Zinc	42		1.6	mg/Kg	☼	01/24/14 12:56	01/28/14 12:00	10

Client Sample ID: SG-11
Date Collected: 01/14/14 12:34
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-6
Matrix: Solid
Percent Solids: 62.0

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	16		0.78	mg/Kg	☼	01/24/14 12:56	01/28/14 12:05	10
Copper	45		0.62	mg/Kg	☼	01/24/14 12:56	01/28/14 12:05	10
Zinc	84		3.1	mg/Kg	☼	01/24/14 12:56	01/28/14 12:05	10

Client Sample ID: SG-12
Date Collected: 01/14/14 13:04
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-7
Matrix: Solid
Percent Solids: 63.1

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	38		0.67	mg/Kg	☼	01/24/14 12:56	01/28/14 12:09	10
Copper	180		0.54	mg/Kg	☼	01/24/14 12:56	01/28/14 12:09	10
Zinc	450		2.7	mg/Kg	☼	01/24/14 12:56	01/28/14 12:09	10

Method: 6020 - Metals (ICP/MS)

Client Sample ID: SG-19
Date Collected: 01/14/14 13:29
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-8
Matrix: Solid
Percent Solids: 58.5

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.4		0.66	mg/Kg	☼	01/24/14 12:56	01/28/14 12:14	10
Copper	46		0.53	mg/Kg	☼	01/24/14 12:56	01/28/14 12:14	10
Zinc	74		2.6	mg/Kg	☼	01/24/14 12:56	01/28/14 12:14	10

Client Sample ID: SG-16
Date Collected: 01/14/14 13:52
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-9
Matrix: Solid
Percent Solids: 63.7

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	11		0.62	mg/Kg	☼	01/24/14 12:56	01/28/14 12:19	10
Copper	360		0.49	mg/Kg	☼	01/24/14 12:56	01/28/14 12:19	10
Zinc	1200		2.5	mg/Kg	☼	01/24/14 12:56	01/28/14 12:19	10

Client Sample ID: BSG-1
Date Collected: 01/14/14 14:22
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-10
Matrix: Solid
Percent Solids: 66.8

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.7		0.63	mg/Kg	☼	01/24/14 12:56	01/28/14 12:24	10
Copper	31		0.51	mg/Kg	☼	01/24/14 12:56	01/28/14 12:24	10
Zinc	56		2.5	mg/Kg	☼	01/24/14 12:56	01/28/14 12:24	10

Client Sample ID: SG-22
Date Collected: 01/14/14 14:51
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-11
Matrix: Solid
Percent Solids: 61.1

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.2		0.65	mg/Kg	☼	01/24/14 12:56	01/28/14 12:28	10
Copper	34		0.52	mg/Kg	☼	01/24/14 12:56	01/28/14 12:28	10
Zinc	52		2.6	mg/Kg	☼	01/24/14 12:56	01/28/14 12:28	10

Client Sample ID: SG-17
Date Collected: 01/14/14 15:41
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-12
Matrix: Solid
Percent Solids: 66.8

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	31		0.70	mg/Kg	☼	01/24/14 12:56	01/28/14 12:33	10
Copper	550		0.56	mg/Kg	☼	01/24/14 12:56	01/28/14 12:33	10
Zinc	1700		2.8	mg/Kg	☼	01/24/14 12:56	01/28/14 12:33	10

General Chemistry

Client Sample ID: SG-05
Date Collected: 01/14/14 10:00
Date Received: 01/15/14 13:15
Lab Sample ID: 580-41982-1
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	75		0.10	%			01/20/14 13:50	1

Client Sample ID: SG-06
Date Collected: 01/14/14 10:24
Date Received: 01/15/14 13:15
Lab Sample ID: 580-41982-2
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	75		0.10	%			01/20/14 13:50	1

Client Sample ID: SG-07
Date Collected: 01/14/14 10:56
Date Received: 01/15/14 13:15
Lab Sample ID: 580-41982-3
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	76		0.10	%			01/20/14 13:50	1

Client Sample ID: SG-09
Date Collected: 01/14/14 11:13
Date Received: 01/15/14 13:15
Lab Sample ID: 580-41982-4
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	77		0.10	%			01/20/14 13:50	1

Client Sample ID: SG-08
Date Collected: 01/14/14 12:14
Date Received: 01/15/14 13:15
Lab Sample ID: 580-41982-5
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	77		0.10	%			01/20/14 13:50	1

Client Sample ID: SG-11
Date Collected: 01/14/14 12:34
Date Received: 01/15/14 13:15
Lab Sample ID: 580-41982-6
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	62		0.10	%			01/20/14 13:50	1

Client Sample ID: SG-12
Date Collected: 01/14/14 13:04
Date Received: 01/15/14 13:15
Lab Sample ID: 580-41982-7
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	63		0.10	%			01/20/14 13:50	1

Client Sample ID: SG-19
Date Collected: 01/14/14 13:29
Date Received: 01/15/14 13:15
Lab Sample ID: 580-41982-8
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	59		0.10	%			01/20/14 13:50	1

Client Sample ID: SG-16
Date Collected: 01/14/14 13:52
Date Received: 01/15/14 13:15
Lab Sample ID: 580-41982-9
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	64		0.10	%			01/20/14 13:50	1

General Chemistry

Client Sample ID: BSG-1
Date Collected: 01/14/14 14:22
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-10
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	67		0.10	%			01/20/14 13:50	1

Client Sample ID: SG-22
Date Collected: 01/14/14 14:51
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-11
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	61		0.10	%			01/20/14 13:50	1

Client Sample ID: SG-17
Date Collected: 01/14/14 15:41
Date Received: 01/15/14 13:15

Lab Sample ID: 580-41982-12
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Solids	67		0.10	%			01/20/14 13:50	1

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 580-152640/20-A
Matrix: Solid
Analysis Batch: 152796

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 152640

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	mg/Kg		01/24/14 12:56	01/28/14 10:19	10
Copper	ND		0.40	mg/Kg		01/24/14 12:56	01/28/14 10:19	10
Zinc	ND		2.0	mg/Kg		01/24/14 12:56	01/28/14 10:19	10

Lab Sample ID: LCS 580-152640/21-A
Matrix: Solid
Analysis Batch: 152796

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 152640

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	192		mg/Kg		96	80 - 120
Copper	25.0	24.7		mg/Kg		99	80 - 120
Zinc	50.0	50.7		mg/Kg		101	80 - 120

Lab Sample ID: LCSD 580-152640/22-A
Matrix: Solid
Analysis Batch: 152796

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 152640

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	192		mg/Kg		96	80 - 120	0	20
Copper	25.0	24.4		mg/Kg		98	80 - 120	1	20
Zinc	50.0	49.8		mg/Kg		100	80 - 120	2	20

Lab Sample ID: LCSSRM 580-152640/23-A
Matrix: Solid
Analysis Batch: 152796

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 152640

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	237	245		mg/Kg		103.4	71.3 - 129.1
Copper	123	125		mg/Kg		101.6	75.0 - 125.2
Zinc	183	189		mg/Kg		103.5	69.4 - 130.6

Lab Sample ID: 580-41982-1 DU
Matrix: Solid
Analysis Batch: 152796

Client Sample ID: SG-05
Prep Type: Total/NA
Prep Batch: 152640

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	6.2		6.13		mg/Kg	☼	0.8	20
Copper	36		36.5		mg/Kg	☼	0.8	20
Zinc	120		122		mg/Kg	☼	0.3	20

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-41982-1

Client Sample ID: SG-05

Lab Sample ID: 580-41982-1

Date Collected: 01/14/14 10:00
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 75.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 11:26	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Client Sample ID: SG-06

Lab Sample ID: 580-41982-2

Date Collected: 01/14/14 10:24
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 74.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 11:36	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Client Sample ID: SG-07

Lab Sample ID: 580-41982-3

Date Collected: 01/14/14 10:56
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 76.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 11:50	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Client Sample ID: SG-09

Lab Sample ID: 580-41982-4

Date Collected: 01/14/14 11:13
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 77.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 11:55	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Client Sample ID: SG-08

Lab Sample ID: 580-41982-5

Date Collected: 01/14/14 12:14
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 76.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 12:00	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-41982-1

Client Sample ID: SG-11

Lab Sample ID: 580-41982-6
Date Collected: 01/14/14 12:34
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 62.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 12:05	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Client Sample ID: SG-12

Lab Sample ID: 580-41982-7
Date Collected: 01/14/14 13:04
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 63.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 12:09	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Client Sample ID: SG-19

Lab Sample ID: 580-41982-8
Date Collected: 01/14/14 13:29
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 58.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 12:14	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Client Sample ID: SG-16

Lab Sample ID: 580-41982-9
Date Collected: 01/14/14 13:52
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 63.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 12:19	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Client Sample ID: BSG-1

Lab Sample ID: 580-41982-10
Date Collected: 01/14/14 14:22
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 66.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 12:24	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-41982-1

Client Sample ID: SG-22

Lab Sample ID: 580-41982-11

Date Collected: 01/14/14 14:51
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 61.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 12:28	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Client Sample ID: SG-17

Lab Sample ID: 580-41982-12

Date Collected: 01/14/14 15:41
Matrix: Solid
Date Received: 01/15/14 13:15
Percent Solids: 66.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152640	01/24/14 12:56	PAB	TAL SEA
Total/NA	Analysis	6020		10	152796	01/28/14 12:33	FCW	TAL SEA
Total/NA	Analysis	160.3		1	152324	01/20/14 13:50	RBD	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Certification Summary

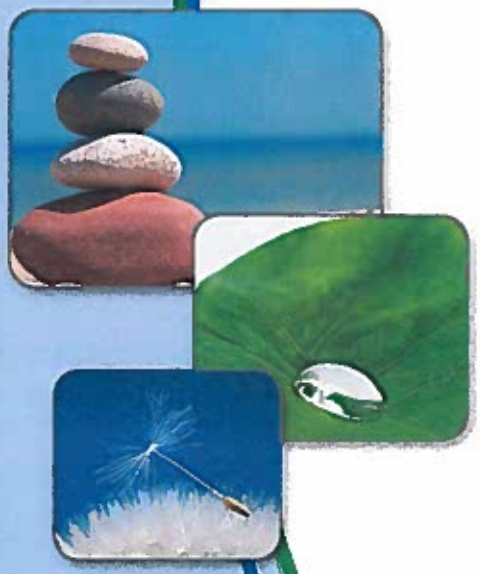
Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-41982-1

Laboratory: TestAmerica Seattle

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C553	02-17-14



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-41997-1
Client Project/Site: Can Am/Tru Grit
Revision: 1

For:
Landau & Associates, Inc.
950 Pacific Avenue, Suite 515
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Authorized for release by:
2/7/2014 4:33:32 PM

Melissa Armstrong, Project Manager I
(253)922-2310 x135
melissa.armstrong@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Landau & Associates, Inc
Project/Site: Can Am/Tru Grit

TestAmerica Job ID: 580-41997-1

Job ID: 580-41997-1

Laboratory: TestAmerica Seattle

Narrative

Revised 2/7/14 - Narration for method 3550B was left off the original report.

Receipt
The samples were received on 1/16/2014 5:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.5° C.

The metals analysis for samples SG-10 (580-41997-11) and SG-13 (580-41997-13) were logged in for the SMS metals instead of the Arsenic, Copper and Zinc listed on the original Chain-of-Custody. A revised COC was received and confirmed the correct analytes.

GC/MS Semi VOA - Method(s) 8270C
The method blank 580-153105/1-A contained Diethyl phthalate and Phenol above the method detection limit. These target analyte concentrations were less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not warranted. The values should be considered as estimates, and have been "J" qualified. The associated sample results have been "B" qualified.

No other analytical or quality issues were noted.

GC Semi VOA - Method(s) 8082
The matrix spike/ matrix spike duplicate (MS/MSD) precision for analysis batch 152994 was outside control limits for PCB-1260. Non-homogeneity is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. Affected data has been qualified and reported.

No analytical or quality issues were noted.

Metals - Method(s) 6020
The matrix spike (MS) recovery for analysis batch 152822 was outside lower control limits for Zinc. Non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. Affected data has been qualified and reported.

No other analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Geotechnical
No analytical or quality issues were noted.

Organic Prep - Method(s) 3550B
Samples SG-10 (580-41997-11) and SG-13 (580-41997-13) were placed in the freezer upon receipt and prior to expiration, thus extending the holding time to 6 months. These samples were removed from freezer at 12:53 PM on 2/3/14 and allowed to thaw in the walk-in until the following day, at which time they were prepped. As such no holding time violations occurred.

No other analytical or quality issues were noted.

Definitions/Glossary

Client: Landau & Associates, Inc.
Project/Site: Can Am/Tru Grit

TestAmerica Job ID: 580-41997-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

GC Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F2	MS/MSD RPD exceeds control limits

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F1	MS and/or MSD Recovery exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: Can Am/Tru Grit

TestAmerica Job ID: 580-41997-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-41997-1	SG-01	Solid	01/14/14 20:59	01/16/14 15:59
580-41997-2	SG-02	Solid	01/14/14 21:03	01/16/14 15:59
580-41997-3	SG-24	Solid	01/14/14 21:09	01/16/14 15:59
580-41997-4	SG-03	Solid	01/14/14 21:13	01/16/14 15:59
580-41997-5	SG-04	Solid	01/14/14 21:20	01/16/14 15:59
580-41997-6	SG-23	Solid	01/14/14 21:22	01/16/14 15:59
580-41997-7	SG-15	Solid	01/15/14 08:54	01/16/14 15:59
580-41997-8	SG-21	Solid	01/15/14 09:27	01/16/14 15:59
580-41997-9	SG-20	Solid	01/15/14 09:48	01/16/14 15:59
580-41997-10	SG-DUP	Solid	01/15/14 08:40	01/16/14 15:59
580-41997-11	SG-10	Solid	01/15/14 10:05	01/16/14 15:59
580-41997-12	BSG-2	Solid	01/15/14 10:45	01/16/14 15:59
580-41997-13	SG-13	Solid	01/15/14 11:08	01/16/14 15:59
580-41997-14	SG-14	Solid	01/15/14 11:41	01/16/14 15:59
580-41997-15	SG-18	Solid	01/15/14 11:58	01/16/14 15:59

41997

☐ Seattle/Edmonds (425) 778-0907
☒ Tacoma (253) 926-2493
☐ Spokane (509) 327-9737
☐ Portland (503) 542-1080
☐ _____

LANDAU ASSOCIATES

Chain-of-Custody Record

Date 1/15/14
Page 1 of 1

Project Name Con Am / Tac Grit Project No. 0241008.010.014
Project Location/Event Tacoma, WA
Sampler's Name Steve Shaw & Brittany Gordon
Project Contact Jennifer Vynkoop
Send Results To Jennifer Vynkoop, Jeffrey Fulton, Anne Helgeson, Steve Shaw

Testing Parameters

Sample I.D.	Date	Time	Matrix	No. of Containers	Arsenic, Copper, Zinc Archive*	TOC	SVOCs (8270)	PCBs (8082)	Grain Size	MS/MSD for metals
SG-01	1/14/14	2059	Sediment	2	X	X				
SG-02		2103		2	X	X				
SG-24		2109		2	X	X				
SG-03		2113		2	X	X				
SG-04		2120		2	X	X				
SG-23		2122		2	X	X				
SG-15	1/15/14	0854	Sediment	2	X	X				
SG-21		0927		2	X	X				
SG-20		0948		2	X	X				
SG-Dup		0840		2	X	X				
SG-10		1005		7	X	X	X	X	X	X
BSG-2		1045		2	X	X				
SG-13		1108		5	X	X	X	X	X	
SG-14		1142		2	X	X				
SG-18		1158		2	X	X				

580-41997 Chain of Custody

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Observations/Comments
X Allow water samples to settle, collect aliquot from clear portion
X NWTPH-Dx - run acid wash/silica gel cleanup
___ run samples standardized to _____ product
___ Analyze for EPH if no specific product identified
VOC/BTEX/VPH (soil):
___ non-preserved
___ preserved w/methanol
___ preserved w/sodium bisulfate
___ Freeze upon receipt
___ Dissolved metal water samples field filtered
Other *Jars for archiving are marked with an asterisk on the lid

Special Shipment/Handling or Storage Requirements: cooler w ice
Method of Shipment: pickup

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Steven D Shaw	Sierra Mott	Sierra Mott	R.L. McDaniel
Printed Name	Printed Name	Printed Name	Printed Name
Landau Associates	Landau Associates	Landau Associate	TASEA
Company	Company	Company	Company
Date 1/15/14 Time 1400	Date 1/16/14 Time 1740	Date 1/16/14 Time 1740	Date 1-16-14 Time 17:40

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

ICE NONE IR 5.5 5.9

Rev 8/08

2/7/2014

41997

LANDAU ASSOCIATES

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☒ Tacoma (253) 926-2493
☐ Spokane (509) 327-9737
☐ Portland (503) 542-1080
☐ _____

Chain-of-Custody Record

Date 1/15/14
Page 1 of 1

Project Name Con Am / Tar Grit Project No. 041008.010.014
Project Location/Event Tacoma, WA
Sampler's Name Steve Shaw & Brittany Gordon
Project Contact Jennifer Wynkoop
Send Results To Jennifer Wynkoop, Jeffrey Fellows, Anne Helvoigt, Steve Shaw

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Sample I.D.	Date	Time	Matrix	No. of Containers	Arsenic, Copper, Zinc Archive*	TOC	SVOCs (8270)	PCBs (8082)	Grain Size	MS/MSD RCRA metals	SMS metals list	added 1/16/14 SDS	Observations/Comments
SG-01	1/14/14	2059	Sediment	2	X	X							
SG-02		2103		2	X	X							
SG-24		2109		2	X	X							
SG-03		2113		2	X	X							
SG-04		2120		2	X	X							
SG-23		2122		2	X	X							
SG-15	1/15/14	0854	Sediment	2	X	X							
SG-21		0927		2	X	X							
SG-20		0948		2	X	X							
SG-Dup		0840		2	X	X							
SG-10		1005		7	X	X	X	X	X	X	X	added 1/16/14 SDS	
BSG-2		1045		2	X	X							
SG-13		1108		5	X	X	X	X	X	X			
SG-14		1142		2	X	X							
SG-18		1158		2	X	X							

Testing Parameters

580-41997 Chain of Custody

Observations/Comments

- X Allow water samples to settle, collect aliquot from clear portion
- X NWTPH-Dx - run acid wash/silica gel cleanup
- ___ run samples standardized to _____ product
- ___ Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
- ___ non-preserved
- ___ preserved w/methanol
- ___ preserved w/sodium bisulfate
- ___ Freeze upon receipt

- ___ Dissolved metal water samples field filtered

Other *Jars for archiving are marked with an asterisk on the lid

Special Shipment/Handling or Storage Requirements Cooler & Ice

Method of Shipment pickup

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Printed Name SIGLIN D. SHAW	Printed Name Sierra Mott	Printed Name Sierra Mott	Printed Name R.L. McDaniel
Company Landau Associates	Company Landau Associates	Company Landau Associate	Company TASEA
Date 1/15/14 Time 1400	Date 1/16/14 Time 1740	Date 1/16/14 Time 1740	Date 1-16-14 Time 17:40

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

@ Ambient ICE NONE IR - 5.5 5.9

Rev 8/09

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-41997-1

Login Number: 41997
List Number: 1
Creator: McDaniel, Ronald T

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Client Sample ID: SG-10
Date Collected: 01/15/14 10:05
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-11
Matrix: Solid
Percent Solids: 74.5

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		16	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
1,2-Dichlorobenzene	ND		18	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
1,4-Dichlorobenzene	ND		16	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
2,4-Dimethylphenol	ND		32	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
2-Methylnaphthalene	2.8	J	6.4	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
2-Methylphenol	ND		32	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
3 & 4 Methylphenol	ND		64	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Acenaphthene	8.0		6.4	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Acenaphthylene	7.3		6.4	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Anthracene	32		6.4	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Benzo[a]anthracene	99		6.4	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Benzo[a]pyrene	90		9.6	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Benzo[g,h,i]perylene	43		8.0	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Benzofluoranthene	190		13	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Benzoic acid	ND		800	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Benzyl alcohol	ND		32	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Bis(2-ethylhexyl) phthalate	41	J	190	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Butyl benzyl phthalate	18	J	64	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Chrysene	180		8.0	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Dibenz(a,h)anthracene	16		13	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Dibenzofuran	5.5	J	32	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Diethyl phthalate	ND		64	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Dimethyl phthalate	ND		32	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Di-n-butyl phthalate	ND		160	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Di-n-octyl phthalate	ND		160	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Fluoranthene	210		6.4	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Fluorene	12		6.4	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Hexachlorobenzene	ND		16	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Hexachlorobutadiene	ND		16	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Indeno[1,2,3-cd]pyrene	58		13	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Naphthalene	4.1	J	6.4	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
N-Nitrosodiphenylamine	ND		16	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Pentachlorophenol	33	J	64	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Phenanthrene	97		6.4	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Phenol	5.1	J B	32	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10
Pyrene	250		6.4	ug/Kg	☼	02/04/14 08:33	02/04/14 19:38	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*97*		*28 - 143*	*02/04/14 08:33*	*02/04/14 19:38*	*10*
2-Fluorobiphenyl	*77*		*42 - 140*	*02/04/14 08:33*	*02/04/14 19:38*	*10*
2-Fluorophenol	*80*		*36 - 145*	*02/04/14 08:33*	*02/04/14 19:38*	*10*
Nitrobenzene-d5	*83*		*38 - 141*	*02/04/14 08:33*	*02/04/14 19:38*	*10*
Phenol-d5	*87*		*38 - 149*	*02/04/14 08:33*	*02/04/14 19:38*	*10*
Terphenyl-d14	*90*		*42 - 151*	*02/04/14 08:33*	*02/04/14 19:38*	*10*

Client Sample ID: SG-13
Date Collected: 01/15/14 11:08
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-13
Matrix: Solid
Percent Solids: 54.9

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		65	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: SG-13
Date Collected: 01/15/14 11:08
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-13
Matrix: Solid
Percent Solids: 54.9

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	ND		71	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
1,4-Dichlorobenzene	ND		65	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
2,4-Dimethylphenol	ND		130	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
2-Methylnaphthalene	10	J	26	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
2-Methylphenol	ND		130	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
3 & 4 Methylphenol	ND		260	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Acenaphthene	19	J	26	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Acenaphthylene	19	J	26	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Anthracene	100		26	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Benzo[a]anthracene	240		26	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Benzo[a]pyrene	230		39	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Benzo[g,h,i]perylene	87		32	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Benzofluoranthene	500		52	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Benzoic acid	ND		3200	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Benzyl alcohol	ND		130	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Bis(2-ethylhexyl) phthalate	120	J	780	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Butyl benzyl phthalate	ND		260	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Chrysene	400		32	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Dibenz(a,h)anthracene	32	J	52	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Dibenzofuran	14	J	130	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Diethyl phthalate	ND		260	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Dimethyl phthalate	ND		130	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Di-n-butyl phthalate	ND		650	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Di-n-octyl phthalate	22	J	650	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Fluoranthene	550		26	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Fluorene	28		26	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Hexachlorobenzene	ND		65	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Hexachlorobutadiene	ND		65	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Indeno[1,2,3-cd]pyrene	120		52	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Naphthalene	ND		26	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
N-Nitrosodiphenylamine	ND		65	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Pentachlorophenol	120	J	260	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Phenanthrene	140		26	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Phenol	ND		130	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10
Pyrene	540		26	ug/Kg	☼	02/04/14 08:33	02/04/14 20:39	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*88*		*28 - 143*	*02/04/14 08:33*	*02/04/14 20:39*	*10*
2-Fluorobiphenyl	*74*		*42 - 140*	*02/04/14 08:33*	*02/04/14 20:39*	*10*
2-Fluorophenol	*77*		*36 - 145*	*02/04/14 08:33*	*02/04/14 20:39*	*10*
Nitrobenzene-d5	*72*		*38 - 141*	*02/04/14 08:33*	*02/04/14 20:39*	*10*
Phenol-d5	*86*		*38 - 149*	*02/04/14 08:33*	*02/04/14 20:39*	*10*
Terphenyl-d14	*96*		*42 - 151*	*02/04/14 08:33*	*02/04/14 20:39*	*10*

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Client Sample ID: SG-10
Date Collected: 01/15/14 10:05
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-11
Matrix: Solid
Percent Solids: 74.5

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.013	mg/Kg	☼	01/29/14 11:18	01/31/14 11:59	1
PCB-1221	ND		0.015	mg/Kg	☼	01/29/14 11:18	01/31/14 11:59	1
PCB-1232	ND		0.015	mg/Kg	☼	01/29/14 11:18	01/31/14 11:59	1
PCB-1242	ND		0.013	mg/Kg	☼	01/29/14 11:18	01/31/14 11:59	1
PCB-1248	ND		0.013	mg/Kg	☼	01/29/14 11:18	01/31/14 11:59	1
PCB-1254	ND		0.013	mg/Kg	☼	01/29/14 11:18	01/31/14 11:59	1
PCB-1260	ND		0.013	mg/Kg	☼	01/29/14 11:18	01/31/14 11:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*98*		*45 - 135*	*01/29/14 11:18*	*01/31/14 11:59*	*1*
DCB Decachlorobiphenyl	*91*		*50 - 140*	*01/29/14 11:18*	*01/31/14 11:59*	*1*

Client Sample ID: SG-13
Date Collected: 01/15/14 11:08
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-13
Matrix: Solid
Percent Solids: 54.9

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.017	mg/Kg	☼	01/29/14 11:18	01/31/14 12:13	1
PCB-1221	ND		0.019	mg/Kg	☼	01/29/14 11:18	01/31/14 12:13	1
PCB-1232	ND		0.019	mg/Kg	☼	01/29/14 11:18	01/31/14 12:13	1
PCB-1242	ND		0.017	mg/Kg	☼	01/29/14 11:18	01/31/14 12:13	1
PCB-1248	ND		0.017	mg/Kg	☼	01/29/14 11:18	01/31/14 12:13	1
PCB-1254	ND		0.017	mg/Kg	☼	01/29/14 11:18	01/31/14 12:13	1
PCB-1260	0.015	J	0.017	mg/Kg	☼	01/29/14 11:18	01/31/14 12:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*90*		*45 - 135*	*01/29/14 11:18*	*01/31/14 12:13*	*1*
DCB Decachlorobiphenyl	*88*		*50 - 140*	*01/29/14 11:18*	*01/31/14 12:13*	*1*

Method: 6020 - Metals (ICP/MS)

Client Sample ID: SG-01 — **Lab Sample ID: 580-41997-1**
Date Collected: 01/14/14 20:59 — **Matrix: Solid**
Date Received: 01/16/14 15:59 — **Percent Solids: 67.2**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.7		0.65	mg/Kg	☼	01/24/14 15:26	01/28/14 16:04	10
Copper	52		0.52	mg/Kg	☼	01/24/14 15:26	01/28/14 16:04	10
Zinc	85		2.6	mg/Kg	☼	01/24/14 15:26	01/28/14 16:04	10

Client Sample ID: SG-02 — **Lab Sample ID: 580-41997-2**
Date Collected: 01/14/14 21:03 — **Matrix: Solid**
Date Received: 01/16/14 15:59 — **Percent Solids: 74.7**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.0		0.60	mg/Kg	☼	01/24/14 15:26	01/28/14 16:09	10
Copper	12		0.48	mg/Kg	☼	01/24/14 15:26	01/28/14 16:09	10
Zinc	48		2.4	mg/Kg	☼	01/24/14 15:26	01/28/14 16:09	10

Client Sample ID: SG-24 — **Lab Sample ID: 580-41997-3**
Date Collected: 01/14/14 21:09 — **Matrix: Solid**
Date Received: 01/16/14 15:59 — **Percent Solids: 78.6**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5		0.57	mg/Kg	☼	01/24/14 15:26	01/28/14 16:14	10
Copper	11		0.45	mg/Kg	☼	01/24/14 15:26	01/28/14 16:14	10
Zinc	24		2.3	mg/Kg	☼	01/24/14 15:26	01/28/14 16:14	10

Client Sample ID: SG-03 — **Lab Sample ID: 580-41997-4**
Date Collected: 01/14/14 21:13 — **Matrix: Solid**
Date Received: 01/16/14 15:59 — **Percent Solids: 75.7**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.3		0.42	mg/Kg	☼	01/24/14 15:26	01/28/14 16:19	10
Copper	12		0.34	mg/Kg	☼	01/24/14 15:26	01/28/14 16:19	10
Zinc	36		1.7	mg/Kg	☼	01/24/14 15:26	01/28/14 16:19	10

Client Sample ID: SG-04 — **Lab Sample ID: 580-41997-5**
Date Collected: 01/14/14 21:20 — **Matrix: Solid**
Date Received: 01/16/14 15:59 — **Percent Solids: 75.6**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	66		0.52	mg/Kg	☼	01/24/14 15:26	01/28/14 16:23	10
Copper	160		0.41	mg/Kg	☼	01/24/14 15:26	01/28/14 16:23	10
Zinc	380		2.1	mg/Kg	☼	01/24/14 15:26	01/28/14 16:23	10

Client Sample ID: SG-23 — **Lab Sample ID: 580-41997-6**
Date Collected: 01/14/14 21:22 — **Matrix: Solid**
Date Received: 01/16/14 15:59 — **Percent Solids: 71.0**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	140		0.62	mg/Kg	☼	01/24/14 15:26	01/28/14 16:28	10
Copper	420		0.50	mg/Kg	☼	01/24/14 15:26	01/28/14 16:28	10
Zinc	1200		2.5	mg/Kg	☼	01/24/14 15:26	01/28/14 16:28	10

Client Sample ID: SG-15 — **Lab Sample ID: 580-41997-7**
Date Collected: 01/15/14 08:54 — **Matrix: Solid**
Date Received: 01/16/14 15:59 — **Percent Solids: 63.4**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	38		0.75	mg/Kg	☼	01/24/14 15:26	01/28/14 16:33	10
Copper	250		0.60	mg/Kg	☼	01/24/14 15:26	01/28/14 16:33	10
Zinc	630		3.0	mg/Kg	☼	01/24/14 15:26	01/28/14 16:33	10

Method: 6020 - Metals (ICP/MS)

Client Sample ID: SG-21
Date Collected: 01/15/14 09:27
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-8
Matrix: Solid
Percent Solids: 63.7

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.4		0.60	mg/Kg	☼	01/24/14 15:26	01/28/14 16:38	10
Copper	33		0.48	mg/Kg	☼	01/24/14 15:26	01/28/14 16:38	10
Zinc	56		2.4	mg/Kg	☼	01/24/14 15:26	01/28/14 16:38	10

Client Sample ID: SG-20
Date Collected: 01/15/14 09:48
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-9
Matrix: Solid
Percent Solids: 58.9

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.6		0.64	mg/Kg	☼	01/24/14 15:26	01/28/14 16:42	10
Copper	34		0.52	mg/Kg	☼	01/24/14 15:26	01/28/14 16:42	10
Zinc	79		2.6	mg/Kg	☼	01/24/14 15:26	01/28/14 16:42	10

Client Sample ID: SG-DUP
Date Collected: 01/15/14 08:40
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-10
Matrix: Solid
Percent Solids: 60.7

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.1		0.79	mg/Kg	☼	01/24/14 15:26	01/28/14 16:47	10
Copper	29		0.63	mg/Kg	☼	01/24/14 15:26	01/28/14 16:47	10
Zinc	46		3.2	mg/Kg	☼	01/24/14 15:26	01/28/14 16:47	10

Client Sample ID: SG-10
Date Collected: 01/15/14 10:05
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-11
Matrix: Solid
Percent Solids: 74.5

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.8		0.57	mg/Kg	☼	01/24/14 15:26	01/28/14 14:38	10
Cadmium	0.14	J	0.23	mg/Kg	☼	01/24/14 15:26	01/28/14 14:38	10
Chromium	13		0.23	mg/Kg	☼	01/24/14 15:26	01/28/14 14:38	10
Copper	35		0.46	mg/Kg	☼	01/24/14 15:26	01/28/14 14:38	10
Lead	16		0.23	mg/Kg	☼	01/24/14 15:26	01/28/14 14:38	10
Nickel	7.1		0.57	mg/Kg	☼	01/24/14 15:26	01/28/14 14:38	10
Silver	0.053	J	0.23	mg/Kg	☼	01/24/14 15:26	01/28/14 14:38	10
Zinc	78		2.3	mg/Kg	☼	01/24/14 15:26	01/28/14 14:38	10

Client Sample ID: BSG-2
Date Collected: 01/15/14 10:45
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-12
Matrix: Solid
Percent Solids: 71.6

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5		0.45	mg/Kg	☼	01/24/14 15:26	01/28/14 17:01	10
Copper	15		0.36	mg/Kg	☼	01/24/14 15:26	01/28/14 17:01	10
Zinc	19		1.8	mg/Kg	☼	01/24/14 15:26	01/28/14 17:01	10

Client Sample ID: SG-13
Date Collected: 01/15/14 11:08
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-13
Matrix: Solid
Percent Solids: 54.9

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	13		0.83	mg/Kg	☼	01/24/14 15:26	01/28/14 17:06	10
Cadmium	1.0		0.33	mg/Kg	☼	01/24/14 15:26	01/28/14 17:06	10
Chromium	20		0.33	mg/Kg	☼	01/24/14 15:26	01/28/14 17:06	10
Copper	58		0.66	mg/Kg	☼	01/24/14 15:26	01/28/14 17:06	10
Lead	27		0.33	mg/Kg	☼	01/24/14 15:26	01/28/14 17:06	10
Nickel	13		0.83	mg/Kg	☼	01/24/14 15:26	01/28/14 17:06	10

Method: 6020 - Metals (ICP/MS) (Continued)

Client Sample ID: SG-13 — **Lab Sample ID: 580-41997-13**
Date Collected: 01/15/14 11:08 — **Matrix: Solid**
Date Received: 01/16/14 15:59 — **Percent Solids: 54.9**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.13	J	0.33	mg/Kg	☼	01/24/14 15:26	01/28/14 17:06	10
Zinc	170		3.3	mg/Kg	☼	01/24/14 15:26	01/28/14 17:06	10

Client Sample ID: SG-14 — **Lab Sample ID: 580-41997-14**
Date Collected: 01/15/14 11:41 — **Matrix: Solid**
Date Received: 01/16/14 15:59 — **Percent Solids: 69.3**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	6.6		0.51	mg/Kg	☼	01/24/14 15:26	01/28/14 17:11	10
Copper	200		0.41	mg/Kg	☼	01/24/14 15:26	01/28/14 17:11	10
Zinc	650		2.0	mg/Kg	☼	01/24/14 15:26	01/28/14 17:11	10

Client Sample ID: SG-18 — **Lab Sample ID: 580-41997-15**
Date Collected: 01/15/14 11:58 — **Matrix: Solid**
Date Received: 01/16/14 15:59 — **Percent Solids: 65.2**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	45		0.57	mg/Kg	☼	01/24/14 15:26	01/28/14 17:16	10
Copper	100		0.46	mg/Kg	☼	01/24/14 15:26	01/28/14 17:16	10
Zinc	170		2.3	mg/Kg	☼	01/24/14 15:26	01/28/14 17:16	10

Method: 7471A - Mercury (CVAA)

Client Sample ID: SG-10
Date Collected: 01/15/14 10:05
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-11
Matrix: Solid
Percent Solids: 74.5

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.026		0.018	mg/Kg	☼	01/21/14 10:49	01/21/14 12:11	1

Client Sample ID: SG-13
Date Collected: 01/15/14 11:08
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-13
Matrix: Solid
Percent Solids: 54.9

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.078		0.027	mg/Kg	☼	01/21/14 10:49	01/21/14 12:23	1

Client: Landau & Associates, Inc.
Project/Site: Can Am/Tru Grit

TestAmerica Job ID: 580-41997-1

General Chemistry

Client Sample ID: SG-10
Date Collected: 01/15/14 10:05
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-11
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	4600		2000	mg/Kg			01/27/14 12:59	1

Client Sample ID: SG-13
Date Collected: 01/15/14 11:08
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-13
Matrix: Solid

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	19000		2000	mg/Kg			01/27/14 12:45	1

Method: D422 - Grain Size

Client Sample ID: SG-10
Date Collected: 01/15/14 10:05
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-11
Matrix: Solid

Analyte	Result	Qualifier	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gravel	0.9			%			01/29/14 12:19	1
Coarse Sand	1.7			%			01/29/14 12:19	1
Medium Sand	19.2			%			01/29/14 12:19	1
Fine Sand	68.5			%			01/29/14 12:19	1
Silt	2.7			%			01/29/14 12:19	1
Clay	7.0			%			01/29/14 12:19	1
Sieve Size #230	0.04			%			01/29/14 12:19	1

Client Sample ID: SG-13
Date Collected: 01/15/14 11:08
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-13
Matrix: Solid

Analyte	Result	Qualifier	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gravel	0.7			%			01/29/14 12:19	1
Coarse Sand	1.3			%			01/29/14 12:19	1
Medium Sand	2.3			%			01/29/14 12:19	1
Fine Sand	16.6			%			01/29/14 12:19	1
Silt	51.6			%			01/29/14 12:19	1
Clay	27.5			%			01/29/14 12:19	1
Sieve Size #230	2.0			%			01/29/14 12:19	1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-153105/1-A
Matrix: Solid
Analysis Batch: 153132

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 153105

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		5.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
1,2-Dichlorobenzene	ND		5.5	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
1,4-Dichlorobenzene	ND		5.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
2,4-Dimethylphenol	ND		10	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
2-Methylnaphthalene	ND		2.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
2-Methylphenol	ND		10	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
3 & 4 Methylphenol	ND		20	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Acenaphthene	ND		2.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Acenaphthylene	ND		2.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Anthracene	ND		2.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Benzo[a]anthracene	ND		2.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Benzo[a]pyrene	ND		3.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Benzo[g,h,i]perylene	ND		2.5	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Benzofluoranthene	ND		4.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Benzoic acid	ND		250	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Benzyl alcohol	ND		10	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Bis(2-ethylhexyl) phthalate	ND		60	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Butyl benzyl phthalate	ND		20	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Chrysene	ND		2.5	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Dibenz(a,h)anthracene	ND		4.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Dibenzofuran	ND		10	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Diethyl phthalate	1.61	J	20	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Dimethyl phthalate	ND		10	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Di-n-butyl phthalate	ND		50	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Di-n-octyl phthalate	ND		50	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Fluoranthene	ND		2.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Fluorene	ND		2.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Hexachlorobenzene	ND		5.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Hexachlorobutadiene	ND		5.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Indeno[1,2,3-cd]pyrene	ND		4.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Naphthalene	ND		2.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
N-Nitrosodiphenylamine	ND		5.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Pentachlorophenol	ND		20	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Phenanthrene	ND		2.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Phenol	1.98	J	10	ug/Kg		02/04/14 08:33	02/04/14 15:37	1
Pyrene	ND		2.0	ug/Kg		02/04/14 08:33	02/04/14 15:37	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*85*		*28 - 143*	*02/04/14 08:33*	*02/04/14 15:37*	*1*
2-Fluorobiphenyl	*81*		*42 - 140*	*02/04/14 08:33*	*02/04/14 15:37*	*1*
2-Fluorophenol	*101*		*36 - 145*	*02/04/14 08:33*	*02/04/14 15:37*	*1*
Nitrobenzene-d5	*86*		*38 - 141*	*02/04/14 08:33*	*02/04/14 15:37*	*1*
Phenol-d5	*87*		*38 - 149*	*02/04/14 08:33*	*02/04/14 15:37*	*1*
Terphenyl-d14	*94*		*42 - 151*	*02/04/14 08:33*	*02/04/14 15:37*	*1*

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-153105/2-A
Matrix: Solid
Analysis Batch: 153132

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 153105

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,4-Trichlorobenzene	200	181		ug/Kg		90	63 - 128
1,2-Dichlorobenzene	200	173		ug/Kg		87	68 - 118
1,4-Dichlorobenzene	200	176		ug/Kg		88	62 - 132
2,4-Dimethylphenol	200	215		ug/Kg		108	58 - 133
2-Methylnaphthalene	200	189		ug/Kg		95	65 - 125
2-Methylphenol	200	186		ug/Kg		93	56 - 121
3 & 4 Methylphenol	200	178		ug/Kg		89	61 - 126
Acenaphthene	200	187		ug/Kg		93	65 - 130
Acenaphthylene	200	186		ug/Kg		93	69 - 129
Anthracene	200	195		ug/Kg		97	73 - 123
Benzo[a]anthracene	200	203		ug/Kg		102	64 - 124
Benzo[a]pyrene	200	209		ug/Kg		104	68 - 128
Benzo[g,h,i]perylene	200	209		ug/Kg		105	57 - 142
Benzofluoranthene	400	422		ug/Kg		105	57 - 137
Benzoic acid	400	342		ug/Kg		85	10 - 130
Benzyl alcohol	200	189		ug/Kg		94	42 - 147
Bis(2-ethylhexyl) phthalate	200	206		ug/Kg		103	64 - 144
Butyl benzyl phthalate	200	202		ug/Kg		101	65 - 140
Chrysene	200	208		ug/Kg		104	71 - 126
Dibenz(a,h)anthracene	200	226		ug/Kg		113	57 - 142
Dibenzofuran	200	189		ug/Kg		95	70 - 125
Diethyl phthalate	200	195		ug/Kg		97	64 - 129
Dimethyl phthalate	200	196		ug/Kg		98	65 - 125
Di-n-butyl phthalate	200	201		ug/Kg		101	69 - 124
Di-n-octyl phthalate	200	214		ug/Kg		107	58 - 148
Fluoranthene	200	195		ug/Kg		97	61 - 121
Fluorene	200	191		ug/Kg		95	68 - 128
Hexachlorobenzene	200	175		ug/Kg		87	61 - 136
Hexachlorobutadiene	200	180		ug/Kg		90	59 - 134
Indeno[1,2,3-cd]pyrene	200	208		ug/Kg		104	59 - 139
Naphthalene	200	182		ug/Kg		91	64 - 129
N-Nitrosodiphenylamine	200	200		ug/Kg		100	88 - 153
Pentachlorophenol	400	353		ug/Kg		88	29 - 124
Phenanthrene	200	195		ug/Kg		98	65 - 125
Phenol	200	185		ug/Kg		93	66 - 126
Pyrene	200	195		ug/Kg		97	54 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol	*104*		*28 - 143*
2-Fluorobiphenyl	*89*		*42 - 140*
2-Fluorophenol	*108*		*36 - 145*
Nitrobenzene-d5	*99*		*38 - 141*
Phenol-d5	*92*		*38 - 149*
Terphenyl-d14	*99*		*42 - 151*

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 580-153105/3-A
Matrix: Solid
Analysis Batch: 153132

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 153105

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	200	174		ug/Kg		87	63 - 128	4	28
1,2-Dichlorobenzene	200	179		ug/Kg		89	68 - 118	3	60
1,4-Dichlorobenzene	200	181		ug/Kg		91	62 - 132	3	32
2,4-Dimethylphenol	200	208		ug/Kg		104	58 - 133	3	60
2-Methylnaphthalene	200	182		ug/Kg		91	65 - 125	4	27
2-Methylphenol	200	190		ug/Kg		95	56 - 121	2	25
3 & 4 Methylphenol	200	184		ug/Kg		92	61 - 126	3	27
Acenaphthene	200	190		ug/Kg		95	65 - 130	2	27
Acenaphthylene	200	189		ug/Kg		94	69 - 129	2	28
Anthracene	200	196		ug/Kg		98	73 - 123	1	27
Benzo[a]anthracene	200	204		ug/Kg		102	64 - 124	0	27
Benzo[a]pyrene	200	203		ug/Kg		102	68 - 128	3	30
Benzo[g,h,i]perylene	200	204		ug/Kg		102	57 - 142	2	28
Benzofluoranthene	400	414		ug/Kg		104	57 - 137	2	31
Benzoic acid	400	332		ug/Kg		83	10 - 130	3	60
Benzyl alcohol	200	191		ug/Kg		95	42 - 147	1	60
Bis(2-ethylhexyl) phthalate	200	210		ug/Kg		105	64 - 144	2	60
Butyl benzyl phthalate	200	204		ug/Kg		102	65 - 140	1	60
Chrysene	200	206		ug/Kg		103	71 - 126	1	26
Dibenz(a,h)anthracene	200	220		ug/Kg		110	57 - 142	2	30
Dibenzofuran	200	190		ug/Kg		95	70 - 125	0	60
Diethyl phthalate	200	203		ug/Kg		101	64 - 129	4	26
Dimethyl phthalate	200	198		ug/Kg		99	65 - 125	1	60
Di-n-butyl phthalate	200	195		ug/Kg		97	69 - 124	3	60
Di-n-octyl phthalate	200	213		ug/Kg		106	58 - 148	0	31
Fluoranthene	200	192		ug/Kg		96	61 - 121	2	36
Fluorene	200	196		ug/Kg		98	68 - 128	3	31
Hexachlorobenzene	200	175		ug/Kg		87	61 - 136	0	60
Hexachlorobutadiene	200	173		ug/Kg		86	59 - 134	4	60
Indeno[1,2,3-cd]pyrene	200	206		ug/Kg		103	59 - 139	1	29
Naphthalene	200	178		ug/Kg		89	64 - 129	2	26
N-Nitrosodiphenylamine	200	204		ug/Kg		102	88 - 153	2	60
Pentachlorophenol	400	357		ug/Kg		89	29 - 124	1	68
Phenanthrene	200	192		ug/Kg		96	65 - 125	2	28
Phenol	200	189		ug/Kg		95	66 - 126	2	26
Pyrene	200	193		ug/Kg		96	54 - 134	1	31

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4,6-Tribromophenol	*102*		*28 - 143*
2-Fluorobiphenyl	*88*		*42 - 140*
2-Fluorophenol	*110*		*36 - 145*
Nitrobenzene-d5	*93*		*38 - 141*
Phenol-d5	*94*		*38 - 149*
Terphenyl-d14	*96*		*42 - 151*

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 580-152845/1-A
Matrix: Solid
Analysis Batch: 152994

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 152845

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.010	mg/Kg		01/29/14 11:18	01/31/14 11:17	1
PCB-1221	ND		0.011	mg/Kg		01/29/14 11:18	01/31/14 11:17	1
PCB-1232	ND		0.011	mg/Kg		01/29/14 11:18	01/31/14 11:17	1
PCB-1242	ND		0.010	mg/Kg		01/29/14 11:18	01/31/14 11:17	1
PCB-1248	ND		0.010	mg/Kg		01/29/14 11:18	01/31/14 11:17	1
PCB-1254	ND		0.010	mg/Kg		01/29/14 11:18	01/31/14 11:17	1
PCB-1260	ND		0.010	mg/Kg		01/29/14 11:18	01/31/14 11:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*109*		*45 - 135*	*01/29/14 11:18*	*01/31/14 11:17*	*1*
DCB Decachlorobiphenyl	*118*		*50 - 140*	*01/29/14 11:18*	*01/31/14 11:17*	*1*

Lab Sample ID: LCS 580-152845/2-A
Matrix: Solid
Analysis Batch: 152994

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 152845

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
PCB-1016	0.100	0.109		mg/Kg		109	40 - 140
PCB-1260	0.100	0.105		mg/Kg		105	60 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*104*		*45 - 135*
DCB Decachlorobiphenyl	*99*		*50 - 140*

Lab Sample ID: LCSD 580-152845/3-A
Matrix: Solid
Analysis Batch: 152994

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 152845

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
PCB-1016	0.100	0.121		mg/Kg		121	40 - 140	10	20
PCB-1260	0.100	0.115		mg/Kg		115	60 - 130	10	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*117*		*45 - 135*
DCB Decachlorobiphenyl	*107*		*50 - 140*

Lab Sample ID: 580-41997-13 MS
Matrix: Solid
Analysis Batch: 152994

Client Sample ID: SG-13
Prep Type: Total/NA
Prep Batch: 152845

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
PCB-1016	ND		0.177	0.236		mg/Kg	☼	134	40 - 140
PCB-1260	0.015	J	0.177	0.226		mg/Kg	☼	119	60 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Tetrachloro-m-xylene	*86*		*45 - 135*
DCB Decachlorobiphenyl	*78*		*50 - 140*

Method: 8082 - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: 580-41997-13 MSD
Matrix: Solid
Analysis Batch: 152994

Client Sample ID: SG-13
Prep Type: Total/NA
Prep Batch: 152845

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
PCB-1016	ND		0.181	0.219		mg/Kg	☼	122	40 - 140	7	20
PCB-1260	0.015	J	0.181	0.130	F2	mg/Kg	☼	63	60 - 130	54	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*85*		*45 - 135*
DCB Decachlorobiphenyl	*64*		*50 - 140*

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 580-152648/23-A
Matrix: Solid
Analysis Batch: 152822

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 152648

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	mg/Kg		01/24/14 15:26	01/28/14 14:19	10
Cadmium	ND		0.20	mg/Kg		01/24/14 15:26	01/28/14 14:19	10
Chromium	ND		0.20	mg/Kg		01/24/14 15:26	01/28/14 14:19	10
Copper	ND		0.40	mg/Kg		01/24/14 15:26	01/28/14 14:19	10
Lead	ND		0.20	mg/Kg		01/24/14 15:26	01/28/14 14:19	10
Nickel	ND		0.50	mg/Kg		01/24/14 15:26	01/28/14 14:19	10
Silver	ND		0.20	mg/Kg		01/24/14 15:26	01/28/14 14:19	10
Zinc	ND		2.0	mg/Kg		01/24/14 15:26	01/28/14 14:19	10

Lab Sample ID: LCS 580-152648/24-A
Matrix: Solid
Analysis Batch: 152822

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 152648

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	191		mg/Kg		95	80 - 120
Cadmium	5.00	4.96		mg/Kg		99	80 - 120
Chromium	20.0	19.1		mg/Kg		95	80 - 120
Copper	25.0	24.1		mg/Kg		96	80 - 120
Lead	50.0	48.2		mg/Kg		96	80 - 120
Nickel	50.0	48.0		mg/Kg		96	80 - 120
Silver	30.0	29.9		mg/Kg		100	80 - 120
Zinc	50.0	49.3		mg/Kg		99	80 - 120

Lab Sample ID: LCSD 580-152648/25-A
Matrix: Solid
Analysis Batch: 152822

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 152648

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	189		mg/Kg		95	80 - 120	1	20
Cadmium	5.00	5.06		mg/Kg		101	80 - 120	2	20
Chromium	20.0	19.0		mg/Kg		95	80 - 120	0	20
Copper	25.0	24.3		mg/Kg		97	80 - 120	1	20
Lead	50.0	48.1		mg/Kg		96	80 - 120	0	20
Nickel	50.0	48.6		mg/Kg		97	80 - 120	1	20

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-152648/25-A
Matrix: Solid
Analysis Batch: 152822

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 152648

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silver	30.0	29.8		mg/Kg		99	80 - 120	0	20
Zinc	50.0	49.9		mg/Kg		100	80 - 120	1	20

Lab Sample ID: 580-41997-11 MS
Matrix: Solid
Analysis Batch: 152822

Client Sample ID: SG-10
Prep Type: Total/NA
Prep Batch: 152648

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	7.8		207	203		mg/Kg	☼	94	80 - 120
Cadmium	0.14	J	5.18	5.23		mg/Kg	☼	98	80 - 120
Chromium	13		20.7	33.3		mg/Kg	☼	99	80 - 120
Copper	35		25.9	59.7		mg/Kg	☼	94	80 - 120
Lead	16		51.8	62.4		mg/Kg	☼	90	80 - 120
Nickel	7.1		51.8	57.1		mg/Kg	☼	96	80 - 120
Silver	0.053	J	31.1	30.3		mg/Kg	☼	97	80 - 120
Zinc	78		51.8	112	F1	mg/Kg	☼	65	80 - 120

Lab Sample ID: 580-41997-11 MSD
Matrix: Solid
Analysis Batch: 152822

Client Sample ID: SG-10
Prep Type: Total/NA
Prep Batch: 152648

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	7.8		200	196		mg/Kg	☼	94	80 - 120	3	20
Cadmium	0.14	J	5.01	4.92		mg/Kg	☼	95	80 - 120	6	20
Chromium	13		20.0	32.7		mg/Kg	☼	100	80 - 120	2	20
Copper	35		25.1	61.7		mg/Kg	☼	105	80 - 120	3	20
Lead	16		50.1	63.3		mg/Kg	☼	95	80 - 120	1	20
Nickel	7.1		50.1	55.3		mg/Kg	☼	96	80 - 120	3	20
Silver	0.053	J	30.1	28.6		mg/Kg	☼	95	80 - 120	6	20
Zinc	78		50.1	127		mg/Kg	☼	97	80 - 120	12	20

Lab Sample ID: 580-41997-11 DU
Matrix: Solid
Analysis Batch: 152822

Client Sample ID: SG-10
Prep Type: Total/NA
Prep Batch: 152648

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	7.8		7.11		mg/Kg	☼	9	20
Cadmium	0.14	J	0.140	J	mg/Kg	☼	0.7	20
Chromium	13		11.8		mg/Kg	☼	7	20
Copper	35		32.8		mg/Kg	☼	7	20
Lead	16		14.7		mg/Kg	☼	8	20
Nickel	7.1		6.49		mg/Kg	☼	9	20
Silver	0.053	J	0.0481	J	mg/Kg	☼	9	20
Zinc	78		72.3		mg/Kg	☼	8	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 580-152389/9-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 152416 — **Prep Batch: 152389**

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.017	mg/Kg		01/21/14 10:49	01/21/14 11:59	1

Lab Sample ID: LCS 580-152389/10-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 152416 — **Prep Batch: 152389**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.167	0.165		mg/Kg		99	80 - 120

Lab Sample ID: LCSD 580-152389/11-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 152416 — **Prep Batch: 152389**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.167	0.164		mg/Kg		99	80 - 120	0	20

Lab Sample ID: 580-41997-11 MS — **Client Sample ID: SG-10**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 152416 — **Prep Batch: 152389**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.026		0.167	0.195		mg/Kg	☼	101	80 - 120

Lab Sample ID: 580-41997-11 MSD — **Client Sample ID: SG-10**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 152416 — **Prep Batch: 152389**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.026		0.181	0.204		mg/Kg	☼	98	80 - 120	4	20

Lab Sample ID: 580-41997-11 DU — **Client Sample ID: SG-10**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 152416 — **Prep Batch: 152389**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	0.026		0.0272		mg/Kg	☼	4	20

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: MB 580-152694/3 — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 152694

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		2000	mg/Kg			01/27/14 12:39	1

Method: 9060_PSEP - TOC (Puget Sound) (Continued)

Lab Sample ID: LCS 580-152694/4
Matrix: Solid
Analysis Batch: 152694

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	2850	3280		mg/Kg		115	27.8 - 170

Lab Sample ID: LCSD 580-152694/5
Matrix: Solid
Analysis Batch: 152694

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	2850	3580		mg/Kg		126	27.8 - 170	9	35

Lab Sample ID: 580-41997-13 MS
Matrix: Solid
Analysis Batch: 152694

Client Sample ID: SG-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	19000		126000	165000		mg/Kg		116	50 - 140

Lab Sample ID: 580-41997-13 MSD
Matrix: Solid
Analysis Batch: 152694

Client Sample ID: SG-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	19000		115000	149000		mg/Kg		114	50 - 140	10	35

Lab Sample ID: 580-41997-13 DU
Matrix: Solid
Analysis Batch: 152694

Client Sample ID: SG-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon	19000		20300		mg/Kg		9	50

Lab Chronicle

Client: Landau & Associates, Inc
Project/Site: Can Am/Tru Grit

TestAmerica Job ID: 580-41997-1

Client Sample ID: SG-01

Lab Sample ID: 580-41997-1

Date Collected: 01/14/14 20:59
Matrix: Solid
Date Received: 01/16/14 15:59
Percent Solids: 67.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 16:04	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SG-02

Lab Sample ID: 580-41997-2

Date Collected: 01/14/14 21:03
Matrix: Solid
Date Received: 01/16/14 15:59
Percent Solids: 74.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 16:09	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SG-24

Lab Sample ID: 580-41997-3

Date Collected: 01/14/14 21:09
Matrix: Solid
Date Received: 01/16/14 15:59
Percent Solids: 78.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 16:14	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SG-03

Lab Sample ID: 580-41997-4

Date Collected: 01/14/14 21:13
Matrix: Solid
Date Received: 01/16/14 15:59
Percent Solids: 75.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 16:19	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SG-04

Lab Sample ID: 580-41997-5

Date Collected: 01/14/14 21:20
Matrix: Solid
Date Received: 01/16/14 15:59
Percent Solids: 75.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 16:23	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Can Am/Tru Grit

TestAmerica Job ID: 580-41997-1

Client Sample ID: SG-23

Lab Sample ID: 580-41997-6

Date Collected: 01/14/14 21:22
Matrix: Solid
Date Received: 01/16/14 15:59
Percent Solids: 71.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 16:28	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SG-15

Lab Sample ID: 580-41997-7

Date Collected: 01/15/14 08:54
Matrix: Solid
Date Received: 01/16/14 15:59
Percent Solids: 63.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 16:33	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SG-21

Lab Sample ID: 580-41997-8

Date Collected: 01/15/14 09:27
Matrix: Solid
Date Received: 01/16/14 15:59
Percent Solids: 63.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 16:38	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SG-20

Lab Sample ID: 580-41997-9

Date Collected: 01/15/14 09:48
Matrix: Solid
Date Received: 01/16/14 15:59
Percent Solids: 58.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 16:42	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SG-DUP

Lab Sample ID: 580-41997-10

Date Collected: 01/15/14 08:40
Matrix: Solid
Date Received: 01/16/14 15:59
Percent Solids: 60.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 16:47	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc
Project/Site: Can Am/Tru Grit

TestAmerica Job ID: 580-41997-1

Client Sample ID: SG-10

Date Collected: 01/15/14 10:05
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-11

Matrix: Solid
Percent Solids: 74.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550B			153105	02/04/14 08:33	RBD	TAL SEA
Total/NA	Analysis	8270C		10	153132	02/04/14 19:38	ERB	TAL SEA
Total/NA	Prep	3550B			152845	01/29/14 11:18	RBD	TAL SEA
Total/NA	Analysis	8082		1	152994	01/31/14 11:59	SGH	TAL SEA
Total/NA	Prep	7471A			152389	01/21/14 10:49	PAB	TAL SEA
Total/NA	Analysis	7471A		1	152416	01/21/14 12:11	FCW	TAL SEA
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 14:38	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152395	01/21/14 11:18	PAB	TAL SEA
Total/NA	Analysis	9060_PSEP		1	152694	01/27/14 12:59	RSB	TAL SEA
Total/NA	Analysis	D422		1	152861	01/29/14 12:19	HJM	TAL SEA

Client Sample ID: BSG-2

Date Collected: 01/15/14 10:45
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-12

Matrix: Solid
Percent Solids: 71.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 17:01	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SG-13

Date Collected: 01/15/14 11:08
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-13

Matrix: Solid
Percent Solids: 54.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550B			153105	02/04/14 08:33	RBD	TAL SEA
Total/NA	Analysis	8270C		10	153132	02/04/14 20:39	ERB	TAL SEA
Total/NA	Prep	3550B			152845	01/29/14 11:18	RBD	TAL SEA
Total/NA	Analysis	8082		1	152994	01/31/14 12:13	SGH	TAL SEA
Total/NA	Prep	7471A			152389	01/21/14 10:49	PAB	TAL SEA
Total/NA	Analysis	7471A		1	152416	01/21/14 12:23	FCW	TAL SEA
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 17:06	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152395	01/21/14 11:18	PAB	TAL SEA
Total/NA	Analysis	9060_PSEP		1	152694	01/27/14 12:45	RSB	TAL SEA
Total/NA	Analysis	D422		1	152861	01/29/14 12:19	HJM	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Can Am/Tru Grit

TestAmerica Job ID: 580-41997-1

Client Sample ID: SG-14

Date Collected: 01/15/14 11:41
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-14

Matrix: Solid
Percent Solids: 69.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 17:11	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SG-18

Date Collected: 01/15/14 11:58
Date Received: 01/16/14 15:59

Lab Sample ID: 580-41997-15

Matrix: Solid
Percent Solids: 65.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 17:16	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Certification Summary

Client: Landau & Associates, Inc.
Project/Site: Can Am/Tru Grit

TestAmerica Job ID: 580-41997-1

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C553	02-17-14

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
6020	3050B	Solid	Arsenic
6020	3050B	Solid	Cadmium
6020	3050B	Solid	Chromium
6020	3050B	Solid	Copper
6020	3050B	Solid	Lead
6020	3050B	Solid	Nickel
6020	3050B	Solid	Silver
6020	3050B	Solid	Zinc
8082	3550B	Solid	PCB-1016
8082	3550B	Solid	PCB-1221
8082	3550B	Solid	PCB-1232
8082	3550B	Solid	PCB-1242
8082	3550B	Solid	PCB-1248
8082	3550B	Solid	PCB-1254
8082	3550B	Solid	PCB-1260
8270C	3550B	Solid	1,2,4-Trichlorobenzene
8270C	3550B	Solid	1,2-Dichlorobenzene
8270C	3550B	Solid	1,4-Dichlorobenzene
8270C	3550B	Solid	2,4-Dimethylphenol
8270C	3550B	Solid	2-Methylnaphthalene
8270C	3550B	Solid	2-Methylphenol
8270C	3550B	Solid	3 & 4 Methylphenol
8270C	3550B	Solid	Acenaphthene
8270C	3550B	Solid	Acenaphthylene
8270C	3550B	Solid	Anthracene
8270C	3550B	Solid	Benzo[a]anthracene
8270C	3550B	Solid	Benzo[a]pyrene
8270C	3550B	Solid	Benzo[g,h,i]perylene
8270C	3550B	Solid	Benzofluoranthene
8270C	3550B	Solid	Benzoic acid
8270C	3550B	Solid	Benzyl alcohol
8270C	3550B	Solid	Bis(2-ethylhexyl) phthalate
8270C	3550B	Solid	Butyl benzyl phthalate
8270C	3550B	Solid	Chrysene
8270C	3550B	Solid	Dibenz(a,h)anthracene
8270C	3550B	Solid	Dibenzofuran
8270C	3550B	Solid	Diethyl phthalate
8270C	3550B	Solid	Dimethyl phthalate
8270C	3550B	Solid	Di-n-butyl phthalate
8270C	3550B	Solid	Di-n-octyl phthalate
8270C	3550B	Solid	Fluoranthene
8270C	3550B	Solid	Fluorene
8270C	3550B	Solid	Hexachlorobenzene
8270C	3550B	Solid	Hexachlorobutadiene
8270C	3550B	Solid	Indeno[1,2,3-cd]pyrene
8270C	3550B	Solid	Naphthalene

Certification Summary

Client: Landau & Associates, Inc.
Project/Site: Can Am/Tru Grit

TestAmerica Job ID: 580-41997-1

Laboratory: TestAmerica Seattle (Continued)

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C553	02-17-14

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
8270C	3550B	Solid	N-Nitrosodiphenylamine
8270C	3550B	Solid	Pentachlorophenol
8270C	3550B	Solid	Phenanthrene
8270C	3550B	Solid	Phenol
8270C	3550B	Solid	Pyrene
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
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Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-41998-1
Client Project/Site: CanAm/TruGrit

For:
Landau & Associates, Inc.
950 Pacific Avenue, Suite 515
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Landau & Associates, Inc
Project/Site: CanAm/TruGrit

TestAmerica Job ID: 580-41998-1

Job ID: 580-41998-1

Laboratory: TestAmerica Seattle

Narrative

Receipt
The samples were received on 1/17/2014 2:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 5.3° C.

Metals
No analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: CanAm/TruGrit

TestAmerica Job ID: 580-41998-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-41998-5	SC-10 (2-3)	Solid	01/16/14 17:15	01/17/14 14:30
580-41998-6	SC-10 (3-4)	Solid	01/16/14 17:16	01/17/14 14:30
580-41998-12	SC-12 (1-2)	Solid	01/16/14 17:52	01/17/14 14:30
580-41998-13	SC-12 (2-3)	Solid	01/16/14 17:55	01/17/14 14:30

41998

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LANDAU ASSOCIATES

Chain-of-Custody Record

Date 1/16/14
Page 1 of 7

Project Name Can Am / Tru Grit Project No. 024100.5.010.014
Project Location/Event Tacoma, WA
Sampler's Name Steve Shan + Brittany Gordon
Project Contact Jennifer Wynkoop
Send Results To Jennifer Wynkoop, Jeffrey Fellows, Anne Hathaway, Steve Shan

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Testing Parameters

Sample I.D.	Date	Time	Matrix	No. of Containers	Arsenic, Copper, Zinc Archive	Observations/Comments
SG-25	1/16/14	1120	Sediment	1	X	
SG-26		1138		1	X	
SG-27		1155		1	X	
SG-28		1213		1	X	
~~SC-10 (1-2)~~				1	X	SOS 1/16/14
SC-10 (2-3)		1715		1	X	
SC-10 (3-4)		1716		1	X	SOS 1/16/14
SC-10 (4-5)		1717		1	X	
SC-10 (5-6)		1724		1	X	
SC-10 (6-7)		1727		1	X	
SC-10 (7-8)		1728		1	X	
SC-10 (8-9)		1733		1	X	
SC-12 (1-2)		1752		1	X	
SC-12 (2-3)		1755		1	X	
SC-12 (3-4)		1800		1	X	
SC-12 (4-5)		1801		1	X	
SC-12 (5-6)		1805		1	X	
SC-12 (6-7)		1809		1	X	

Observations/Comments
X Allow water samples to settle, collect aliquot from clear portion
X NWTPH-Dx - run acid wash/silica gel cleanup
___ run samples standardized to _____ product
___ Analyze for EPH if no specific product identified
VOC/BTEX/VPH (soil):
___ non-preserved
___ preserved w/methanol
___ preserved w/sodium bisulfate
___ Freeze upon receipt
Dissolved metal water samples field filtered

580-41998 Chain of Custody

Special Shipment/Handling or Storage Requirements: cooler + ice
Method of Shipment: pickup @ office

Relinquished by	Received by	Relinquished by	Received by
Signature: Brittany N. Gordon	Signature: Sierra Mott	Signature: Sierra Mott	Signature: [illegible]
Printed Name: Brittany N Gordon	Printed Name: Sierra Mott	Printed Name: Sierra Mott	Printed Name: RJ McDaniel
Company: Landau Associates	Company: LAI	Company: LAI	Company: TA SEA
Date: 1/17/2014 Time: 0817	Date: 1/17/14 Time: 0820	Date: 1/17/14 Time: 1400	Date: 1-17-14 Time: 1400

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IR 5.3 IC: BILL WH 5.2

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Page 6 of 12

1/30/2014

41998

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☐ _____

LANDAU ASSOCIATES

Chain-of-Custody Record

Date 1/16/14
Page 2 of 2

Project Name Con Am / Tw Grt Project No. 0271005.010.014
Project Location/Event Tacoma, WA
Sampler's Name Steve Shaw & Brittany Gordon
Project Contact Jennifer Wynkoop
Send Results To Jennifer Wynkoop, Jeffrey Ribbens, Anne Helgeson, Steve Shaw

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Sample I.D.	Date	Time	Matrix	No. of Containers	Testing Parameters: Arsenic, Copper, 2hr Archive	Observations/Comments
SC-12 (7-8)	1/16/14	1811	Sediment	1	X	

Observations/Comments:
- X Allow water samples to settle, collect aliquot from clear portion
- X NWTPH-Dx - run acid wash/silica gel cleanup
- ___ run samples standardized to _____ product
- ___ Analyze for EPH if no specific product identified
- VOC/BTEX/VPH (soil):
  - ___ non-preserved
  - ___ preserved w/methanol
  - ___ preserved w/sodium bisulfate
  - ___ Freeze upon receipt
- ___ Dissolved metal water samples field filtered
- Other _____

Special Shipment/Handling or Storage Requirements: Cooler + ice
Method of Shipment: pickup @ office

Relinquished by	Received by	Relinquished by	Received by
Signature: Brittany N. Gordon	Signature: Sierra Motta	Signature: Sierra Motta	Signature:
Printed Name: Brittany N Gordon	Printed Name: Sierra Motta	Printed Name: Sierra Motta	Printed Name: R.J. McDaniel
Company: Landau Associates	Company: LAI	Company: LAI	Company: FA SEA
Date: 1/17/2014 Time: 0817	Date: 1/17/14 Time: 0820	Date: 1/17/14 Time: 1400	Date: 1-17-14 Time: 14:00

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IR 5.3 5.2 14:30
...ics LAB SAMPLES BUBBLE ...

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-41998-1

Login Number: 41998
List Number: 1
Creator: McDaniel, Ronald T

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 6020 - Metals (ICP/MS)

Client Sample ID: SC-10 (2-3) — **Lab Sample ID: 580-41998-5**
Date Collected: 01/16/14 17:15 — **Matrix: Solid**
Date Received: 01/17/14 14:30 — **Percent Solids: 81.2**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	31		0.42	mg/Kg	☼	01/24/14 15:26	01/28/14 17:21	10
Copper	120		0.33	mg/Kg	☼	01/24/14 15:26	01/28/14 17:21	10
Zinc	190		1.7	mg/Kg	☼	01/24/14 15:26	01/28/14 17:21	10

Client Sample ID: SC-10 (3-4) — **Lab Sample ID: 580-41998-6**
Date Collected: 01/16/14 17:16 — **Matrix: Solid**
Date Received: 01/17/14 14:30 — **Percent Solids: 71.9**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.8		0.59	mg/Kg	☼	01/24/14 15:26	01/28/14 17:25	10
Copper	27		0.47	mg/Kg	☼	01/24/14 15:26	01/28/14 17:25	10
Zinc	36		2.3	mg/Kg	☼	01/24/14 15:26	01/28/14 17:25	10

Client Sample ID: SC-12 (1-2) — **Lab Sample ID: 580-41998-12**
Date Collected: 01/16/14 17:52 — **Matrix: Solid**
Date Received: 01/17/14 14:30 — **Percent Solids: 61.7**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	120		0.60	mg/Kg	☼	01/24/14 15:26	01/28/14 17:30	10
Copper	210		0.48	mg/Kg	☼	01/24/14 15:26	01/28/14 17:30	10
Zinc	450		2.4	mg/Kg	☼	01/24/14 15:26	01/28/14 17:30	10

Client Sample ID: SC-12 (2-3) — **Lab Sample ID: 580-41998-13**
Date Collected: 01/16/14 17:55 — **Matrix: Solid**
Date Received: 01/17/14 14:30 — **Percent Solids: 54.1**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	49		0.69	mg/Kg	☼	01/24/14 15:26	01/28/14 17:35	10
Copper	47		0.55	mg/Kg	☼	01/24/14 15:26	01/28/14 17:35	10
Zinc	66		2.8	mg/Kg	☼	01/24/14 15:26	01/28/14 17:35	10

QC Sample Results

Client: Landau & Associates, Inc.
Project/Site: CanAm/TruGrit

TestAmerica Job ID: 580-41998-1

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 580-152648/23-A
Matrix: Solid
Analysis Batch: 152822

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 152648

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	mg/Kg		01/24/14 15:26	01/28/14 14:19	10
Copper	ND		0.40	mg/Kg		01/24/14 15:26	01/28/14 14:19	10
Zinc	ND		2.0	mg/Kg		01/24/14 15:26	01/28/14 14:19	10

Lab Sample ID: LCS 580-152648/24-A
Matrix: Solid
Analysis Batch: 152822

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 152648

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	191		mg/Kg		95	80 - 120
Copper	25.0	24.1		mg/Kg		96	80 - 120
Zinc	50.0	49.3		mg/Kg		99	80 - 120

Lab Sample ID: LCSD 580-152648/25-A
Matrix: Solid
Analysis Batch: 152822

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 152648

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	189		mg/Kg		95	80 - 120	1	20
Copper	25.0	24.3		mg/Kg		97	80 - 120	1	20
Zinc	50.0	49.9		mg/Kg		100	80 - 120	1	20

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: CanAm/TruGrit

TestAmerica Job ID: 580-41998-1

Client Sample ID: SC-10 (2-3)

Lab Sample ID: 580-41998-5

Date Collected: 01/16/14 17:15
Matrix: Solid
Date Received: 01/17/14 14:30
Percent Solids: 81.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 17:21	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-10 (3-4)

Lab Sample ID: 580-41998-6

Date Collected: 01/16/14 17:16
Matrix: Solid
Date Received: 01/17/14 14:30
Percent Solids: 71.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 17:25	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-12 (1-2)

Lab Sample ID: 580-41998-12

Date Collected: 01/16/14 17:52
Matrix: Solid
Date Received: 01/17/14 14:30
Percent Solids: 61.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 17:30	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-12 (2-3)

Lab Sample ID: 580-41998-13

Date Collected: 01/16/14 17:55
Matrix: Solid
Date Received: 01/17/14 14:30
Percent Solids: 54.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152648	01/24/14 15:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152822	01/28/14 17:35	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Certification Summary

Client: Landau & Associates, Inc.
Project/Site: CanAm/TruGrit

TestAmerica Job ID: 580-41998-1

Laboratory: TestAmerica Seattle

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C553	02-17-14

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-41998-2
Client Project/Site: CanAm/TruGrit

For:
Landau & Associates, Inc.
950 Pacific Avenue, Suite 515
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Authorized for release by:
2/13/2014 2:03:29 PM

Melissa Armstrong, Project Manager I
(253)922-2310 x135
melissa.armstrong@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Landau & Associates, Inc.
Project/Site: CanAm/TruGrit

TestAmerica Job ID: 580-41998-2

Job ID: 580-41998-2

Laboratory: TestAmerica Seattle

Narrative

Receipt
The samples were received on 1/17/2014 2:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.3° C.

Except:
The following sample(s) were activated by the client on 2/4/14: SG-25 (580-41998-1), SG-26 (580-41998-2), SG-27 (580-41998-3) and SG-28 (580-41998-4). A revised COC has been added to the job.

Metals - Method(s) 6020
The matrix spike duplicate (MSD) recovery and precision for analysis batch 153504 was outside control limits for Copper. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. Affected data has been qualified and reported.

No other analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: CanAm/TruGrit

TestAmerica Job ID: 580-41998-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-41998-1	SG-25	Solid	01/16/14 11:20	01/17/14 14:30
580-41998-2	SG-26	Solid	01/16/14 11:38	01/17/14 14:30
580-41998-3	SG-27	Solid	01/16/14 11:55	01/17/14 14:30
580-41998-4	SG-28	Solid	01/16/14 12:13	01/17/14 14:30

Definitions/Glossary

Client: Landau & Associates, Inc.
Project/Site: CanAm/TruGrit

TestAmerica Job ID: 580-41998-2

Qualifiers

Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits
F2	MS/MSD RPD exceeds control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

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REVISED 2/4/14

Chain-of-Custody Record

Date 1/16/14
Page 1 of 2

Project Name Seacon/Tacoma Grit Project No. 027.005.010.014
Project Location/Event Tacoma, WA
Sampler's Name Steve Shea & Bobby Gordon
Project Contact Jennifer Weyrauch
Send Results To Jennifer Weyrauch, Jeffrey Fellows, Anne Hillman, Steve Shea

Testing Parameters

Turnaround Time
☑ Standard
☐ Accelerated
☐ _____

Sample I.D.	Date	Time	Matrix	No. of Containers	Archive Composite Grab	Archive Grab	Observations/Comments
SG-25	1/16/14	1120	Sediment	1	X	X	Analyze SG-25 SG-26 SG-27 SG-28 for As Cu Zn Sb 2/4/14
SG-26		1138		1	X	X	
SG-27		1155		1	X	X	
SG-28		1213		1	X	X	
~~SG-10 (1-2)~~							
SC-10 (2-3)		1715		1		X	
SC-10 (3-4)		1716		1	X	X	
SC-10 (4-5)		1717		1		X	
SC-10 (5-6)		1724		1		X	
SC-10 (6-7)		1727		1		X	
SC-10 (7-8)		1728		1		X	
SC-10 (8-9)		1733		1		X	
SC-12 (1-2)		1752		1	X		
SC-12 (2-3)		1755		1	X		
SC-12 (3-4)		1800		1		X	
SC-12 (4-5)		1801		1		X	
SC-12 (5-6)		1805		1		X	
SC-12 (6-7)		1808		1		X	

Observations/Comments
- X Allow water samples to settle, collect aliquot from clear portion
- X NWTPH-Dx - run acid wash/silica gel cleanup
- ___ run samples standardized to _____ product
- ___ Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
- ___ non-preserved
- ___ preserved w/methanol
- ___ preserved w/sodium bisulfate
- ___ Freeze upon receipt

- ___ Dissolved metal water samples field filtered

Other _____

Special Shipment/Handling or Storage Requirements Cool + ice

Method of Shipment pick-up to office

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Printed Name	Printed Name	Printed Name	Printed Name
Company Landau Associates	Company LAI	Company LAI	Company LAI
Date 1/17/14 Time 0917	Date 1/17/14 Time 0920	Date 1/17/14 Time 1400	Date 1/17/14 Time 1400

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LANDAU ASSOCIATES

Chain-of-Custody Record

Date 1/16/14

Page 2 of 2

Project Name Con Am / Tar Gas Project No. 127025.010.01

Project Location/Event Tacoma, WA

Sampler's Name Steve Shaw & Brittany Gordon

Project Contact Jennifer Hyatt Lamp

Send Results To Jennifer Hyatt Lamp, Tiffany Fellows, Anne Hallmann, Steve Shaw PT

Sample I.D.	Date	Time	Matrix	No. of Containers	Testing Parameters: Arsenic, Cobalt, Nickel	Observations/Comments
SC-12 (2-8)	1/16/14	1811	Soil	1	X	

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Observations/Comments

_X_ Allow water samples to settle, collect aliquot from clear portion

_X_ NWTPH-Dx - run acid wash/silica gel cleanup

___ run samples standardized to _____ product

___ Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
___ non-preserved
___ preserved w/methanol
___ preserved w/sodium bisulfate
___ Freeze upon receipt

___ Dissolved metal water samples field filtered

Other _____

Special Shipment/Handling or Storage Requirements Cool & ice

Method of Shipment pickup @ office

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Printed Name Brittany A Gordon	Printed Name	Printed Name	Printed Name
Company Landau Associates	Company LAI	Company LAI	Company EA
Date 1/17/2014 Time 0817	Date 1/17/14 Time 0820	Date 1/17/14 Time 1400	Date 1-17-14 Time 1400

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Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-41998-2

Login Number: 41998
List Number: 1
Creator: McDaniel, Ronald T

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 6020 - Metals (ICP/MS)

Client Sample ID: SG-25
Date Collected: 01/16/14 11:20
Date Received: 01/17/14 14:30

Lab Sample ID: 580-41998-1
Matrix: Solid
Percent Solids: 75.0

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.3		0.50	mg/Kg	☼	02/11/14 12:06	02/11/14 15:12	10
Copper	36		0.40	mg/Kg	☼	02/11/14 12:06	02/11/14 15:12	10
Zinc	51		2.0	mg/Kg	☼	02/11/14 12:06	02/11/14 15:12	10

Client Sample ID: SG-26
Date Collected: 01/16/14 11:38
Date Received: 01/17/14 14:30

Lab Sample ID: 580-41998-2
Matrix: Solid
Percent Solids: 68.6

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.0		0.68	mg/Kg	☼	02/11/14 12:06	02/11/14 15:46	10
Copper	23		0.54	mg/Kg	☼	02/11/14 12:06	02/11/14 15:46	10
Zinc	32		2.7	mg/Kg	☼	02/11/14 12:06	02/11/14 15:46	10

Client Sample ID: SG-27
Date Collected: 01/16/14 11:55
Date Received: 01/17/14 14:30

Lab Sample ID: 580-41998-3
Matrix: Solid
Percent Solids: 72.9

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.1		0.46	mg/Kg	☼	02/11/14 12:06	02/11/14 15:50	10
Copper	28		0.37	mg/Kg	☼	02/11/14 12:06	02/11/14 15:50	10
Zinc	42		1.8	mg/Kg	☼	02/11/14 12:06	02/11/14 15:50	10

Client Sample ID: SG-28
Date Collected: 01/16/14 12:13
Date Received: 01/17/14 14:30

Lab Sample ID: 580-41998-4
Matrix: Solid
Percent Solids: 58.9

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.3		0.82	mg/Kg	☼	02/11/14 12:06	02/11/14 15:55	10
Copper	36		0.65	mg/Kg	☼	02/11/14 12:06	02/11/14 15:55	10
Zinc	49		3.3	mg/Kg	☼	02/11/14 12:06	02/11/14 15:55	10

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 580-153463/10-A
Matrix: Solid
Analysis Batch: 153504

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 153463

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	mg/Kg		02/11/14 12:06	02/11/14 14:48	10
Copper	ND		0.40	mg/Kg		02/11/14 12:06	02/11/14 14:48	10
Zinc	ND		2.0	mg/Kg		02/11/14 12:06	02/11/14 14:48	10

Lab Sample ID: LCS 580-153463/11-A
Matrix: Solid
Analysis Batch: 153504

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 153463

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	194		mg/Kg		97	80 - 120
Copper	25.0	24.9		mg/Kg		100	80 - 120
Zinc	50.0	48.0		mg/Kg		96	80 - 120

Lab Sample ID: LCSD 580-153463/12-A
Matrix: Solid
Analysis Batch: 153504

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 153463

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	191		mg/Kg		96	80 - 120	1	20
Copper	25.0	25.0		mg/Kg		100	80 - 120	0	20
Zinc	50.0	46.7		mg/Kg		93	80 - 120	3	20

Lab Sample ID: 580-41998-1 MS
Matrix: Solid
Analysis Batch: 153504

Client Sample ID: SG-25
Prep Type: Total/NA
Prep Batch: 153463

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	7.3		251	249		mg/Kg	☼	96	80 - 120
Copper	36		31.4	71.9		mg/Kg	☼	114	80 - 120
Zinc	51		62.8	116		mg/Kg	☼	104	80 - 120

Lab Sample ID: 580-41998-1 MSD
Matrix: Solid
Analysis Batch: 153504

Client Sample ID: SG-25
Prep Type: Total/NA
Prep Batch: 153463

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	7.3		197	206		mg/Kg	☼	101	80 - 120	19	20
Copper	36		24.6	55.3	F1 F2	mg/Kg	☼	78	80 - 120	26	20
Zinc	51		49.2	108		mg/Kg	☼	116	80 - 120	7	20

Lab Sample ID: 580-41998-1 DU
Matrix: Solid
Analysis Batch: 153504

Client Sample ID: SG-25
Prep Type: Total/NA
Prep Batch: 153463

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	7.3		7.25		mg/Kg	☼	1	20
Copper	36		35.4		mg/Kg	☼	2	20
Zinc	51		50.2		mg/Kg	☼	2	20

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: CanAm/TruGrit

TestAmerica Job ID: 580-41998-2

Client Sample ID: SG-25

Lab Sample ID: 580-41998-1
Date Collected: 01/16/14 11:20
Matrix: Solid
Date Received: 01/17/14 14:30
Percent Solids: 75.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			153463	02/11/14 12:06	PAB	TAL SEA
Total/NA	Analysis	6020		10	153504	02/11/14 15:12	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	153340	02/08/14 09:17	RMB	TAL SEA

Client Sample ID: SG-26

Lab Sample ID: 580-41998-2
Date Collected: 01/16/14 11:38
Matrix: Solid
Date Received: 01/17/14 14:30
Percent Solids: 68.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			153463	02/11/14 12:06	PAB	TAL SEA
Total/NA	Analysis	6020		10	153504	02/11/14 15:46	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	153340	02/08/14 09:17	RMB	TAL SEA

Client Sample ID: SG-27

Lab Sample ID: 580-41998-3
Date Collected: 01/16/14 11:55
Matrix: Solid
Date Received: 01/17/14 14:30
Percent Solids: 72.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			153463	02/11/14 12:06	PAB	TAL SEA
Total/NA	Analysis	6020		10	153504	02/11/14 15:50	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	153340	02/08/14 09:17	RMB	TAL SEA

Client Sample ID: SG-28

Lab Sample ID: 580-41998-4
Date Collected: 01/16/14 12:13
Matrix: Solid
Date Received: 01/17/14 14:30
Percent Solids: 58.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			153463	02/11/14 12:06	PAB	TAL SEA
Total/NA	Analysis	6020		10	153504	02/11/14 15:55	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	153340	02/08/14 09:17	RMB	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Certification Summary

Client: Landau & Associates, Inc.
Project/Site: CanAm/TruGrit

TestAmerica Job ID: 580-41998-2

Laboratory: TestAmerica Seattle

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C553	02-17-14

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-42028-1
Client Project/Site: Can AM/ Tru Grit

For:
Landau & Associates, Inc.
950 Pacific Avenue, Suite 515
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Authorized for release by:
1/31/2014 11:47:24 AM

Melissa Armstrong, Project Manager I
(253)922-2310 x135
melissa.armstrong@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Landau & Associates, Inc.
Project/Site: Can AM/ Tru Grit

TestAmerica Job ID: 580-42028-1

Job ID: 580-42028-1

Laboratory: TestAmerica Seattle

Narrative

Receipt
The samples were received on 1/22/2014 5:21 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.2° C.

Metals - Method(s) 6020
The matrix spike / matrix spike duplicate (MS/MSD) recoveries for prep batch 152940 were outside control limits. In addition, the RPD limit was outside control limits. Non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. Affected data has been qualified accordingly and reported.

No other analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Qualifiers

Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits
F2	MS/MSD RPD exceeds control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: Can AM/ Tru Grit

TestAmerica Job ID: 580-42028-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-42028-1	SC-17(2-3)	Solid	01/21/14 09:48	01/22/14 17:21
580-42028-2	SC-17(3-4)	Solid	01/21/14 09:50	01/22/14 17:21
580-42028-6	SC-09(1-2)	Solid	01/21/14 10:28	01/22/14 17:21
580-42028-7	SC-09(2-3)	Solid	01/21/14 10:30	01/22/14 17:21
580-42028-12	SC-13(3-4)	Solid	01/21/14 11:15	01/22/14 17:21
580-42028-13	SC-13(5-6)	Solid	01/21/14 11:21	01/22/14 17:21
580-42028-15	SC-16(1-2)	Solid	01/21/14 12:34	01/22/14 17:21
580-42028-16	SC-16(2-3)	Solid	01/21/14 12:45	01/22/14 17:21
580-42028-21	SC-14(1-2)	Solid	01/21/14 13:18	01/22/14 17:21
580-42028-22	SC-14(2-3)	Solid	01/21/14 13:20	01/22/14 17:21
580-42028-27	SC-07(1-2)	Solid	01/21/14 14:10	01/22/14 17:21
580-42028-28	SC-07(2-3)	Solid	01/21/14 14:13	01/22/14 17:21
580-42028-34	G-5(2-3)	Solid	01/21/14 14:52	01/22/14 17:21
580-42028-35	G-5(4-5)	Solid	01/21/14 14:55	01/22/14 17:21
580-42028-39	SC-05(1-2)	Solid	01/21/14 15:24	01/22/14 17:21
580-42028-40	SC-05(2-3)	Solid	01/21/14 15:26	01/22/14 17:21
580-42028-46	BSC-1(1-2)	Solid	01/21/14 16:00	01/22/14 17:21
580-42028-47	BSC-1(2-3)	Solid	01/21/14 16:02	01/22/14 17:21
580-42028-53	SC-DUP-1	Solid	01/21/14 08:00	01/22/14 17:21
580-42028-54	SC-DUP-2	Solid	01/21/14 08:01	01/22/14 17:21
580-42028-56	SC-08(1-2)	Solid	01/21/14 16:30	01/22/14 17:21
580-42028-57	SC-08(2-3)	Solid	01/21/14 16:35	01/22/14 17:21
580-42028-63	Chunk-1	Solid	01/21/14 17:01	01/22/14 17:21

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42028

Date 1/21/14
Page 1 of 4

Chain-of-Custody Record

Project Name CanAm / Tr Grit Project No 0241008-010.014
Project Location/Event Tacoma, WA
Sampler's Name Brittany Gordon / Steve Shaw
Project Contact Jennifer Wynkoop
Send Results To Jennifer Wynkoop, Jeffrey Ribas, Anne Helgerson, Steve Shaw

Testing Parameters

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

580-42028 Chain of Custody

	Sample I.D.	Date	Time	Matrix	No. of Containers	As (total)	Cu (total)	Zn (total)	Archive	Observations/Comments
-01	SC-17(2-3)	1/21/14	0948	Sediment	1	X	X	X		
-02	SC-17(3-4)		0950			X	X	X		
-03	SC-17(4-5)		0954						X	
-04	SC-17(5-6)		1000						X	
-05	SC-17(6-7)		1002						X	
-06	SC-09(1-2)		1028			X	X	X		
-07	SC-09(2-3)		1030			X	X	X		
-08	SC-09(3-4)		1035						X	
-09	SC-09(4-5)		1037						X	
-10	SC-09(5-6)		1053						X	
-11	SC-09(6-7)		1056						X	
-12	SC-13(3-4)		1115			X	X	X		
-13	SC-13(5-6)		1121			X	X	X		
-14	SC-13(6-7)		1123						X	
-15	SC-16(1-2)		1234			X	X	X		
-16	SC-16(2-3)		1245			X	X	X		
-17	SC-16(3-4)		1247						X	
-18	SC-16(4-5)		1237						X	

Observations/Comments

☒ Allow water samples to settle, collect aliquot from clear portion

☒ NWTPH-Dx - run acid wash/silica gel cleanup

___ run samples standardized to _____ product

___ Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
___ non-preserved
___ preserved w/methanol
___ preserved w/sodium bisulfate
___ Freeze upon receipt

___ Dissolved metal water samples field filtered

Other _____

Special Shipment/Handling or Storage Requirements

Method of Shipment

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Printed Name: Steven D. Shaw	Printed Name: Melissa Armstrong	Printed Name	Printed Name
Company: Landau Associates	Company: TestAmerica	Company	Company
Date: 1/21/14 Time: 1721	Date: 1/21/14 Time: 17:21	Date Time	Date Time

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Date 1/21/14

Page 2 of 4

Chain-of-Custody Record

Project Name Can Am / Tw Cnt Project No. 027/008.010.01

Project Location/Event Tacoma, WA

Sampler's Name Steve Shan & Brittany Gordon

Project Contact Jennifer Wynkoop

Send Results To Jennifer Wynkoop, Jeffrey Ellison, Anne Helgeson, Steve Shan

Testing Parameters

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

	Sample I.D.	Date	Time	Matrix	No. of Containers	NSC (total)	Cu (total)	Zn (total)	Arsenic	Observations/Comments
-19	SC-16 (5-6)	1/21/14	1240	Sediment	1				X	
-20	SC-16 (6-7)		1242						X	
-21	SC-14 (1-2)		1318			X	X	X		
-22	SC-14 (2-3)		1320			X	X	X		
-23	SC-14 (3-4)		1322						X	
-24	SC-14 (4-5)		1324						X	
-25	SC-14 (5-6)		1326						X	
-26	SC-14 (6-7)		1328						X	
-27	SC-07 (1-2)		1410			X	X	X		
-28	SC-07 (2-3)		1413			X	X	X		
-29	SC-07 (3-4)		1416						X	
-30	SC-07 (4-5)		1419						X	
-31	SC-07 (5-6)		1422						X	
-32	SC-07 (6-7)		1425						X	
-33	SC-07 (7-8)		1427						X	
-34	G-5 (2-3)		1452			X	X	X		
-35	G-5 (4-5)		1455			X	X	X		
-36	G-5 (5-6)		1458						X	

_X_ Allow water samples to settle, collect aliquot from clear portion

_X_ NWTPH-Dx - *run acid wash/silica gel cleanup*

___ run samples standardized to _____ product

___ Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
___ non-preserved
___ preserved w/methanol
___ preserved w/sodium bisulfate
___ Freeze upon receipt

___ Dissolved metal water samples field filtered

Other _____

Special Shipment/Handling or Storage Requirements

Method of Shipment

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Steven D. Shan	Melissa Armstrong		
Printed Name	Printed Name	Printed Name	Printed Name
Landau Associates	TestAmerica		
Company	Company	Company	Company
Date 1/21/14 Time 1721	Date 1/21/14 Time 17:21	Date _____ Time _____	Date _____ Time _____

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Date 1/21/14
Page 3 of 4

Chain-of-Custody Record

Project Name ConAm/Tru Grit Project No. 041008.010.014
Project Location/Event Tacoma, WA
Sampler's Name Bethany Gordon + Steven Shaw
Project Contact Jennifer Wynkoop
Send Results To Jennifer Wynkoop, Jeffrey Fellows, Anne Helverson, Steve Shaw

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

	Sample I.D.	Date	Time	Matrix	No. of Containers	Arsenic	Copper	Zinc	Archive	Observations/Comments
-37	GT-5(6-7)	1/21/14	1502	Sediment	1				X	X Allow water samples to settle, collect aliquot from clear portion
-38	GT-5(7-8)		1505						X	
-39	SC-05(1-2)		1524			X	X	X		X NWTPH-Dx - run acid wash/silica gel cleanup
-40	SC-05(2-3)		1526			X	X	X		
-41	SC-05(3-4)		1528						X	___ run samples standardized to _____ product
-42	SC-05(4-5)		1530						X	
-43	SC-05(5-6)		1532						X	___ Analyze for EPH if no specific product identified
-44	SC-05(6-7)		1534						X	
-45	SC-05(7-8)		1536						X	VOC/BTEX/VPH (soil):
-46	BSC-1(1-2)		1600			X	X	X		___ non-preserved
-47	BSC-1(2-3)		1602			X	X	X		___ preserved w/methanol
-48	BSC-1(3-4)		1603						X	___ preserved w/sodium bisulfate
-49	BSC-1(4-5)		1605						X	___ Freeze upon receipt
-50	BSC-1(5-6)		1607						X	___ Dissolved metal water samples field filtered
-51	BSC-1(6-7)		1609						X	Other _____
-52	BSC-1(7-8)		1611						X	
-53	SC-DUP-1		0800			X	X	X		
-54	SC-DUP-2	↓	0801	↓	↓	X	X	X		

Special Shipment/Handling or Storage Requirements

Method of Shipment

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Steven D. Shaw	Melissa Armstrong		
Printed Name	Printed Name	Printed Name	Printed Name
Landau Associates	TestAmerica		
Company	Company	Company	Company
Date 1/21/14 Time 1724	Date 1/21/14 Time 1712	Date _____ Time _____	Date _____ Time _____

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☐ Portland (503) 542-1080
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Chain-of-Custody Record

Date 1/21/14
Page 4 of 4

Project Name CanAm/Tw Grt
Project No. 024/008.010.014
Project Location/Event Tacoma, WA
Sampler's Name Brittany Goeden & Steve Shaw
Project Contact Jennifer Wynkoop
Send Results To Jennifer Wynkoop, Jeffry Ripley, Anne Johnson, Steve Shaw

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

	Sample I.D.	Date	Time	Matrix	No. of Containers	Arsenic	Copper	Zinc	Acetone	Observations/Comments
-55	SC-Dup-3	1/21/14	0802	Sediment	1				X	
-56	SC-08(1-2)		1630			X	X	X		
-57	SC-08(2-3)		1635			X	X	X		
-58	SC-08(3-4)		1639						X	
-59	SC-08(4-5)		1643						X	
-60	SC-08(5-6)		1645						X	
-61	SC-08(6-7)		1647						X	
-62	SC-08(7-8)		1650						X	
-63	Chunk-1		1701			X	X	X		

Testing Parameters

X Allow water samples to settle, collect aliquot from clear portion

X NWTPH-Dx - run acid wash/silica gel cleanup

___ run samples standardized to _____ product

___ Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
___ non-preserved
___ preserved w/methanol
___ preserved w/sodium bisulfate
___ Freeze upon receipt

___ Dissolved metal water samples field filtered

Other * Chunk-1 is a consolidated clay sediment. Please crush/dissolve & analyze.

~~Cooler/TB~~ Dig/IR cor 5.2°C unc 5.1°C
Cooler Dsc walk-in @ Lab —
~~Wet/Packs~~ Packing N/A
In walk-in w/o Samples in-House

Special Shipment/Handling or Storage Requirements

Method of Shipment

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Steven D. Shaw	Melissa Armstrong		
Printed Name	Printed Name	Printed Name	Printed Name
Landau Associates	TestAmerica		
Company	Company	Company	Company
Date 1/21/14 Time 1721	Date 1/21/14 Time 17:21	Date _____ Time _____	Date _____ Time _____

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

Rev 8/09

1/31/2014

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-42028-1

Login Number: 42028

List Source: TestAmerica Seattle

List Number: 1

Creator: Luna, Francisco J

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 6020 - Metals (ICP/MS)

Client Sample ID: SC-17(2-3) — **Lab Sample ID: 580-42028-1**
Date Collected: 01/21/14 09:48 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 84.1**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1100		0.48	mg/Kg	☼	01/29/14 17:26	01/30/14 14:24	10
Copper	2000		0.38	mg/Kg	☼	01/29/14 17:26	01/30/14 14:24	10
Zinc	3000		1.9	mg/Kg	☼	01/29/14 17:26	01/30/14 14:24	10

Client Sample ID: SC-17(3-4) — **Lab Sample ID: 580-42028-2**
Date Collected: 01/21/14 09:50 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 83.0**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	110		0.45	mg/Kg	☼	01/29/14 17:26	01/30/14 14:29	10
Copper	490		0.36	mg/Kg	☼	01/29/14 17:26	01/30/14 14:29	10
Zinc	610		1.8	mg/Kg	☼	01/29/14 17:26	01/30/14 14:29	10

Client Sample ID: SC-09(1-2) — **Lab Sample ID: 580-42028-6**
Date Collected: 01/21/14 10:28 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 84.0**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.2		0.45	mg/Kg	☼	01/29/14 17:26	01/30/14 14:34	10
Copper	39		0.36	mg/Kg	☼	01/29/14 17:26	01/30/14 14:34	10
Zinc	46		1.8	mg/Kg	☼	01/29/14 17:26	01/30/14 14:34	10

Client Sample ID: SC-09(2-3) — **Lab Sample ID: 580-42028-7**
Date Collected: 01/21/14 10:30 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 72.7**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.0		0.58	mg/Kg	☼	01/29/14 17:26	01/30/14 14:38	10
Copper	27		0.46	mg/Kg	☼	01/29/14 17:26	01/30/14 14:38	10
Zinc	31		2.3	mg/Kg	☼	01/29/14 17:26	01/30/14 14:38	10

Client Sample ID: SC-13(3-4) — **Lab Sample ID: 580-42028-12**
Date Collected: 01/21/14 11:15 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 81.9**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1500		0.51	mg/Kg	☼	01/29/14 17:26	01/30/14 14:43	10
Copper	740		0.41	mg/Kg	☼	01/29/14 17:26	01/30/14 14:43	10
Zinc	3900		2.0	mg/Kg	☼	01/29/14 17:26	01/30/14 14:43	10

Client Sample ID: SC-13(5-6) — **Lab Sample ID: 580-42028-13**
Date Collected: 01/21/14 11:21 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 55.6**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	56		0.75	mg/Kg	☼	01/30/14 10:54	01/30/14 17:15	10
Copper	48		0.60	mg/Kg	☼	01/30/14 10:54	01/30/14 17:15	10
Zinc	160		3.0	mg/Kg	☼	01/30/14 10:54	01/30/14 17:15	10

Client Sample ID: SC-16(1-2) — **Lab Sample ID: 580-42028-15**
Date Collected: 01/21/14 12:34 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 70.6**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	79		0.47	mg/Kg	☼	01/30/14 10:54	01/30/14 17:49	10
Copper	260		0.38	mg/Kg	☼	01/30/14 10:54	01/30/14 17:49	10
Zinc	500		1.9	mg/Kg	☼	01/30/14 10:54	01/30/14 17:49	10

Method: 6020 - Metals (ICP/MS)

Client Sample ID: SC-16(2-3) — **Lab Sample ID: 580-42028-16**
Date Collected: 01/21/14 12:45 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 71.0**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	99		0.43	mg/Kg	☼	01/30/14 10:54	01/30/14 17:54	10
Copper	330		0.34	mg/Kg	☼	01/30/14 10:54	01/30/14 17:54	10
Zinc	380		1.7	mg/Kg	☼	01/30/14 10:54	01/30/14 17:54	10

Client Sample ID: SC-14(1-2) — **Lab Sample ID: 580-42028-21**
Date Collected: 01/21/14 13:18 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 70.5**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	310		0.57	mg/Kg	☼	01/30/14 10:54	01/30/14 17:58	10
Copper	810		0.45	mg/Kg	☼	01/30/14 10:54	01/30/14 17:58	10
Zinc	1000		2.3	mg/Kg	☼	01/30/14 10:54	01/30/14 17:58	10

Client Sample ID: SC-14(2-3) — **Lab Sample ID: 580-42028-22**
Date Collected: 01/21/14 13:20 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 67.8**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	200		0.52	mg/Kg	☼	01/30/14 10:54	01/30/14 18:03	10
Copper	780		0.42	mg/Kg	☼	01/30/14 10:54	01/30/14 18:03	10
Zinc	700		2.1	mg/Kg	☼	01/30/14 10:54	01/30/14 18:03	10

Client Sample ID: SC-07(1-2) — **Lab Sample ID: 580-42028-27**
Date Collected: 01/21/14 14:10 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 43.0**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	52		1.0	mg/Kg	☼	01/30/14 10:54	01/30/14 18:08	10
Copper	160		0.80	mg/Kg	☼	01/30/14 10:54	01/30/14 18:08	10
Zinc	380		4.0	mg/Kg	☼	01/30/14 10:54	01/30/14 18:08	10

Client Sample ID: SC-07(2-3) — **Lab Sample ID: 580-42028-28**
Date Collected: 01/21/14 14:13 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 72.2**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	27		0.58	mg/Kg	☼	01/30/14 10:54	01/30/14 18:13	10
Copper	98		0.47	mg/Kg	☼	01/30/14 10:54	01/30/14 18:13	10
Zinc	290		2.3	mg/Kg	☼	01/30/14 10:54	01/30/14 18:13	10

Client Sample ID: G-5(2-3) — **Lab Sample ID: 580-42028-34**
Date Collected: 01/21/14 14:52 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 85.5**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.4		0.51	mg/Kg	☼	01/30/14 10:54	01/30/14 18:18	10
Copper	2600		0.41	mg/Kg	☼	01/30/14 10:54	01/30/14 18:18	10
Zinc	8900		210	mg/Kg	☼	01/30/14 10:54	01/31/14 05:24	1000

Client Sample ID: G-5(4-5) — **Lab Sample ID: 580-42028-35**
Date Collected: 01/21/14 14:55 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 61.4**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	68		0.64	mg/Kg	☼	01/30/14 10:54	01/30/14 18:22	10
Copper	580		0.51	mg/Kg	☼	01/30/14 10:54	01/30/14 18:22	10
Zinc	1100		2.5	mg/Kg	☼	01/30/14 10:54	01/30/14 18:22	10

Method: 6020 - Metals (ICP/MS)

Client Sample ID: SC-05(1-2) — **Lab Sample ID: 580-42028-39**
Date Collected: 01/21/14 15:24 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 86.2**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.0		0.54	mg/Kg	☼	01/30/14 10:54	01/30/14 18:27	10
Copper	24		0.43	mg/Kg	☼	01/30/14 10:54	01/30/14 18:27	10
Zinc	44		2.1	mg/Kg	☼	01/30/14 10:54	01/30/14 18:27	10

Client Sample ID: SC-05(2-3) — **Lab Sample ID: 580-42028-40**
Date Collected: 01/21/14 15:26 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 87.3**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.9		0.56	mg/Kg	☼	01/30/14 10:54	01/30/14 18:32	10
Copper	17		0.45	mg/Kg	☼	01/30/14 10:54	01/30/14 18:32	10
Zinc	28		2.3	mg/Kg	☼	01/30/14 10:54	01/30/14 18:32	10

Client Sample ID: BSC-1(1-2) — **Lab Sample ID: 580-42028-46**
Date Collected: 01/21/14 16:00 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 78.1**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.3		0.57	mg/Kg	☼	01/30/14 10:54	01/30/14 18:46	10
Copper	19		0.46	mg/Kg	☼	01/30/14 10:54	01/30/14 18:46	10
Zinc	29		2.3	mg/Kg	☼	01/30/14 10:54	01/30/14 18:46	10

Client Sample ID: BSC-1(2-3) — **Lab Sample ID: 580-42028-47**
Date Collected: 01/21/14 16:02 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 80.7**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.0		0.53	mg/Kg	☼	01/30/14 10:54	01/30/14 18:51	10
Copper	16		0.42	mg/Kg	☼	01/30/14 10:54	01/30/14 18:51	10
Zinc	30		2.1	mg/Kg	☼	01/30/14 10:54	01/30/14 18:51	10

Client Sample ID: SC-DUP-1 — **Lab Sample ID: 580-42028-53**
Date Collected: 01/21/14 08:00 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 67.0**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.7		0.72	mg/Kg	☼	01/30/14 10:54	01/30/14 18:56	10
Copper	22		0.57	mg/Kg	☼	01/30/14 10:54	01/30/14 18:56	10
Zinc	42		2.9	mg/Kg	☼	01/30/14 10:54	01/30/14 18:56	10

Client Sample ID: SC-DUP-2 — **Lab Sample ID: 580-42028-54**
Date Collected: 01/21/14 08:01 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 53.4**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7.6		0.82	mg/Kg	☼	01/30/14 10:54	01/30/14 19:01	10
Copper	29		0.66	mg/Kg	☼	01/30/14 10:54	01/30/14 19:01	10
Zinc	37		3.3	mg/Kg	☼	01/30/14 10:54	01/30/14 19:01	10

Client Sample ID: SC-08(1-2) — **Lab Sample ID: 580-42028-56**
Date Collected: 01/21/14 16:30 — **Matrix: Solid**
Date Received: 01/22/14 17:21 — **Percent Solids: 65.2**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.4		0.65	mg/Kg	☼	01/30/14 10:54	01/30/14 19:06	10
Copper	23		0.52	mg/Kg	☼	01/30/14 10:54	01/30/14 19:06	10
Zinc	39		2.6	mg/Kg	☼	01/30/14 10:54	01/30/14 19:06	10

Client: Landau & Associates, Inc.
Project/Site: Can AM/ Tru Grit

TestAmerica Job ID: 580-42028-1

Method: 6020 - Metals (ICP/MS)

Client Sample ID: SC-08(2-3)
Date Collected: 01/21/14 16:35
Date Received: 01/22/14 17:21

Lab Sample ID: 580-42028-57
Matrix: Solid
Percent Solids: 54.7

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	5.2		0.88	mg/Kg	☼	01/30/14 10:54	01/30/14 19:11	10
Copper	29		0.71	mg/Kg	☼	01/30/14 10:54	01/30/14 19:11	10
Zinc	32		3.5	mg/Kg	☼	01/30/14 10:54	01/30/14 19:11	10

Client Sample ID: Chunk-1
Date Collected: 01/21/14 17:01
Date Received: 01/22/14 17:21

Lab Sample ID: 580-42028-63
Matrix: Solid
Percent Solids: 84.9

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	670		0.52	mg/Kg	☼	01/30/14 10:54	01/30/14 19:16	10
Copper	1400		0.42	mg/Kg	☼	01/30/14 10:54	01/30/14 19:16	10
Zinc	1800		2.1	mg/Kg	☼	01/30/14 10:54	01/30/14 19:16	10

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 580-152888/16-A
Matrix: Solid
Analysis Batch: 152963

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 152888

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	mg/Kg		01/29/14 17:26	01/30/14 13:02	10
Copper	ND		0.40	mg/Kg		01/29/14 17:26	01/30/14 13:02	10
Zinc	ND		2.0	mg/Kg		01/29/14 17:26	01/30/14 13:02	10

Lab Sample ID: LCS 580-152888/17-A
Matrix: Solid
Analysis Batch: 152963

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 152888

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	195		mg/Kg		97	80 - 120
Copper	25.0	24.6		mg/Kg		98	80 - 120
Zinc	50.0	48.6		mg/Kg		97	80 - 120

Lab Sample ID: LCSD 580-152888/18-A
Matrix: Solid
Analysis Batch: 152963

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 152888

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	195		mg/Kg		97	80 - 120	0	20
Copper	25.0	24.4		mg/Kg		98	80 - 120	1	20
Zinc	50.0	47.8		mg/Kg		96	80 - 120	2	20

Lab Sample ID: MB 580-152940/22-A
Matrix: Solid
Analysis Batch: 152988

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 152940

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.50	mg/Kg		01/30/14 10:54	01/30/14 16:56	10
Copper	ND		0.40	mg/Kg		01/30/14 10:54	01/30/14 16:56	10
Zinc	ND		2.0	mg/Kg		01/30/14 10:54	01/30/14 16:56	10

Lab Sample ID: LCS 580-152940/23-A
Matrix: Solid
Analysis Batch: 152988

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 152940

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	195		mg/Kg		97	80 - 120
Copper	25.0	24.2		mg/Kg		97	80 - 120
Zinc	50.0	48.7		mg/Kg		97	80 - 120

Lab Sample ID: LCSD 580-152940/24-A
Matrix: Solid
Analysis Batch: 152988

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 152940

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	194		mg/Kg		97	80 - 120	0	20
Copper	25.0	24.4		mg/Kg		98	80 - 120	1	20
Zinc	50.0	48.2		mg/Kg		96	80 - 120	1	20

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: 580-42028-13 MS — **Client Sample ID: SC-13(5-6)**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 152988 — **Prep Batch: 152940**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	56		321	368		mg/Kg	☼	97	80 - 120
Copper	48		40.1	88.5		mg/Kg	☼	101	80 - 120
Zinc	160		80.1	254	F1	mg/Kg	☼	121	80 - 120

Lab Sample ID: 580-42028-13 MSD — **Client Sample ID: SC-13(5-6)**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 152988 — **Prep Batch: 152940**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	56		303	462	F1 F2	mg/Kg	☼	134	80 - 120	22	20
Copper	48		37.9	124	F1 F2	mg/Kg	☼	199	80 - 120	33	20
Zinc	160		75.7	449	F1 F2	mg/Kg	☼	385	80 - 120	55	20

Lab Sample ID: 580-42028-13 DU — **Client Sample ID: SC-13(5-6)**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 152988 — **Prep Batch: 152940**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	56		64.5		mg/Kg	☼	14	20
Copper	48		54.9		mg/Kg	☼	13	20
Zinc	160		178		mg/Kg	☼	13	20

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Can AM/ Tru Grit

TestAmerica Job ID: 580-42028-1

Client Sample ID: SC-17(2-3)

Lab Sample ID: 580-42028-1
Date Collected: 01/21/14 09:48
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 84.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152888	01/29/14 17:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152963	01/30/14 14:24	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-17(3-4)

Lab Sample ID: 580-42028-2
Date Collected: 01/21/14 09:50
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 83.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152888	01/29/14 17:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152963	01/30/14 14:29	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-09(1-2)

Lab Sample ID: 580-42028-6
Date Collected: 01/21/14 10:28
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 84.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152888	01/29/14 17:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152963	01/30/14 14:34	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-09(2-3)

Lab Sample ID: 580-42028-7
Date Collected: 01/21/14 10:30
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 72.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152888	01/29/14 17:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152963	01/30/14 14:38	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-13(3-4)

Lab Sample ID: 580-42028-12
Date Collected: 01/21/14 11:15
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 81.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152888	01/29/14 17:26	PAB	TAL SEA
Total/NA	Analysis	6020		10	152963	01/30/14 14:43	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Can AM/ Tru Grit

TestAmerica Job ID: 580-42028-1

Client Sample ID: SC-13(5-6)

Lab Sample ID: 580-42028-13
Date Collected: 01/21/14 11:21
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 55.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 17:15	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-16(1-2)

Lab Sample ID: 580-42028-15
Date Collected: 01/21/14 12:34
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 70.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 17:49	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-16(2-3)

Lab Sample ID: 580-42028-16
Date Collected: 01/21/14 12:45
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 71.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 17:54	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-14(1-2)

Lab Sample ID: 580-42028-21
Date Collected: 01/21/14 13:18
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 70.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 17:58	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-14(2-3)

Lab Sample ID: 580-42028-22
Date Collected: 01/21/14 13:20
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 67.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 18:03	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-07(1-2)

Lab Sample ID: 580-42028-27

Date Collected: 01/21/14 14:10
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 43.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 18:08	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-07(2-3)

Lab Sample ID: 580-42028-28

Date Collected: 01/21/14 14:13
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 72.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 18:13	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: G-5(2-3)

Lab Sample ID: 580-42028-34

Date Collected: 01/21/14 14:52
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 85.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 18:18	FCW	TAL SEA
Total/NA	Analysis	6020		1000	152990	01/31/14 05:24	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: G-5(4-5)

Lab Sample ID: 580-42028-35

Date Collected: 01/21/14 14:55
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 61.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 18:22	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-05(1-2)

Lab Sample ID: 580-42028-39

Date Collected: 01/21/14 15:24
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 86.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 18:27	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Can AM/ Tru Grit

TestAmerica Job ID: 580-42028-1

Client Sample ID: SC-05(2-3)

Lab Sample ID: 580-42028-40
Date Collected: 01/21/14 15:26
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 87.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 18:32	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: BSC-1(1-2)

Lab Sample ID: 580-42028-46
Date Collected: 01/21/14 16:00
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 78.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 18:46	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: BSC-1(2-3)

Lab Sample ID: 580-42028-47
Date Collected: 01/21/14 16:02
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 80.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 18:51	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-DUP-1

Lab Sample ID: 580-42028-53
Date Collected: 01/21/14 08:00
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 67.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 18:56	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-DUP-2

Lab Sample ID: 580-42028-54
Date Collected: 01/21/14 08:01
Matrix: Solid
Date Received: 01/22/14 17:21
Percent Solids: 53.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 19:01	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Can AM/ Tru Grit

TestAmerica Job ID: 580-42028-1

Client Sample ID: SC-08(1-2)

Lab Sample ID: 580-42028-56

Date Collected: 01/21/14 16:30
Date Received: 01/22/14 17:21

Matrix: Solid
Percent Solids: 65.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 19:06	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: SC-08(2-3)

Lab Sample ID: 580-42028-57

Date Collected: 01/21/14 16:35
Date Received: 01/22/14 17:21

Matrix: Solid
Percent Solids: 54.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 19:11	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Client Sample ID: Chunk-1

Lab Sample ID: 580-42028-63

Date Collected: 01/21/14 17:01
Date Received: 01/22/14 17:21

Matrix: Solid
Percent Solids: 84.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			152940	01/30/14 10:54	PAB	TAL SEA
Total/NA	Analysis	6020		10	152988	01/30/14 19:16	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	152637	01/24/14 12:44	SGH	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Certification Summary

Client: Landau & Associates, Inc.
Project/Site: Can AM/ Tru Grit

TestAmerica Job ID: 580-42028-1

Laboratory: TestAmerica Seattle

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C553	02-17-14

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-74664-1
Client Project/Site: Tru Grit
Revision: 2

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Authorized for release by:
4/24/2018 12:35:44 PM

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 580-74664-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-74664-1

Comments
Revised on 2/15/18 to change units to "% by dry wt" and to only report TOC average.
Revised on 4/24/18 to change grain size to 3 sig figs for rounding clarification for sample 1.

Receipt
The samples were received on 1/25/2018 3:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.4° C.

GC/MS Semi VOA
Method(s) 8270D: The continuing calibration verification (CCV) associated with batch 580-266728 recovered above the upper control limit for Hexachlorobenzene, 2-Methylphenol, 1,2,4-Trichlorobenzene, 2,4-Dimethylphenol and Hexachlorobutadiene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: G-5-012518 (580-74664-1), SG-14-012518 (580-74664-2), SG-16-012518 (580-74664-3), SG-17-012518 (580-74664-4), DUP-1-012518 (580-74664-5) and (CCVIS 580-266728/3).

Method(s) 8270D: The following analyte recovered outside control limits for the LCS associated with preparation batch 580-266639 and analytical batch 580-266728: 2,4-Dimethylphenol. This is not indicative of a systematic control problem because this was a random marginal exceedance. Qualified results have been reported.

Method(s) 8270D: The continuing calibration verification (CCV) associated with batch 580-267064 recovered outside acceptance criteria, low biased, for Benzyl alcohol. Since the CCV is spiked at a level below the reporting limit for this analyte, and the target analyte was detected, and the associated samples were non-detect for this analyte; the data is qualified and reported.

Method(s) 8270D: The following analyte recovered outside control limits for the LCS associated with preparation batch 580-266639 and analytical batch 580-267064: Benzyl Alcohol. This is not indicative of a systematic control problem because this was a random marginal exceedance. Qualified results have been reported.

Method(s) 8270D: The following samples and batch QC were re-analyzed due to failing CCV criteria in the initial analysis: G-5-012518 (580-74664-1), SG-14-012518 (580-74664-2), SG-16-012518 (580-74664-3), SG-17-012518 (580-74664-4), DUP-1-012518 (580-74664-5), (580-74664-1 MS) and (580-74664-1 MSD)

Method(s) 8270D: Surrogate Terphenyl-d14 recovery for the following sample was outside control limits: SG-17-012518 (580-74664-4). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Method(s) 8082A: The continuing calibration verification (CCV) associated with 580-266785 recovered outside the control limits for PCB-1221 and PCB-1254 on one column. Results are confirmed on both columns and reported from the passing column. The following sample is impacted: (CCV 580-266785/11).

Method(s) 8082A: Surrogate Tetrachloro-m-xylene recovery for the following samples were outside control limits: 580-74664-A-5-D MS. Surrogate DCB Decachlorobiphenyl recovered within range and evidence of matrix interference is present via sulfur and baseline; therefore, re-extraction and/or re-analysis was not performed.

Method(s) 8082A: The following samples required a copper clean-up to reduce matrix interferences caused by sulfur: G-5-012518 (580-74664-1), SG-14-012518 (580-74664-2), SG-16-012518 (580-74664-3), SG-17-012518 (580-74664-4), DUP-1-012518 (580-74664-5), (580-74664-5 MS) and (580-74664-5 MSD).

Method(s) 8082A: The following sample(s) contained more than one Aroclor with insufficient separation to quantify individually. The PCBs present are quantified as the predominant Aroclor: G-5-012518 (580-74664-1), SG-14-012518 (580-74664-2), SG-16-012518 (580-74664-3), SG-17-012518 (580-74664-4), DUP-1-012518 (580-74664-5), (580-74664-5 MS) and (580-74664-5 MSD).

Job ID: 580-74664-1 (Continued)

Laboratory: TestAmerica Seattle (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Geotechnical
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
*	LCS or LCSD is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
E	Result exceeded calibration range.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
X	Surrogate is outside control limits

GC Semi VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
F1	MS and/or MSD Recovery is outside acceptance limits.
X	Surrogate is outside control limits

Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: Tru Grit

TestAmerica Job ID: 580-74664-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-74664-1	G-5-012518	Solid	01/25/18 11:15	01/25/18 15:15
580-74664-2	SG-14-012518	Solid	01/25/18 09:30	01/25/18 15:15
580-74664-3	SG-16-012518	Solid	01/25/18 10:10	01/25/18 15:15
580-74664-4	SG-17-012518	Solid	01/25/18 10:40	01/25/18 15:15
580-74664-5	DUP-1-012518	Solid	01/25/18 10:15	01/25/18 15:15

LANDAU ASSOCIATES

☒ **Seattle/Edmonds** (425) 778-0907
☐ **Tacoma** (253) 926-2493
☐ **Spokane** (509) 327-9737
☐ **Portland** (503) 542-1080
☐ _____

Chain-of-Custody Record

SMS sediment

Loc: 580
74664

Date 1/25/18
Page 1 of 1

Project Name Tru Grit Project No. 241008.020
Project Location/Event Tacoma, WA / Bioassay
Sampler's Name Devan Brandt
Project Contact Jennifer Wynkoop
Send Results To " " &Dani Jorgenson

Testing Parameters

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Sample I.D.	Date	Time	Matrix	No. of Containers	SMS Metals * 6020A LL	SMS Mercury - 7471A	SMS PCBs - 8082A LL	SMS SVOCs - 8270D LL	SMS TOC - 9060 PSEP	Grain Size - PLUMB 1981	~~ARCHIVE~~ D53
G-5-012518	1/25/18	1115	SED	3	X	X	X	X	X	X	
SG-14-012518		0930		3	X	X	X	X	X	X	
SG-16-012518		1010		3	X	X	X	X	X	X	
SG-17-012518		1040		3	X	X	X	X	X	X	
DUP-1-012518		1015		32	X	X	X	X	X	R	D53

580-74664 Chain of Custody

Therm. ID A-2 Cor 5.4 Unc 0.3
Cooler Dsc Lrg Blue @Lab
Wet/Packs Packing Bub
Cl: do Custody Seal: Yes ___ No ✓

Observations/Comments

☒ Allow water samples to settle, collect aliquot from clear portion
☐ NWTPH-Dx - run acid wash silica gel cleanup
☐ Analyze for EPH if no specific product identified
VOC/BTEX/VPH (soil):
☐ non-preserved
☐ preserved w/methanol
☐ preserved w/sodium bisulfate
☐ Freeze upon receipt
☐ Dissolved metal water samples field filtered
Other * As, Cd, Cr, Cu, Pb, Ni, Ag, Zn

Special Shipment/Handling or Storage Requirements: Retain GSA Analysis Fractions & Return to LAI

Method of Shipment:

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature B. Gail	Signature	Signature
Printed Name Devan Brandt	Printed Name B. Gail	Printed Name	Printed Name
Company LAI	Company SEA TR	Company	Company
Date 1/25/18 Time 1515	Date 1/25/18 Time 1515	Date Time	Date Time

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

4/24/2018 (Rev. 2)

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-74664-1

Login Number: 74664
List Number: 1
Creator: Gall, Brandon A

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Client Sample ID: G-5-012518
Date Collected: 01/25/18 11:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-1
Matrix: Solid
Percent Solids: 61.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		8.0	8.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
1,2-Dichlorobenzene	ND	F1	8.0	8.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
1,4-Dichlorobenzene	ND	F1	8.0	8.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
2,4-Dimethylphenol	ND	*	16	16	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
2-Methylnaphthalene	ND		8.0	8.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
2-Methylphenol	ND		24	24	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
3 & 4 Methylphenol	ND	F1	32	32	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Acenaphthene	**16**	**F1**	4.0	4.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Acenaphthylene	**14**		4.0	4.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Anthracene	**46**	**F1 F2**	4.0	4.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Benzo[a]anthracene	**270**	**F1 F2**	4.0	4.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Benzo[a]pyrene	**150**	**F1 F2**	9.6	9.6	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Benzo[g,h,i]perylene	**41**	**F1 F2**	9.6	9.6	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Benzofluoranthene	**370**	**F1 F2**	24	24	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Bis(2-ethylhexyl) phthalate	ND	F2	96	96	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Butyl benzyl phthalate	ND		32	32	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Carbazole	ND	F2	24	24	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Dibenz(a,h)anthracene	**14**	**F1 F2**	8.0	8.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Dibenzofuran	ND	F1	24	24	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Diethyl phthalate	ND		88	88	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Dimethyl phthalate	ND		24	24	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Di-n-butyl phthalate	ND		80	80	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Di-n-octyl phthalate	ND	F1	160	160	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Fluorene	**20**		4.0	4.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Hexachlorobenzene	ND		8.0	8.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Hexachlorobutadiene	ND	F1	8.0	8.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Indeno[1,2,3-cd]pyrene	**51**	**F1 F2**	6.4	6.4	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Naphthalene	**6.4**	**F1**	4.0	4.0	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
N-Nitrosodiphenylamine	ND	F1	9.6	9.6	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Pentachlorophenol	ND		64	64	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Phenanthrene	**85**	**F1 F2**	9.6	9.6	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1
Phenol	ND		24	24	ug/Kg	☼	02/05/18 09:02	02/06/18 18:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*77*		*57 - 110*	*02/05/18 09:02*	*02/06/18 18:51*	*1*
2-Fluorophenol	*71*		*36 - 125*	*02/05/18 09:02*	*02/06/18 18:51*	*1*
Nitrobenzene-d5	*78*		*54 - 113*	*02/05/18 09:02*	*02/06/18 18:51*	*1*
Phenol-d5	*71*		*59 - 113*	*02/05/18 09:02*	*02/06/18 18:51*	*1*

Client Sample ID: SG-14-012518
Date Collected: 01/25/18 09:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-2
Matrix: Solid
Percent Solids: 68.3

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		7.2	7.2	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
1,2-Dichlorobenzene	ND		7.2	7.2	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
1,4-Dichlorobenzene	ND		7.2	7.2	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
2,4-Dimethylphenol	ND	*	14	14	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
2-Methylnaphthalene	ND		7.2	7.2	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
2-Methylphenol	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
3 & 4 Methylphenol	ND		29	29	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: SG-14-012518
Date Collected: 01/25/18 09:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-2
Matrix: Solid
Percent Solids: 68.3

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**5.9**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Acenaphthylene	**5.4**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Anthracene	**22**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Benzo[a]anthracene	**62**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Benzo[a]pyrene	**67**		8.7	8.7	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Benzo[g,h,i]perylene	**19**		8.7	8.7	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Benzofluoranthene	**160**		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Bis(2-ethylhexyl) phthalate	ND		87	87	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Butyl benzyl phthalate	ND		29	29	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Carbazole	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Dibenz(a,h)anthracene	ND		7.2	7.2	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Dibenzofuran	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Diethyl phthalate	ND		79	79	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Dimethyl phthalate	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Di-n-butyl phthalate	ND		72	72	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Di-n-octyl phthalate	ND		140	140	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Fluorene	**7.9**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Hexachlorobenzene	ND		7.2	7.2	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Hexachlorobutadiene	ND		7.2	7.2	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Indeno[1,2,3-cd]pyrene	**22**		5.8	5.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Naphthalene	**5.9**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
N-Nitrosodiphenylamine	ND		8.7	8.7	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Pentachlorophenol	ND		58	58	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Phenanthrene	**44**		8.7	8.7	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1
Phenol	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*67*		*57 - 110*	*02/05/18 09:02*	*02/06/18 20:05*	*1*
2-Fluorophenol	*67*		*36 - 125*	*02/05/18 09:02*	*02/06/18 20:05*	*1*
Nitrobenzene-d5	*68*		*54 - 113*	*02/05/18 09:02*	*02/06/18 20:05*	*1*
Phenol-d5	*62*		*59 - 113*	*02/05/18 09:02*	*02/06/18 20:05*	*1*

Client Sample ID: SG-16-012518
Date Collected: 01/25/18 10:10
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-3
Matrix: Solid
Percent Solids: 65.8

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		7.3	7.3	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
1,2-Dichlorobenzene	ND		7.3	7.3	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
1,4-Dichlorobenzene	ND		7.3	7.3	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
2,4-Dimethylphenol	ND	*	15	15	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
2-Methylnaphthalene	ND		7.3	7.3	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
2-Methylphenol	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
3 & 4 Methylphenol	ND		29	29	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Acenaphthene	**3.6**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Acenaphthylene	**4.2**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Anthracene	**15**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Benzo[a]anthracene	**41**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Benzo[a]pyrene	**42**		8.8	8.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Benzo[g,h,i]perylene	**10**		8.8	8.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Benzofluoranthene	**100**		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: SG-16-012518
Date Collected: 01/25/18 10:10
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-3
Matrix: Solid
Percent Solids: 65.8

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		88	88	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Butyl benzyl phthalate	ND		29	29	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Carbazole	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Dibenz(a,h)anthracene	ND		7.3	7.3	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Dibenzofuran	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Diethyl phthalate	ND		80	80	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Dimethyl phthalate	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Di-n-butyl phthalate	ND		73	73	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Di-n-octyl phthalate	ND		150	150	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Fluorene	**5.1**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Hexachlorobenzene	ND		7.3	7.3	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Hexachlorobutadiene	ND		7.3	7.3	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Indeno[1,2,3-cd]pyrene	**13**		5.8	5.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Naphthalene	**5.9**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
N-Nitrosodiphenylamine	ND		8.8	8.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Pentachlorophenol	ND		58	58	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Phenanthrene	**38**		8.8	8.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1
Phenol	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 20:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*64*		*57 - 110*	*02/05/18 09:02*	*02/06/18 20:30*	*1*
2-Fluorophenol	*73*		*36 - 125*	*02/05/18 09:02*	*02/06/18 20:30*	*1*
Nitrobenzene-d5	*76*		*54 - 113*	*02/05/18 09:02*	*02/06/18 20:30*	*1*
Phenol-d5	*61*		*59 - 113*	*02/05/18 09:02*	*02/06/18 20:30*	*1*

Client Sample ID: SG-17-012518
Date Collected: 01/25/18 10:40
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-4
Matrix: Solid
Percent Solids: 63.9

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		7.5	7.5	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
1,2-Dichlorobenzene	ND		7.5	7.5	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
1,4-Dichlorobenzene	ND		7.5	7.5	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
2,4-Dimethylphenol	ND	*	15	15	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
2-Methylnaphthalene	ND		7.5	7.5	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
2-Methylphenol	ND		23	23	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
3 & 4 Methylphenol	ND		30	30	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Acenaphthene	**4.2**		3.8	3.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Acenaphthylene	**4.1**		3.8	3.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Anthracene	**15**		3.8	3.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Benzo[a]anthracene	**39**		3.8	3.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Benzo[a]pyrene	**40**		9.0	9.0	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Benzo[g,h,i]perylene	**9.0**		9.0	9.0	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Benzofluoranthene	**100**		23	23	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Bis(2-ethylhexyl) phthalate	ND		90	90	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Butyl benzyl phthalate	ND		30	30	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Carbazole	ND		23	23	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Dibenz(a,h)anthracene	ND		7.5	7.5	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Dibenzofuran	ND		23	23	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Diethyl phthalate	ND		83	83	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Dimethyl phthalate	ND		23	23	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: SG-17-012518
Date Collected: 01/25/18 10:40
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-4
Matrix: Solid
Percent Solids: 63.9

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Di-n-butyl phthalate	ND		75	75	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Di-n-octyl phthalate	ND		150	150	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Fluorene	**5.5**		3.8	3.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Hexachlorobenzene	ND		7.5	7.5	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Hexachlorobutadiene	ND		7.5	7.5	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Indeno[1,2,3-cd]pyrene	**13**		6.0	6.0	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Naphthalene	**4.6**		3.8	3.8	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
N-Nitrosodiphenylamine	ND		9.0	9.0	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Pentachlorophenol	ND		60	60	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Phenanthrene	**28**		9.0	9.0	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1
Phenol	ND		23	23	ug/Kg	☼	02/05/18 09:02	02/06/18 20:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*72*		*57 - 110*	*02/05/18 09:02*	*02/06/18 20:54*	*1*
2-Fluorophenol	*62*		*36 - 125*	*02/05/18 09:02*	*02/06/18 20:54*	*1*
Nitrobenzene-d5	*73*		*54 - 113*	*02/05/18 09:02*	*02/06/18 20:54*	*1*
Phenol-d5	*60*		*59 - 113*	*02/05/18 09:02*	*02/06/18 20:54*	*1*

Client Sample ID: DUP-1-012518
Date Collected: 01/25/18 10:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-5
Matrix: Solid
Percent Solids: 65.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		7.4	7.4	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
1,2-Dichlorobenzene	ND		7.4	7.4	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
1,4-Dichlorobenzene	ND		7.4	7.4	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
2,4-Dimethylphenol	ND	*	15	15	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
2-Methylnaphthalene	ND		7.4	7.4	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
2-Methylphenol	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
3 & 4 Methylphenol	ND		30	30	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Acenaphthene	**4.0**		3.7	3.7	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Acenaphthylene	**4.5**		3.7	3.7	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Anthracene	**37**		3.7	3.7	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Benzo[a]anthracene	**49**		3.7	3.7	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Benzo[a]pyrene	**50**		8.9	8.9	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Benzo[g,h,i]perylene	**13**		8.9	8.9	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Benzofluoranthene	**120**		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Bis(2-ethylhexyl) phthalate	ND		89	89	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Butyl benzyl phthalate	ND		30	30	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Carbazole	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Dibenz(a,h)anthracene	ND		7.4	7.4	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Dibenzofuran	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Diethyl phthalate	ND		82	82	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Dimethyl phthalate	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Di-n-butyl phthalate	ND		74	74	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Di-n-octyl phthalate	ND		150	150	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Fluorene	**19**		3.7	3.7	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Hexachlorobenzene	ND		7.4	7.4	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Hexachlorobutadiene	ND		7.4	7.4	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Indeno[1,2,3-cd]pyrene	**16**		5.9	5.9	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Naphthalene	**6.5**		3.7	3.7	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Client Sample ID: DUP-1-012518
Date Collected: 01/25/18 10:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-5
Matrix: Solid
Percent Solids: 65.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
N-Nitrosodiphenylamine	ND		8.9	8.9	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Pentachlorophenol	ND		59	59	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Phenanthrene	**54**		8.9	8.9	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1
Phenol	ND		22	22	ug/Kg	☼	02/05/18 09:02	02/06/18 21:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*67*		*57 - 110*	*02/05/18 09:02*	*02/06/18 21:19*	*1*
2-Fluorophenol	*85*		*36 - 125*	*02/05/18 09:02*	*02/06/18 21:19*	*1*
Nitrobenzene-d5	*80*		*54 - 113*	*02/05/18 09:02*	*02/06/18 21:19*	*1*
Phenol-d5	*94*		*59 - 113*	*02/05/18 09:02*	*02/06/18 21:19*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RA

Client Sample ID: G-5-012518
Date Collected: 01/25/18 11:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-1
Matrix: Solid
Percent Solids: 61.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzoic acid	ND		400	400	ug/Kg	☼	02/05/18 09:02	02/09/18 22:20	1
Benzyl alcohol	ND	*	640	640	ug/Kg	☼	02/05/18 09:02	02/09/18 22:20	1
Chrysene	**400**	**F2 F1**	9.6	9.6	ug/Kg	☼	02/05/18 09:02	02/09/18 22:20	1
Fluoranthene	**650**	**F2**	4.0	4.0	ug/Kg	☼	02/05/18 09:02	02/09/18 22:20	1
Pyrene	**490**	**F2 F1**	9.6	9.6	ug/Kg	☼	02/05/18 09:02	02/09/18 22:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*74*		*10 - 126*	*02/05/18 09:02*	*02/09/18 22:20*	*1*
Terphenyl-d14	*73*		*68 - 120*	*02/05/18 09:02*	*02/09/18 22:20*	*1*

Client Sample ID: SG-14-012518
Date Collected: 01/25/18 09:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-2
Matrix: Solid
Percent Solids: 68.3

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzoic acid	ND		360	360	ug/Kg	☼	02/05/18 09:02	02/10/18 00:49	1
Benzyl alcohol	ND	*	580	580	ug/Kg	☼	02/05/18 09:02	02/10/18 00:49	1
Chrysene	**110**		8.7	8.7	ug/Kg	☼	02/05/18 09:02	02/10/18 00:49	1
Fluoranthene	**150**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/10/18 00:49	1
Pyrene	**180**		8.7	8.7	ug/Kg	☼	02/05/18 09:02	02/10/18 00:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*70*		*10 - 126*	*02/05/18 09:02*	*02/10/18 00:49*	*1*
Terphenyl-d14	*71*		*68 - 120*	*02/05/18 09:02*	*02/10/18 00:49*	*1*

Client Sample ID: SG-16-012518
Date Collected: 01/25/18 10:10
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-3
Matrix: Solid
Percent Solids: 65.8

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzoic acid	ND		360	360	ug/Kg	☼	02/05/18 09:02	02/10/18 01:13	1
Benzyl alcohol	ND	*	580	580	ug/Kg	☼	02/05/18 09:02	02/10/18 01:13	1
Chrysene	**83**		8.8	8.8	ug/Kg	☼	02/05/18 09:02	02/10/18 01:13	1
Fluoranthene	**140**		3.6	3.6	ug/Kg	☼	02/05/18 09:02	02/10/18 01:13	1
Pyrene	**130**		8.8	8.8	ug/Kg	☼	02/05/18 09:02	02/10/18 01:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*74*		*10 - 126*	*02/05/18 09:02*	*02/10/18 01:13*	*1*
Terphenyl-d14	*73*		*68 - 120*	*02/05/18 09:02*	*02/10/18 01:13*	*1*

Client Sample ID: SG-17-012518
Date Collected: 01/25/18 10:40
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-4
Matrix: Solid
Percent Solids: 63.9

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzoic acid	ND		380	380	ug/Kg	☼	02/05/18 09:02	02/10/18 01:38	1
Benzyl alcohol	ND	*	600	600	ug/Kg	☼	02/05/18 09:02	02/10/18 01:38	1
Chrysene	**55**		9.0	9.0	ug/Kg	☼	02/05/18 09:02	02/10/18 01:38	1
Fluoranthene	**96**		3.8	3.8	ug/Kg	☼	02/05/18 09:02	02/10/18 01:38	1
Pyrene	**91**		9.0	9.0	ug/Kg	☼	02/05/18 09:02	02/10/18 01:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*62*		*10 - 126*	*02/05/18 09:02*	*02/10/18 01:38*	*1*
Terphenyl-d14	*64*	*X*	*68 - 120*	*02/05/18 09:02*	*02/10/18 01:38*	*1*

Client: Landau & Associates, Inc.
Project/Site: Tru Grit

TestAmerica Job ID: 580-74664-1

Client Sample ID: DUP-1-012518
Date Collected: 01/25/18 10:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-5
Matrix: Solid
Percent Solids: 65.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzoic acid	ND		370	370	ug/Kg	☼	02/05/18 09:02	02/10/18 02:02	1
Benzyl alcohol	ND	*	590	590	ug/Kg	☼	02/05/18 09:02	02/10/18 02:02	1
Chrysene	**76**		8.9	8.9	ug/Kg	☼	02/05/18 09:02	02/10/18 02:02	1
Fluoranthene	**110**		3.7	3.7	ug/Kg	☼	02/05/18 09:02	02/10/18 02:02	1
Pyrene	**120**		8.9	8.9	ug/Kg	☼	02/05/18 09:02	02/10/18 02:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*71*		*10 - 126*	*02/05/18 09:02*	*02/10/18 02:02*	*1*
Terphenyl-d14	*77*		*68 - 120*	*02/05/18 09:02*	*02/10/18 02:02*	*1*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Client Sample ID: G-5-012518
Date Collected: 01/25/18 11:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-1
Matrix: Solid
Percent Solids: 61.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND	*	1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 20:46	1
PCB-1221	ND		1.8	1.8	ug/Kg	☼	02/06/18 09:24	02/08/18 20:46	1
PCB-1232	ND		1.8	1.8	ug/Kg	☼	02/06/18 09:24	02/08/18 20:46	1
PCB-1242	ND		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 20:46	1
PCB-1248	ND		1.8	1.8	ug/Kg	☼	02/06/18 09:24	02/08/18 20:46	1
PCB-1254	**11**		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 20:46	1
PCB-1260	ND		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 20:46	1
Polychlorinated biphenyls, Total	**11**		1.8	1.8	ug/Kg	☼	02/06/18 09:24	02/08/18 20:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*91*		*25 - 149*	*02/06/18 09:24*	*02/08/18 20:46*	*1*
Tetrachloro-m-xylene	*55*		*35 - 130*	*02/06/18 09:24*	*02/08/18 20:46*	*1*

Client Sample ID: SG-14-012518
Date Collected: 01/25/18 09:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-2
Matrix: Solid
Percent Solids: 68.3

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND	*	1.4	1.4	ug/Kg	☼	02/06/18 09:24	02/08/18 21:03	1
PCB-1221	ND		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:03	1
PCB-1232	ND		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:03	1
PCB-1242	ND		1.4	1.4	ug/Kg	☼	02/06/18 09:24	02/08/18 21:03	1
PCB-1248	ND		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:03	1
PCB-1254	**4.8**		1.4	1.4	ug/Kg	☼	02/06/18 09:24	02/08/18 21:03	1
PCB-1260	ND		1.4	1.4	ug/Kg	☼	02/06/18 09:24	02/08/18 21:03	1
Polychlorinated biphenyls, Total	**4.8**		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*90*		*25 - 149*	*02/06/18 09:24*	*02/08/18 21:03*	*1*
Tetrachloro-m-xylene	*45*		*35 - 130*	*02/06/18 09:24*	*02/08/18 21:03*	*1*

Client Sample ID: SG-16-012518
Date Collected: 01/25/18 10:10
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-3
Matrix: Solid
Percent Solids: 65.8

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND	*	1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:19	1
PCB-1221	ND		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:19	1
PCB-1232	ND		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:19	1
PCB-1242	ND		1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:19	1
PCB-1248	ND		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:19	1
PCB-1254	**3.0**		1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:19	1
PCB-1260	ND		1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:19	1
Polychlorinated biphenyls, Total	**3.0**		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*97*		*25 - 149*	*02/06/18 09:24*	*02/08/18 21:19*	*1*
Tetrachloro-m-xylene	*61*		*35 - 130*	*02/06/18 09:24*	*02/08/18 21:19*	*1*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Client Sample ID: SG-17-012518
Date Collected: 01/25/18 10:40
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-4
Matrix: Solid
Percent Solids: 63.9

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND	*	1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:36	1
PCB-1221	ND		1.7	1.7	ug/Kg	☼	02/06/18 09:24	02/08/18 21:36	1
PCB-1232	ND		1.7	1.7	ug/Kg	☼	02/06/18 09:24	02/08/18 21:36	1
PCB-1242	ND		1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:36	1
PCB-1248	ND		1.7	1.7	ug/Kg	☼	02/06/18 09:24	02/08/18 21:36	1
PCB-1254	**19**		1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:36	1
PCB-1260	ND		1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:36	1
Polychlorinated biphenyls, Total	**19**		1.7	1.7	ug/Kg	☼	02/06/18 09:24	02/08/18 21:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*75*		*25 - 149*	*02/06/18 09:24*	*02/08/18 21:36*	*1*
Tetrachloro-m-xylene	*54*		*35 - 130*	*02/06/18 09:24*	*02/08/18 21:36*	*1*

Client Sample ID: DUP-1-012518
Date Collected: 01/25/18 10:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-5
Matrix: Solid
Percent Solids: 65.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND	F2 *	1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:53	1
PCB-1221	ND		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:53	1
PCB-1232	ND		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:53	1
PCB-1242	ND		1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:53	1
PCB-1248	ND		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:53	1
PCB-1254	**16**		1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:53	1
PCB-1260	ND	F2 F1	1.5	1.5	ug/Kg	☼	02/06/18 09:24	02/08/18 21:53	1
Polychlorinated biphenyls, Total	**16**		1.6	1.6	ug/Kg	☼	02/06/18 09:24	02/08/18 21:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*90*		*25 - 149*	*02/06/18 09:24*	*02/08/18 21:53*	*1*
Tetrachloro-m-xylene	*36*		*35 - 130*	*02/06/18 09:24*	*02/08/18 21:53*	*1*

Method: 6020A - Metals (ICP/MS)

Client Sample ID: G-5-012518
Date Collected: 01/25/18 11:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-1
Matrix: Solid
Percent Solids: 61.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	11		0.25	0.25	mg/Kg	☼	02/06/18 09:45	02/06/18 14:23	5
Cadmium	0.33		0.20	0.20	mg/Kg	☼	02/06/18 09:45	02/06/18 14:23	5
Chromium	38		0.25	0.25	mg/Kg	☼	02/06/18 09:45	02/06/18 14:23	5
Copper	120		0.50	0.50	mg/Kg	☼	02/06/18 09:45	02/06/18 14:23	5
Lead	16		0.25	0.25	mg/Kg	☼	02/06/18 09:45	02/06/18 14:23	5
Nickel	11		0.25	0.25	mg/Kg	☼	02/06/18 09:45	02/06/18 14:23	5
Silver	0.18		0.10	0.10	mg/Kg	☼	02/06/18 09:45	02/06/18 14:23	5
Zinc	390		2.5	2.5	mg/Kg	☼	02/06/18 09:45	02/06/18 14:23	5

Client Sample ID: SG-14-012518
Date Collected: 01/25/18 09:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-2
Matrix: Solid
Percent Solids: 68.3

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.5		0.28	0.28	mg/Kg	☼	02/06/18 09:45	02/06/18 13:32	5
Cadmium	ND		0.23	0.23	mg/Kg	☼	02/06/18 09:45	02/06/18 13:32	5
Chromium	17	F1	0.28	0.28	mg/Kg	☼	02/06/18 09:45	02/06/18 13:32	5
Copper	43	F1	0.57	0.57	mg/Kg	☼	02/06/18 09:45	02/06/18 13:32	5
Lead	13		0.28	0.28	mg/Kg	☼	02/06/18 09:45	02/06/18 13:32	5
Nickel	11		0.28	0.28	mg/Kg	☼	02/06/18 09:45	02/06/18 13:32	5
Silver	ND		0.11	0.11	mg/Kg	☼	02/06/18 09:45	02/06/18 13:32	5
Zinc	77		2.8	2.8	mg/Kg	☼	02/06/18 09:45	02/06/18 13:32	5

Client Sample ID: SG-16-012518
Date Collected: 01/25/18 10:10
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-3
Matrix: Solid
Percent Solids: 65.8

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	14		0.30	0.30	mg/Kg	☼	02/06/18 09:45	02/06/18 14:11	5
Cadmium	ND		0.24	0.24	mg/Kg	☼	02/06/18 09:45	02/06/18 14:11	5
Chromium	18		0.30	0.30	mg/Kg	☼	02/06/18 09:45	02/06/18 14:11	5
Copper	75		0.60	0.60	mg/Kg	☼	02/06/18 09:45	02/06/18 14:11	5
Lead	16		0.30	0.30	mg/Kg	☼	02/06/18 09:45	02/06/18 14:11	5
Nickel	11		0.30	0.30	mg/Kg	☼	02/06/18 09:45	02/06/18 14:11	5
Silver	0.13		0.12	0.12	mg/Kg	☼	02/06/18 09:45	02/06/18 14:11	5
Zinc	150		3.0	3.0	mg/Kg	☼	02/06/18 09:45	02/06/18 14:11	5

Client Sample ID: SG-17-012518
Date Collected: 01/25/18 10:40
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-4
Matrix: Solid
Percent Solids: 63.9

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	81		0.27	0.27	mg/Kg	☼	02/06/18 09:45	02/06/18 14:15	5
Cadmium	0.23		0.22	0.22	mg/Kg	☼	02/06/18 09:45	02/06/18 14:15	5
Chromium	25		0.27	0.27	mg/Kg	☼	02/06/18 09:45	02/06/18 14:15	5
Copper	97		0.54	0.54	mg/Kg	☼	02/06/18 09:45	02/06/18 14:15	5
Lead	55		0.27	0.27	mg/Kg	☼	02/06/18 09:45	02/06/18 14:15	5
Nickel	15		0.27	0.27	mg/Kg	☼	02/06/18 09:45	02/06/18 14:15	5
Silver	0.21		0.11	0.11	mg/Kg	☼	02/06/18 09:45	02/06/18 14:15	5
Zinc	240		2.7	2.7	mg/Kg	☼	02/06/18 09:45	02/06/18 14:15	5

Client: Landau & Associates, Inc.
Project/Site: Tru Grit

TestAmerica Job ID: 580-74664-1

Method: 6020A - Metals (ICP/MS)

Client Sample ID: DUP-1-012518
Date Collected: 01/25/18 10:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-5
Matrix: Solid
Percent Solids: 65.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	70		0.29	0.29	mg/Kg	☼	02/06/18 09:45	02/06/18 14:19	5
Cadmium	0.24		0.23	0.23	mg/Kg	☼	02/06/18 09:45	02/06/18 14:19	5
Chromium	23		0.29	0.29	mg/Kg	☼	02/06/18 09:45	02/06/18 14:19	5
Copper	110		0.58	0.58	mg/Kg	☼	02/06/18 09:45	02/06/18 14:19	5
Lead	59		0.29	0.29	mg/Kg	☼	02/06/18 09:45	02/06/18 14:19	5
Nickel	16		0.29	0.29	mg/Kg	☼	02/06/18 09:45	02/06/18 14:19	5
Silver	0.20		0.12	0.12	mg/Kg	☼	02/06/18 09:45	02/06/18 14:19	5
Zinc	250		2.9	2.9	mg/Kg	☼	02/06/18 09:45	02/06/18 14:19	5

Client: Landau & Associates, Inc.
Project/Site: Tru Grit

TestAmerica Job ID: 580-74664-1

Method: 7471A - Mercury (CVAA)

Client Sample ID: G-5-012518
Date Collected: 01/25/18 11:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-1
Matrix: Solid
Percent Solids: 61.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.048		0.038	0.038	mg/Kg	☼	02/01/18 10:22	02/01/18 12:19	1

Client Sample ID: SG-14-012518
Date Collected: 01/25/18 09:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-2
Matrix: Solid
Percent Solids: 68.3

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.045		0.030	0.030	mg/Kg	☼	02/01/18 10:22	02/01/18 12:28	1

Client Sample ID: SG-16-012518
Date Collected: 01/25/18 10:10
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-3
Matrix: Solid
Percent Solids: 65.8

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.050		0.038	0.038	mg/Kg	☼	02/01/18 10:22	02/01/18 12:30	1

Client Sample ID: SG-17-012518
Date Collected: 01/25/18 10:40
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-4
Matrix: Solid
Percent Solids: 63.9

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.041	0.041	mg/Kg	☼	02/01/18 10:22	02/01/18 12:33	1

Client Sample ID: DUP-1-012518
Date Collected: 01/25/18 10:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-5
Matrix: Solid
Percent Solids: 65.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.11		0.040	0.040	mg/Kg	☼	02/01/18 10:22	02/01/18 12:40	1

General Chemistry

Client Sample ID: G-5-012518
Date Collected: 01/25/18 11:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-1
Matrix: Solid
Percent Solids: 61.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	2.7		0.20	0.20	% by dwt			02/02/18 14:33	1
Total Solids	61.2		0.1	0.1	%			01/29/18 15:25	1

Client Sample ID: SG-14-012518
Date Collected: 01/25/18 09:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-2
Matrix: Solid
Percent Solids: 68.3

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	0.88		0.20	0.20	% by dwt			02/02/18 14:56	1
Total Solids	68.3		0.1	0.1	%			01/29/18 15:25	1

Client Sample ID: SG-16-012518
Date Collected: 01/25/18 10:10
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-3
Matrix: Solid
Percent Solids: 65.8

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	0.75		0.20	0.20	% by dwt			02/02/18 15:01	1
Total Solids	65.8		0.1	0.1	%			01/29/18 15:25	1

Client Sample ID: SG-17-012518
Date Collected: 01/25/18 10:40
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-4
Matrix: Solid
Percent Solids: 63.9

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	0.77		0.20	0.20	% by dwt			02/02/18 15:20	1
Total Solids	63.9		0.1	0.1	%			01/29/18 15:25	1

Client Sample ID: DUP-1-012518
Date Collected: 01/25/18 10:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-5
Matrix: Solid
Percent Solids: 65.2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	0.76		0.20	0.20	% by dwt			02/02/18 15:25	1
Total Solids	65.2		0.1	0.1	%			01/29/18 15:25	1

Method: PSEP Plumb 1981 - Grain Size (PSEP Plumb 1981)

Client Sample ID: G-5-012518
Date Collected: 01/25/18 11:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-1
Matrix: Solid
Percent Solids: 61.2

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Clay	10.5				%			02/08/18 13:22	1
Sand	27.2				%			02/08/18 13:22	1
Silt	38.6				%			02/08/18 13:22	1
Gravel	23.7				%			02/08/18 13:22	1
Cobbles	0.000				%			02/08/18 13:22	1

Client Sample ID: SG-14-012518
Date Collected: 01/25/18 09:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-2
Matrix: Solid
Percent Solids: 68.3

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Clay	9.6				%			02/08/18 13:22	1
Sand	51				%			02/08/18 13:22	1
Silt	37				%			02/08/18 13:22	1
Gravel	2.1				%			02/08/18 13:22	1
Cobbles	0.00				%			02/08/18 13:22	1

Client Sample ID: SG-16-012518
Date Collected: 01/25/18 10:10
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-3
Matrix: Solid
Percent Solids: 65.8

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Clay	13				%			02/08/18 13:22	1
Sand	35				%			02/08/18 13:22	1
Silt	51				%			02/08/18 13:22	1
Gravel	0.80				%			02/08/18 13:22	1
Cobbles	0.00				%			02/08/18 13:22	1

Client Sample ID: SG-17-012518
Date Collected: 01/25/18 10:40
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-4
Matrix: Solid
Percent Solids: 63.9

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Clay	13				%			02/08/18 13:22	1
Sand	33				%			02/08/18 13:22	1
Silt	54				%			02/08/18 13:22	1
Gravel	0.40				%			02/08/18 13:22	1
Cobbles	0.00				%			02/08/18 13:22	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-266639/1-A
Matrix: Solid
Analysis Batch: 266728

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 266639

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		5.0	5.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
1,2-Dichlorobenzene	ND		5.0	5.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
1,4-Dichlorobenzene	ND		5.0	5.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
2,4-Dimethylphenol	ND		10	10	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
2-Methylnaphthalene	ND		5.0	5.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
2-Methylphenol	ND		15	15	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
3 & 4 Methylphenol	ND		20	20	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Acenaphthene	ND		2.5	2.5	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Acenaphthylene	ND		2.5	2.5	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Anthracene	ND		2.5	2.5	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Benzo[a]anthracene	ND		2.5	2.5	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Benzo[a]pyrene	ND		6.0	6.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Benzo[g,h,i]perylene	ND		6.0	6.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Benzofluoranthene	ND		15	15	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Bis(2-ethylhexyl) phthalate	ND		60	60	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Butyl benzyl phthalate	ND		20	20	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Carbazole	ND		15	15	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Dibenz(a,h)anthracene	ND		5.0	5.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Dibenzofuran	ND		15	15	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Diethyl phthalate	ND		55	55	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Dimethyl phthalate	ND		15	15	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Di-n-butyl phthalate	ND		50	50	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Di-n-octyl phthalate	ND		100	100	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Fluorene	ND		2.5	2.5	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Hexachlorobenzene	ND		5.0	5.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Hexachlorobutadiene	ND		5.0	5.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Indeno[1,2,3-cd]pyrene	ND		4.0	4.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Naphthalene	ND		2.5	2.5	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
N-Nitrosodiphenylamine	ND		6.0	6.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Pentachlorophenol	ND		40	40	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Phenanthrene	ND		6.0	6.0	ug/Kg		02/05/18 09:02	02/06/18 13:08	1
Phenol	ND		15	15	ug/Kg		02/05/18 09:02	02/06/18 13:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*101*		*57 - 110*	*02/05/18 09:02*	*02/06/18 13:08*	*1*
2-Fluorophenol	*83*		*36 - 125*	*02/05/18 09:02*	*02/06/18 13:08*	*1*
Nitrobenzene-d5	*105*		*54 - 113*	*02/05/18 09:02*	*02/06/18 13:08*	*1*
Phenol-d5	*86*		*59 - 113*	*02/05/18 09:02*	*02/06/18 13:08*	*1*

Lab Sample ID: LCS 580-266639/2-A
Matrix: Solid
Analysis Batch: 266728

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 266639

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,4-Trichlorobenzene	100	97.5		ug/Kg		97	66 - 120
1,2-Dichlorobenzene	100	80.7		ug/Kg		81	73 - 120
1,4-Dichlorobenzene	100	84.8		ug/Kg		85	70 - 120
2,4-Dimethylphenol	100	44.1	*	ug/Kg		44	64 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-266639/2-A
Matrix: Solid
Analysis Batch: 266728

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 266639

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Methylnaphthalene	100	84.3		ug/Kg		84	71 - 120
2-Methylphenol	100	95.9		ug/Kg		96	70 - 120
3 & 4 Methylphenol	100	81.8		ug/Kg		82	70 - 120
Acenaphthene	100	88.0		ug/Kg		88	71 - 120
Acenaphthylene	100	88.0		ug/Kg		88	73 - 128
Anthracene	100	83.1		ug/Kg		83	74 - 120
Benzo[a]anthracene	100	88.1		ug/Kg		88	73 - 120
Benzo[a]pyrene	100	87.2		ug/Kg		87	72 - 121
Benzo[g,h,i]perylene	100	96.6		ug/Kg		97	75 - 122
Benzofluoranthene	200	175		ug/Kg		88	71 - 120
Bis(2-ethylhexyl) phthalate	100	84.0		ug/Kg		84	66 - 130
Butyl benzyl phthalate	100	88.6		ug/Kg		89	67 - 135
Carbazole	100	92.0		ug/Kg		92	80 - 131
Dibenz(a,h)anthracene	100	97.5		ug/Kg		98	71 - 120
Dibenzofuran	100	91.8		ug/Kg		92	77 - 120
Diethyl phthalate	100	98.6		ug/Kg		99	71 - 120
Dimethyl phthalate	100	101		ug/Kg		101	77 - 120
Di-n-butyl phthalate	100	86.1		ug/Kg		86	68 - 129
Di-n-octyl phthalate	100	ND		ug/Kg		81	68 - 124
Fluorene	100	92.7		ug/Kg		93	68 - 121
Hexachlorobenzene	100	94.9		ug/Kg		95	70 - 120
Hexachlorobutadiene	100	96.4		ug/Kg		96	71 - 120
Indeno[1,2,3-cd]pyrene	100	82.7		ug/Kg		83	75 - 120
Naphthalene	100	82.0		ug/Kg		82	75 - 120
N-Nitrosodiphenylamine	100	82.9		ug/Kg		83	73 - 127
Pentachlorophenol	200	78.2		ug/Kg		39	36 - 120
Phenanthrene	100	82.0		ug/Kg		82	73 - 120
Phenol	100	84.2		ug/Kg		84	65 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl	*97*		*57 - 110*
2-Fluorophenol	*84*		*36 - 125*
Nitrobenzene-d5	*101*		*54 - 113*
Phenol-d5	*90*		*59 - 113*

Lab Sample ID: 580-74664-1 MS
Matrix: Solid
Analysis Batch: 266728

Client Sample ID: G-5-012518
Prep Type: Total/NA
Prep Batch: 266639

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,4-Trichlorobenzene	ND		163	117		ug/Kg	☼	72	66 - 120
1,2-Dichlorobenzene	ND	F1	163	87.5	F1	ug/Kg	☼	54	73 - 120
1,4-Dichlorobenzene	ND	F1	163	86.1	F1	ug/Kg	☼	53	70 - 120
2,4-Dimethylphenol	ND	*	163	140		ug/Kg	☼	86	64 - 120
2-Methylnaphthalene	ND		163	116		ug/Kg	☼	71	71 - 120
2-Methylphenol	ND		163	116		ug/Kg	☼	72	70 - 120
3 & 4 Methylphenol	ND	F1	163	118		ug/Kg	☼	73	70 - 120
Acenaphthene	16	F1	163	120	F1	ug/Kg	☼	64	71 - 120

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 580-74664-1 MS
Matrix: Solid
Analysis Batch: 266728

Client Sample ID: G-5-012518
Prep Type: Total/NA
Prep Batch: 266639

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthylene	14		163	151		ug/Kg	☼	85	73 - 128
Anthracene	46	F1 F2	163	258	F1	ug/Kg	☼	130	74 - 120
Benzo[a]anthracene	270	F1 F2	163	982	F1	ug/Kg	☼	438	73 - 120
Benzo[a]pyrene	150	F1 F2	163	461	F1	ug/Kg	☼	191	72 - 121
Benzo[g,h,i]perylene	41	F1 F2	163	140	F1	ug/Kg	☼	61	75 - 122
Benzofluoranthene	370	F1 F2	325	1870	F1	ug/Kg	☼	461	71 - 120
Bis(2-ethylhexyl) phthalate	ND	F2	163	186		ug/Kg	☼	115	66 - 130
Butyl benzyl phthalate	ND		163	135		ug/Kg	☼	83	67 - 135
Carbazole	ND	F2	163	213		ug/Kg	☼	131	80 - 131
Dibenz(a,h)anthracene	14	F1 F2	163	106	F1	ug/Kg	☼	57	71 - 120
Dibenzofuran	ND	F1	163	122	F1	ug/Kg	☼	75	77 - 120
Diethyl phthalate	ND		163	123		ug/Kg	☼	76	71 - 120
Dimethyl phthalate	ND		163	127		ug/Kg	☼	78	77 - 120
Di-n-butyl phthalate	ND		163	123		ug/Kg	☼	76	68 - 129
Di-n-octyl phthalate	ND	F1	163	ND	F1	ug/Kg	☼	0	68 - 124
Fluorene	20		163	135		ug/Kg	☼	71	68 - 121
Hexachlorobenzene	ND		163	126		ug/Kg	☼	77	70 - 120
Hexachlorobutadiene	ND	F1	163	109	F1	ug/Kg	☼	67	71 - 120
Indeno[1,2,3-cd]pyrene	51	F1 F2	163	173		ug/Kg	☼	75	75 - 120
Naphthalene	6.4	F1	163	114	F1	ug/Kg	☼	66	75 - 120
N-Nitrosodiphenylamine	ND	F1	163	119		ug/Kg	☼	73	73 - 127
Pentachlorophenol	ND		325	279		ug/Kg	☼	86	36 - 120
Phenanthrene	85	F1 F2	163	328	F1	ug/Kg	☼	149	73 - 120
Phenol	ND		163	136		ug/Kg	☼	84	65 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2-Fluorobiphenyl	*68*		*57 - 110*
2-Fluorophenol	*79*		*36 - 125*
Nitrobenzene-d5	*80*		*54 - 113*
Phenol-d5	*81*		*59 - 113*

Lab Sample ID: 580-74664-1 MSD
Matrix: Solid
Analysis Batch: 266728

Client Sample ID: G-5-012518
Prep Type: Total/NA
Prep Batch: 266639

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	ND		159	113		ug/Kg	☼	71	66 - 120	3	18
1,2-Dichlorobenzene	ND	F1	159	79.6	F1	ug/Kg	☼	50	73 - 120	9	20
1,4-Dichlorobenzene	ND	F1	159	80.1	F1	ug/Kg	☼	51	70 - 120	7	19
2,4-Dimethylphenol	ND	*	159	124		ug/Kg	☼	78	64 - 120	12	40
2-Methylnaphthalene	ND		159	116		ug/Kg	☼	73	71 - 120	0	11
2-Methylphenol	ND		159	120		ug/Kg	☼	76	70 - 120	3	25
3 & 4 Methylphenol	ND	F1	159	105	F1	ug/Kg	☼	66	70 - 120	12	27
Acenaphthene	16	F1	159	132		ug/Kg	☼	73	71 - 120	9	13
Acenaphthylene	14		159	131		ug/Kg	☼	74	73 - 128	14	25
Anthracene	46	F1 F2	159	190	F2	ug/Kg	☼	91	74 - 120	30	15
Benzo[a]anthracene	270	F1 F2	159	364	F1 F2	ug/Kg	☼	59	73 - 120	92	13
Benzo[a]pyrene	150	F1 F2	159	281	F2	ug/Kg	☼	83	72 - 121	49	17

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 580-74664-1 MSD
Matrix: Solid
Analysis Batch: 266728

Client Sample ID: G-5-012518
Prep Type: Total/NA
Prep Batch: 266639

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzo[g,h,i]perylene	41	F1 F2	159	96.0	F1 F2	ug/Kg	☼	35	75 - 122	37	17
Benzofluoranthene	370	F1 F2	317	701	F2	ug/Kg	☼	103	71 - 120	91	10
Bis(2-ethylhexyl) phthalate	ND	F2	159	148	F2	ug/Kg	☼	94	66 - 130	23	22
Butyl benzyl phthalate	ND		159	144		ug/Kg	☼	91	67 - 135	7	19
Carbazole	ND	F2	159	142	F2	ug/Kg	☼	90	80 - 131	40	16
Dibenz(a,h)anthracene	14	F1 F2	159	81.9	F1 F2	ug/Kg	☼	43	71 - 120	26	16
Dibenzofuran	ND	F1	159	129		ug/Kg	☼	82	77 - 120	6	19
Diethyl phthalate	ND		159	137		ug/Kg	☼	87	71 - 120	11	13
Dimethyl phthalate	ND		159	133		ug/Kg	☼	84	77 - 120	4	18
Di-n-butyl phthalate	ND		159	120		ug/Kg	☼	76	68 - 129	3	18
Di-n-octyl phthalate	ND	F1	159	ND		ug/Kg	☼	NC	68 - 124	NC	18
Fluorene	20		159	150		ug/Kg	☼	82	68 - 121	10	14
Hexachlorobenzene	ND		159	125		ug/Kg	☼	79	70 - 120	1	17
Hexachlorobutadiene	ND	F1	159	114		ug/Kg	☼	72	71 - 120	5	21
Indeno[1,2,3-cd]pyrene	51	F1 F2	159	109	F1 F2	ug/Kg	☼	36	75 - 120	45	14
Naphthalene	6.4	F1	159	109	F1	ug/Kg	☼	65	75 - 120	4	15
N-Nitrosodiphenylamine	ND	F1	159	114	F1	ug/Kg	☼	72	73 - 127	4	40
Pentachlorophenol	ND		317	263		ug/Kg	☼	83	36 - 120	6	40
Phenanthrene	85	F1 F2	159	231	F2	ug/Kg	☼	92	73 - 120	35	14
Phenol	ND		159	122		ug/Kg	☼	77	65 - 120	11	19

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2-Fluorobiphenyl	*76*		*57 - 110*
2-Fluorophenol	*79*		*36 - 125*
Nitrobenzene-d5	*84*		*54 - 113*
Phenol-d5	*78*		*59 - 113*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RA

Lab Sample ID: MB 580-266639/1-A
Matrix: Solid
Analysis Batch: 267064

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 266639

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzoic acid - RA	ND		250	250	ug/Kg		02/05/18 09:02	02/09/18 19:24	1
Benzyl alcohol - RA	ND		400	400	ug/Kg		02/05/18 09:02	02/09/18 19:24	1
Chrysene - RA	ND		6.0	6.0	ug/Kg		02/05/18 09:02	02/09/18 19:24	1
Fluoranthene - RA	ND		2.5	2.5	ug/Kg		02/05/18 09:02	02/09/18 19:24	1
Pyrene - RA	ND		6.0	6.0	ug/Kg		02/05/18 09:02	02/09/18 19:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol - RA	*39*		*10 - 126*	*02/05/18 09:02*	*02/09/18 19:24*	*1*
Terphenyl-d14 - RA	*115*		*68 - 120*	*02/05/18 09:02*	*02/09/18 19:24*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) - RA (Continued)

Lab Sample ID: LCS 580-266639/2-A
Matrix: Solid
Analysis Batch: 267064

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 266639

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzoic acid - RA	200	ND		ug/Kg		18	10 - 141
Benzyl alcohol - RA	100	ND	*	ug/Kg		47	60 - 120
Chrysene - RA	100	79.8		ug/Kg		80	71 - 120
Fluoranthene - RA	100	92.0		ug/Kg		92	75 - 120
Pyrene - RA	100	85.7		ug/Kg		86	73 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol - RA	*69*		*10 - 126*
Terphenyl-d14 - RA	*96*		*68 - 120*

Lab Sample ID: 580-74664-1 MS
Matrix: Solid
Analysis Batch: 267064

Client Sample ID: G-5-012518
Prep Type: Total/NA
Prep Batch: 266639

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzoic acid - RA	ND		325	ND		ug/Kg	☼	NC	10 - 141
Benzyl alcohol - RA	ND	*	163	ND		ug/Kg	☼	NC	60 - 120
Chrysene - RA	400	F2 F1	163	1860	E F1	ug/Kg	☼	902	71 - 120
Fluoranthene - RA	650	F2	163	3110	E 4	ug/Kg	☼	1514	75 - 120
Pyrene - RA	490	F2 F1	163	1980	E F1	ug/Kg	☼	913	73 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4,6-Tribromophenol - RA	*82*		*10 - 126*
Terphenyl-d14 - RA	*83*		*68 - 120*

Lab Sample ID: 580-74664-1 MSD
Matrix: Solid
Analysis Batch: 267064

Client Sample ID: G-5-012518
Prep Type: Total/NA
Prep Batch: 266639

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzoic acid - RA	ND		317	ND		ug/Kg	☼	NC	10 - 141	NC	40
Benzyl alcohol - RA	ND	*	159	ND		ug/Kg	☼	NC	60 - 120	NC	26
Chrysene - RA	400	F2 F1	159	729	F1 F2	ug/Kg	☼	209	71 - 120	88	13
Fluoranthene - RA	650	F2	159	736	4 F2	ug/Kg	☼	54	75 - 120	123	23
Pyrene - RA	490	F2 F1	159	694	F1 F2	ug/Kg	☼	128	73 - 120	96	15

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4,6-Tribromophenol - RA	*90*		*10 - 126*
Terphenyl-d14 - RA	*86*		*68 - 120*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 580-266713/1-A
Matrix: Solid
Analysis Batch: 266785

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 266713

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		1.0	1.0	ug/Kg		02/06/18 09:24	02/07/18 21:37	1
PCB-1221	ND		1.1	1.1	ug/Kg		02/06/18 09:24	02/07/18 21:37	1
PCB-1232	ND		1.1	1.1	ug/Kg		02/06/18 09:24	02/07/18 21:37	1
PCB-1242	ND		1.0	1.0	ug/Kg		02/06/18 09:24	02/07/18 21:37	1
PCB-1248	ND		1.1	1.1	ug/Kg		02/06/18 09:24	02/07/18 21:37	1
PCB-1254	ND		1.0	1.0	ug/Kg		02/06/18 09:24	02/07/18 21:37	1
PCB-1260	ND		1.0	1.0	ug/Kg		02/06/18 09:24	02/07/18 21:37	1
Polychlorinated biphenyls, Total	ND		1.1	1.1	ug/Kg		02/06/18 09:24	02/07/18 21:37	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*85*		*25 - 149*	*02/06/18 09:24*	*02/07/18 21:37*	*1*
Tetrachloro-m-xylene	*41*		*35 - 130*	*02/06/18 09:24*	*02/07/18 21:37*	*1*

Lab Sample ID: LCS 580-266713/2-A
Matrix: Solid
Analysis Batch: 266785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 266713

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
PCB-1016			10.0	7.02		ug/Kg		70	69 - 126		
PCB-1260			10.0	9.10		ug/Kg		91	68 - 136		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*100*		*25 - 149*
Tetrachloro-m-xylene	*56*		*35 - 130*

Lab Sample ID: 580-74664-5 MS
Matrix: Solid
Analysis Batch: 266971

Client Sample ID: DUP-1-012518
Prep Type: Total/NA
Prep Batch: 266713

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
PCB-1016	ND	F2 *	14.9	17.9		ug/Kg	☼	120	69 - 126		
PCB-1260	ND	F2 F1	14.9	26.0	F1	ug/Kg	☼	174	68 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*84*		*25 - 149*
Tetrachloro-m-xylene	*28*	*X*	*35 - 130*

Lab Sample ID: 580-74664-5 MSD
Matrix: Solid
Analysis Batch: 266971

Client Sample ID: DUP-1-012518
Prep Type: Total/NA
Prep Batch: 266713

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
PCB-1016	ND	F2 *	14.9	12.3	F2	ug/Kg	☼	83	69 - 126	37	17
PCB-1260	ND	F2 F1	14.9	17.5	F2	ug/Kg	☼	117	68 - 136	39	21

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*89*		*25 - 149*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: 580-74664-5 MSD
Matrix: Solid
Analysis Batch: 266971

Client Sample ID: DUP-1-012518
Prep Type: Total/NA
Prep Batch: 266713

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*56*		*35 - 130*

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-266716/12-A
Matrix: Solid
Analysis Batch: 266794

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 266716

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.25	0.25	mg/Kg		02/06/18 09:45	02/06/18 13:16	5
Cadmium	ND		0.20	0.20	mg/Kg		02/06/18 09:45	02/06/18 13:16	5
Chromium	ND		0.25	0.25	mg/Kg		02/06/18 09:45	02/06/18 13:16	5
Copper	ND		0.50	0.50	mg/Kg		02/06/18 09:45	02/06/18 13:16	5
Lead	ND		0.25	0.25	mg/Kg		02/06/18 09:45	02/06/18 13:16	5
Nickel	ND		0.25	0.25	mg/Kg		02/06/18 09:45	02/06/18 13:16	5
Silver	ND		0.10	0.10	mg/Kg		02/06/18 09:45	02/06/18 13:16	5
Zinc	ND		2.5	2.5	mg/Kg		02/06/18 09:45	02/06/18 13:16	5

Lab Sample ID: LCS 580-266716/13-A
Matrix: Solid
Analysis Batch: 266794

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 266716

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	198		mg/Kg		99	80 - 120
Cadmium	5.00	4.95		mg/Kg		99	80 - 120
Chromium	20.0	20.0		mg/Kg		100	80 - 120
Copper	25.0	24.9		mg/Kg		100	80 - 120
Lead	50.0	49.4		mg/Kg		99	80 - 120
Nickel	50.0	50.8		mg/Kg		102	80 - 120
Silver	30.0	30.2		mg/Kg		101	80 - 120
Zinc	200	192		mg/Kg		96	80 - 120

Lab Sample ID: LCSD 580-266716/14-A
Matrix: Solid
Analysis Batch: 266794

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 266716

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	195		mg/Kg		97	80 - 120	2	20
Cadmium	5.00	5.01		mg/Kg		100	80 - 120	1	20
Chromium	20.0	19.3		mg/Kg		96	80 - 120	3	20
Copper	25.0	25.2		mg/Kg		101	80 - 120	1	20
Lead	50.0	48.9		mg/Kg		98	80 - 120	1	20
Nickel	50.0	49.4		mg/Kg		99	80 - 120	3	20
Silver	30.0	29.5		mg/Kg		98	80 - 120	2	20
Zinc	200	187		mg/Kg		94	80 - 120	3	20

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 580-74664-2 MS
Matrix: Solid
Analysis Batch: 266794

Client Sample ID: SG-14-012518
Prep Type: Total/NA
Prep Batch: 266716

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	8.5		209	217		mg/Kg	☼	100	80 - 120
Cadmium	ND		5.21	5.21		mg/Kg	☼	100	80 - 120
Chromium	17	F1	20.9	40.2		mg/Kg	☼	110	80 - 120
Copper	43	F1	26.1	81.4	F1	mg/Kg	☼	149	80 - 120
Lead	13		52.1	66.5		mg/Kg	☼	103	80 - 120
Nickel	11		52.1	62.8		mg/Kg	☼	99	80 - 120
Silver	ND		31.3	31.9		mg/Kg	☼	102	80 - 120
Zinc	77		209	291		mg/Kg	☼	103	80 - 120

Lab Sample ID: 580-74664-2 MSD
Matrix: Solid
Analysis Batch: 266794

Client Sample ID: SG-14-012518
Prep Type: Total/NA
Prep Batch: 266716

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	8.5		210	233		mg/Kg	☼	107	80 - 120	7	20
Cadmium	ND		5.25	5.65		mg/Kg	☼	108	80 - 120	8	20
Chromium	17	F1	21.0	43.8	F1	mg/Kg	☼	126	80 - 120	9	20
Copper	43	F1	26.2	92.1	F1	mg/Kg	☼	189	80 - 120	12	20
Lead	13		52.5	72.4		mg/Kg	☼	113	80 - 120	9	20
Nickel	11		52.5	68.4		mg/Kg	☼	109	80 - 120	8	20
Silver	ND		31.5	33.9		mg/Kg	☼	108	80 - 120	6	20
Zinc	77		210	314		mg/Kg	☼	113	80 - 120	8	20

Lab Sample ID: 580-74664-2 DU
Matrix: Solid
Analysis Batch: 266794

Client Sample ID: SG-14-012518
Prep Type: Total/NA
Prep Batch: 266716

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	8.5		9.58		mg/Kg	☼	12	20
Cadmium	ND		ND		mg/Kg	☼	NC	20
Chromium	17	F1	16.6		mg/Kg	☼	4	20
Copper	43	F1	46.0		mg/Kg	☼	8	20
Lead	13		15.6		mg/Kg	☼	18	20
Nickel	11		11.0		mg/Kg	☼	2	20
Silver	ND		ND		mg/Kg	☼	NC	20
Zinc	77		78.7		mg/Kg	☼	2	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 580-266447/16-A
Matrix: Solid
Analysis Batch: 266511

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 266447

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.030	0.030	mg/Kg		02/01/18 10:22	02/01/18 12:12	1

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 580-266447/17-A
Matrix: Solid
Analysis Batch: 266511

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 266447

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.167	0.169		mg/Kg		101	80 - 120

Lab Sample ID: LCSD 580-266447/18-A
Matrix: Solid
Analysis Batch: 266511

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 266447

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.167	0.159		mg/Kg		95	80 - 120	6	20

Lab Sample ID: 580-74664-1 MS
Matrix: Solid
Analysis Batch: 266511

Client Sample ID: G-5-012518
Prep Type: Total/NA
Prep Batch: 266447

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.048		0.184	0.250		mg/Kg	☼	110	80 - 120

Lab Sample ID: 580-74664-1 DU
Matrix: Solid
Analysis Batch: 266511

Client Sample ID: G-5-012518
Prep Type: Total/NA
Prep Batch: 266447

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	0.048		0.0490		mg/Kg	☼	1	20

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: MB 580-266658/3
Matrix: Solid
Analysis Batch: 266658

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		0.20	0.20	% by dwt			02/02/18 12:23	1

Lab Sample ID: LCS 580-266658/4
Matrix: Solid
Analysis Batch: 266658

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	0.462	0.517		% by dwt		112	68 - 149

Lab Sample ID: LCSD 580-266658/5
Matrix: Solid
Analysis Batch: 266658

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	0.462	0.481		% by dwt		104	68 - 149	7	32

Method: 9060_PSEP - TOC (Puget Sound) (Continued)

Lab Sample ID: 580-74664-1 MS
Matrix: Solid
Analysis Batch: 266658

Client Sample ID: G-5-012518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Organic Carbon - Duplicates	2.7		12.0	13.5		% by dwt		90	68 - 149		

Lab Sample ID: 580-74664-1 MSD
Matrix: Solid
Analysis Batch: 266658

Client Sample ID: G-5-012518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	2.7		12.0	13.4		% by dwt		89	68 - 149	1	32

Lab Sample ID: 580-74664-1 DU
Matrix: Solid
Analysis Batch: 266658

Client Sample ID: G-5-012518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Organic Carbon - Duplicates	2.7			2.79		% by dwt				4	50

Lab Sample ID: 580-74664-1 TRL
Matrix: Solid
Analysis Batch: 266658

Client Sample ID: G-5-012518
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		TRL Result	TRL Qualifier	Unit	D			RSD	RSD Limit
Total Organic Carbon - Duplicates	2.7			2.71		% by dwt				2	20

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Tru Grit

TestAmerica Job ID: 580-74664-1

Client Sample ID: G-5-012518
Date Collected: 01/25/18 11:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	266658	02/02/18 14:33	MP	TAL SEA
Total/NA	Analysis	D 2216		1	266209	01/29/18 15:25	TTN	TAL SEA
Total/NA	Analysis	PSEP Plumb 1981		1	266952	02/08/18 13:22	MP	TAL SEA

Client Sample ID: G-5-012518
Date Collected: 01/25/18 11:15
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-1
Matrix: Solid
Percent Solids: 61.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550B	RA		266639	02/05/18 09:02	TTN	TAL SEA
Total/NA	Analysis	8270D	RA	1	267064	02/09/18 22:20	W1T	TAL SEA
Total/NA	Prep	3550B			266639	02/05/18 09:02	TTN	TAL SEA
Total/NA	Analysis	8270D		1	266728	02/06/18 18:51	TL1	TAL SEA
Total/NA	Prep	3550B			266713	02/06/18 09:24	TTN	TAL SEA
Total/NA	Analysis	8082A		1	266971	02/08/18 20:46	Y1W	TAL SEA
Total/NA	Prep	3050B			266716	02/06/18 09:45	ASJ	TAL SEA
Total/NA	Analysis	6020A		5	266794	02/06/18 14:23	FCW	TAL SEA
Total/NA	Prep	7471A			266447	02/01/18 10:22	ASJ	TAL SEA
Total/NA	Analysis	7471A		1	266511	02/01/18 12:19	PAB	TAL SEA

Client Sample ID: SG-14-012518
Date Collected: 01/25/18 09:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	266658	02/02/18 14:56	MP	TAL SEA
Total/NA	Analysis	D 2216		1	266209	01/29/18 15:25	TTN	TAL SEA
Total/NA	Analysis	PSEP Plumb 1981		1	266952	02/08/18 13:22	MP	TAL SEA

Client Sample ID: SG-14-012518
Date Collected: 01/25/18 09:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-2
Matrix: Solid
Percent Solids: 68.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550B	RA		266639	02/05/18 09:02	TTN	TAL SEA
Total/NA	Analysis	8270D	RA	1	267064	02/10/18 00:49	W1T	TAL SEA
Total/NA	Prep	3550B			266639	02/05/18 09:02	TTN	TAL SEA
Total/NA	Analysis	8270D		1	266728	02/06/18 20:05	TL1	TAL SEA
Total/NA	Prep	3550B			266713	02/06/18 09:24	TTN	TAL SEA
Total/NA	Analysis	8082A		1	266971	02/08/18 21:03	Y1W	TAL SEA
Total/NA	Prep	3050B			266716	02/06/18 09:45	ASJ	TAL SEA
Total/NA	Analysis	6020A		5	266794	02/06/18 13:32	FCW	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Tru Grit

TestAmerica Job ID: 580-74664-1

Client Sample ID: SG-14-012518
Date Collected: 01/25/18 09:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-2
Matrix: Solid
Percent Solids: 68.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			266447	02/01/18 10:22	ASJ	TAL SEA
Total/NA	Analysis	7471A		1	266511	02/01/18 12:28	PAB	TAL SEA

Client Sample ID: SG-16-012518
Date Collected: 01/25/18 10:10
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	266658	02/02/18 15:01	MP	TAL SEA
Total/NA	Analysis	D 2216		1	266209	01/29/18 15:25	TTN	TAL SEA
Total/NA	Analysis	PSEP Plumb 1981		1	266952	02/08/18 13:22	MP	TAL SEA

Client Sample ID: SG-16-012518
Date Collected: 01/25/18 10:10
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-3
Matrix: Solid
Percent Solids: 65.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550B	RA		266639	02/05/18 09:02	TTN	TAL SEA
Total/NA	Analysis	8270D	RA	1	267064	02/10/18 01:13	W1T	TAL SEA
Total/NA	Prep	3550B			266639	02/05/18 09:02	TTN	TAL SEA
Total/NA	Analysis	8270D		1	266728	02/06/18 20:30	TL1	TAL SEA
Total/NA	Prep	3550B			266713	02/06/18 09:24	TTN	TAL SEA
Total/NA	Analysis	8082A		1	266971	02/08/18 21:19	Y1W	TAL SEA
Total/NA	Prep	3050B			266716	02/06/18 09:45	ASJ	TAL SEA
Total/NA	Analysis	6020A		5	266794	02/06/18 14:11	FCW	TAL SEA
Total/NA	Prep	7471A			266447	02/01/18 10:22	ASJ	TAL SEA
Total/NA	Analysis	7471A		1	266511	02/01/18 12:30	PAB	TAL SEA

Client Sample ID: SG-17-012518
Date Collected: 01/25/18 10:40
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74664-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	266658	02/02/18 15:20	MP	TAL SEA
Total/NA	Analysis	D 2216		1	266209	01/29/18 15:25	TTN	TAL SEA
Total/NA	Analysis	PSEP Plumb 1981		1	266952	02/08/18 13:22	MP	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: Tru Grit

TestAmerica Job ID: 580-74664-1

Client Sample ID: SG-17-012518

Lab Sample ID: 580-74664-4
Date Collected: 01/25/18 10:40
Matrix: Solid
Date Received: 01/25/18 15:15
Percent Solids: 63.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550B	RA		266639	02/05/18 09:02	TTN	TAL SEA
Total/NA	Analysis	8270D	RA	1	267064	02/10/18 01:38	W1T	TAL SEA
Total/NA	Prep	3550B			266639	02/05/18 09:02	TTN	TAL SEA
Total/NA	Analysis	8270D		1	266728	02/06/18 20:54	TL1	TAL SEA
Total/NA	Prep	3550B			266713	02/06/18 09:24	TTN	TAL SEA
Total/NA	Analysis	8082A		1	266971	02/08/18 21:36	Y1W	TAL SEA
Total/NA	Prep	3050B			266716	02/06/18 09:45	ASJ	TAL SEA
Total/NA	Analysis	6020A		5	266794	02/06/18 14:15	FCW	TAL SEA
Total/NA	Prep	7471A			266447	02/01/18 10:22	ASJ	TAL SEA
Total/NA	Analysis	7471A		1	266511	02/01/18 12:33	PAB	TAL SEA

Client Sample ID: DUP-1-012518

Lab Sample ID: 580-74664-5
Date Collected: 01/25/18 10:15
Matrix: Solid
Date Received: 01/25/18 15:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	266658	02/02/18 15:25	MP	TAL SEA
Total/NA	Analysis	D 2216		1	266209	01/29/18 15:25	TTN	TAL SEA

Client Sample ID: DUP-1-012518

Lab Sample ID: 580-74664-5
Date Collected: 01/25/18 10:15
Matrix: Solid
Date Received: 01/25/18 15:15
Percent Solids: 65.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550B	RA		266639	02/05/18 09:02	TTN	TAL SEA
Total/NA	Analysis	8270D	RA	1	267064	02/10/18 02:02	W1T	TAL SEA
Total/NA	Prep	3550B			266639	02/05/18 09:02	TTN	TAL SEA
Total/NA	Analysis	8270D		1	266728	02/06/18 21:19	TL1	TAL SEA
Total/NA	Prep	3550B			266713	02/06/18 09:24	TTN	TAL SEA
Total/NA	Analysis	8082A		1	266971	02/08/18 21:53	Y1W	TAL SEA
Total/NA	Prep	3050B			266716	02/06/18 09:45	ASJ	TAL SEA
Total/NA	Analysis	6020A		5	266794	02/06/18 14:19	FCW	TAL SEA
Total/NA	Prep	7471A			266447	02/01/18 10:22	ASJ	TAL SEA
Total/NA	Analysis	7471A		1	266511	02/01/18 12:40	PAB	TAL SEA

Laboratory References:
TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Project/Site: Tru Grit

TestAmerica Job ID: 580-74664-1

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	10-31-18
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-74669-1
Client Project/Site: TruGrit

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Authorized for release by:
1/30/2018 5:15:36 PM

Sheri Cruz, Project Manager I
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74669-1

Job ID: 580-74669-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-74669-1

Comments
No additional comments.

Receipt
The samples were received on 1/25/2018 3:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.4° C.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74669-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74669-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-74669-1	Marine-60-012518	Water	01/25/18 11:30	01/25/18 15:15
580-74669-2	Marine-120-012518	Water	01/25/18 12:10	01/25/18 15:15
580-74669-3	Marine-DUP-012518	Water	01/25/18 11:00	01/25/18 15:15

LANDAU ASSOCIATES

- [X] **Seattle/Edmonds** (425) 778-0907
- [ ] **Tacoma** (253) 926-2493
- [ ] **Spokane** (509) 327-9737
- [ ] **Portland** (503) 542-1080
- [ ] _____

Chain-of-Custody Record

Marine Water

Loc: 580
74669

Date 1/25/18

Page 1 of 1

Project Name Tru Grit Project No. 241008.020

Project Location/Event Tacoma, WA / Bioassay

Sampler's Name Devan Brandt

Project Contact Jennifer Wynhoop

Send Results To " " Dani Jorgenson

Testing Parameters

Turnaround Time
- [X] Standard
- [ ] Accelerated
- [ ] _____

Sample I.D.	Date	Time	Matrix	No. of Containers	Diss. Copper (6020ALL) * Field Filtered
Marine-60-012518	1/25/18	1130	H_2O	1	X
Marine-120-012518	↓	1210	H_2O	1	X
Marine-DUP-012518	↓	1100	H_2O	1	X

Observations/Comments

- [X] Allow water samples to settle, collect aliquot from clear portion
- [ ] NWTPH-Dx - run acid wash silica gel cleanup
- [ ] Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
- [ ] non-preserved
- [ ] preserved w/methanol
- [ ] preserved w/sodium bisulfate
- [ ] Freeze upon receipt

- [X] Dissolved metal water samples field filtered

Other Cu RL = 0.0024 mg/L

580-74669 Chain of Custody

Therm. ID #2 Cor 5.4 Unc 6.3
Cooler Dsc Ice, Bl → @Lab
Wet/Packs Packing Bub
Cls ob Custody Seal: Yes ___ No X

Special Shipment/Handling or Storage Requirements

Method of Shipment

Relinquished by	Received by	Relinquished by	Received by
Signature [signature]	Signature B. Hall	Signature	Signature
Printed Name Devan Brandt	Printed Name B. Hall	Printed Name	Printed Name
Company LAI	Company SEA TR	Company	Company
Date 1/25/18 Time 1515	Date 1/25/18 Time 1515	Date Time	Date Time

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

1/30/2018

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-74669-1

Login Number: 74669
List Number: 1
Creator: Gall, Brandon A

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Client Sample Results

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74669-1

Method: 6020A - Metals (ICP/MS) - Dissolved

Client Sample ID: Marine-60-012518
Date Collected: 01/25/18 11:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74669-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	0.0012	J	0.0020	0.00060	mg/L		01/29/18 14:19	01/30/18 12:20	1

Client Sample ID: Marine-120-012518
Date Collected: 01/25/18 12:10
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74669-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	0.00096	J	0.0020	0.00060	mg/L		01/29/18 14:19	01/30/18 12:24	1

Client Sample ID: Marine-DUP-012518
Date Collected: 01/25/18 11:00
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74669-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	0.0013	J	0.0020	0.00060	mg/L		01/29/18 14:19	01/30/18 12:28	1

QC Sample Results

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74669-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-266192/12-A
Matrix: Water
Analysis Batch: 266298

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 266192

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.0020	0.00060	mg/L		01/29/18 14:19	01/30/18 11:29	1

Lab Sample ID: LCS 580-266192/13-A
Matrix: Water
Analysis Batch: 266298

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 266192

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Copper			0.500	0.526		mg/L		105	80 - 120		

Lab Sample ID: LCSD 580-266192/14-A
Matrix: Water
Analysis Batch: 266298

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 266192

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper			0.500	0.517		mg/L		103	80 - 120	2	20

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74669-1

Client Sample ID: Marine-60-012518
Lab Sample ID: 580-74669-1
Date Collected: 01/25/18 11:30
Matrix: Water
Date Received: 01/25/18 15:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			266192	01/29/18 14:19	PAB	TAL SEA
Dissolved	Analysis	6020A		1	266298	01/30/18 12:20	FCW	TAL SEA

Client Sample ID: Marine-120-012518
Lab Sample ID: 580-74669-2
Date Collected: 01/25/18 12:10
Matrix: Water
Date Received: 01/25/18 15:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			266192	01/29/18 14:19	PAB	TAL SEA
Dissolved	Analysis	6020A		1	266298	01/30/18 12:24	FCW	TAL SEA

Client Sample ID: Marine-DUP-012518
Lab Sample ID: 580-74669-3
Date Collected: 01/25/18 11:00
Matrix: Water
Date Received: 01/25/18 15:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			266192	01/29/18 14:19	PAB	TAL SEA
Dissolved	Analysis	6020A		1	266298	01/30/18 12:28	FCW	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74669-1

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-18
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	10-31-18
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-18

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-74670-1
Client Project/Site: TruGrit

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Sheri Cruz

Authorized for release by:
2/8/2018 4:11:33 PM

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74670-1

Job ID: 580-74670-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-74670-1

Comments
No additional comments.

Receipt
The samples were received on 1/25/2018 3:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.4° C.

Metals
Method(s) 6020A: The continuing calibration blank (CCB) for analytical batch 266527 contained Cu above the reporting limit (RL). All reported samples associated with this CCB were either ND for this analyte or contained this analyte at a concentration greater than 10X the value found in the CCB; therefore, re-analysis of samples was not performed.

Method(s) 6020A: SPLP 6020A samples were filtered through 0.45 micron filter.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74670-1

Qualifiers

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74670-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-74670-1	Pile 1- 012518	Solid	01/25/18 13:30	01/25/18 15:15
580-74670-2	Pile 2- 012518	Solid	01/25/18 13:40	01/25/18 15:15
580-74670-3	Pile 3 -012518	Solid	01/25/18 13:50	01/25/18 15:15

LANDAU ASSOCIATES

- [x] **Seattle/Edmonds** (425) 778-0907
- [ ] **Tacoma** (253) 926-2493
- [ ] **Spokane** (509) 327-9737
- [ ] **Portland** (503) 542-1080
- [ ] _____

Chain-of-Custody Record

Loc: 580
74670

Date 1/25/18
Page 1 of 1

Project Name Tru Grit Project No. ZA10008.020
Project Location/Event Tacoma, WA/Bio Assay
Sampler's Name Devan Brandt
Project Contact Jennifer Wynkoop
Send Results To " " & Dani Jorgenson

Turnaround Time
- [x] Standard
- [ ] Accelerated
- [ ] _____

Sample I.D.	Date	Time	Matrix	No. of Containers	SPLP-6020A LL	Total Copper 6020A
Pile 1-012518	1/25/18	1330	Solid	1	X	X
Pile 2-012518	"	1340	"	1	X	X
Pile 3-012518	"	1350	"	1	X	X

Observations/Comments

- [x] Allow water samples to settle, collect aliquot from clear portion
- [ ] NWTPH-Dx - run acid wash silica gel cleanup
- [ ] Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
- [ ] non-preserved
- [ ] preserved w/methanol
- [ ] preserved w/sodium bisulfate
- [ ] Freeze upon receipt
- [ ] Dissolved metal water samples field filtered

Other X Lab filter 0.45 um Filter
Cu RL = 0.0024 mg/L

580-74670 Chain of Custody

Therm. ID A2 Cor 5.4 Unc 6.3
Cooler Dsc Lvs Blue@Lab
Wet Packs Packing Bub
Cl ok Custody Seal: Yes ___ No X

Special Shipment/Handling or Storage Requirements

Method of Shipment

Relinquished by	Received by	Relinquished by	Received by
Signature [signature]	Signature [signature]	Signature	Signature
Printed Name Devan Brandt	Printed Name B. Gall	Printed Name	Printed Name
Company LAI	Company SEM	Company	Company
Date 1/25/18 Time 1515	Date 1/25/18 Time 1515	Date Time	Date Time

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

12/2014

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-74670-1

Login Number: 74670
List Number: 1
Creator: Gall, Brandon A

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74670-1

Method: 6020A - Metals (ICP/MS)

Client Sample ID: Pile 1- 012518
Date Collected: 01/25/18 13:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74670-1
Matrix: Solid
Percent Solids: 96.9

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	1900	^	0.45	0.45	mg/Kg	☼	02/01/18 11:06	02/01/18 16:04	5

Client Sample ID: Pile 2- 012518
Date Collected: 01/25/18 13:40
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74670-2
Matrix: Solid
Percent Solids: 97.1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	1900	^	0.44	0.44	mg/Kg	☼	02/01/18 11:06	02/01/18 16:08	5

Client Sample ID: Pile 3 -012518
Date Collected: 01/25/18 13:50
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74670-3
Matrix: Solid
Percent Solids: 96.9

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	1800	^	0.48	0.48	mg/Kg	☼	02/01/18 11:06	02/01/18 16:11	5

Client Sample Results

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74670-1

Method: 6020A - Metals (ICP/MS) - SPLP West

Client Sample ID: Pile 1- 012518
Date Collected: 01/25/18 13:30
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74670-1
Matrix: Solid
Percent Solids: 96.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	0.041		0.0020	0.00060	mg/L		02/01/18 11:21	02/02/18 10:55	1

Client Sample ID: Pile 2- 012518
Date Collected: 01/25/18 13:40
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74670-2
Matrix: Solid
Percent Solids: 97.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	0.10		0.0020	0.00060	mg/L		02/01/18 11:21	02/02/18 10:47	1

Client Sample ID: Pile 3 -012518
Date Collected: 01/25/18 13:50
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74670-3
Matrix: Solid
Percent Solids: 96.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	0.11		0.0020	0.00060	mg/L		02/01/18 11:21	02/02/18 10:51	1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-266452/15-A
Matrix: Solid
Analysis Batch: 266527

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 266452

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.50	0.50	mg/Kg		02/01/18 11:06	02/01/18 14:49	5

Lab Sample ID: LCS 580-266452/16-A
Matrix: Solid
Analysis Batch: 266527

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 266452

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	25.0	24.4		mg/Kg		97	80 - 120

Lab Sample ID: LCSD 580-266452/17-A
Matrix: Solid
Analysis Batch: 266527

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 266452

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper	25.0	24.5		mg/Kg		98	80 - 120	1	20

Lab Sample ID: MB 580-266408/1-B
Matrix: Solid
Analysis Batch: 266632

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 266457

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.0020	0.00060	mg/L		02/01/18 11:21	02/02/18 10:36	1

Lab Sample ID: LCS 580-266408/2-B
Matrix: Solid
Analysis Batch: 266632

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 266457

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	0.500	0.521		mg/L		104	80 - 120

Lab Sample ID: LCSD 580-266408/3-B
Matrix: Solid
Analysis Batch: 266632

Client Sample ID: Lab Control Sample Dup
Prep Type: SPLP West
Prep Batch: 266457

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper	0.500	0.524		mg/L		105	80 - 120	0	20

Lab Sample ID: 580-74670-1 MS
Matrix: Solid
Analysis Batch: 266632

Client Sample ID: Pile 1- 012518
Prep Type: SPLP West
Prep Batch: 266457

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	0.041		0.500	0.569		mg/L		106	80 - 120

Lab Sample ID: 580-74670-1 MSD
Matrix: Solid
Analysis Batch: 266632

Client Sample ID: Pile 1- 012518
Prep Type: SPLP West
Prep Batch: 266457

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper	0.041		0.500	0.556		mg/L		103	80 - 120	2	20

QC Sample Results

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74670-1

Lab Sample ID: 580-74670-1 DU
Matrix: Solid
Analysis Batch: 266632

Client Sample ID: Pile 1- 012518
Prep Type: SPLP West
Prep Batch: 266457

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Copper	0.041			0.0417		mg/L				0.8	20

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74670-1

Client Sample ID: Pile 1- 012518
Lab Sample ID: 580-74670-1
Date Collected: 01/25/18 13:30
Matrix: Solid
Date Received: 01/25/18 15:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP West	Leach	1312			266408	01/31/18 15:19	R1K	TAL SEA
SPLP West	Prep	3010A			266457	02/01/18 11:21	R1K	TAL SEA
SPLP West	Analysis	6020A		1	266632	02/02/18 10:55	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	266209	01/29/18 15:25	TTN	TAL SEA

Client Sample ID: Pile 1- 012518
Lab Sample ID: 580-74670-1
Date Collected: 01/25/18 13:30
Matrix: Solid
Date Received: 01/25/18 15:15
Percent Solids: 96.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			266452	02/01/18 11:06	PAB	TAL SEA
Total/NA	Analysis	6020A		5	266527	02/01/18 16:04	FCW	TAL SEA

Client Sample ID: Pile 2- 012518
Lab Sample ID: 580-74670-2
Date Collected: 01/25/18 13:40
Matrix: Solid
Date Received: 01/25/18 15:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP West	Leach	1312			266408	01/31/18 15:19	R1K	TAL SEA
SPLP West	Prep	3010A			266457	02/01/18 11:21	R1K	TAL SEA
SPLP West	Analysis	6020A		1	266632	02/02/18 10:47	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	266209	01/29/18 15:25	TTN	TAL SEA

Client Sample ID: Pile 2- 012518
Lab Sample ID: 580-74670-2
Date Collected: 01/25/18 13:40
Matrix: Solid
Date Received: 01/25/18 15:15
Percent Solids: 97.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			266452	02/01/18 11:06	PAB	TAL SEA
Total/NA	Analysis	6020A		5	266527	02/01/18 16:08	FCW	TAL SEA

Client Sample ID: Pile 3 -012518
Lab Sample ID: 580-74670-3
Date Collected: 01/25/18 13:50
Matrix: Solid
Date Received: 01/25/18 15:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP West	Leach	1312			266408	01/31/18 15:19	R1K	TAL SEA
SPLP West	Prep	3010A			266457	02/01/18 11:21	R1K	TAL SEA
SPLP West	Analysis	6020A		1	266632	02/02/18 10:51	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	266209	01/29/18 15:25	TTN	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74670-1

Client Sample ID: Pile 3 -012518
Date Collected: 01/25/18 13:50
Date Received: 01/25/18 15:15

Lab Sample ID: 580-74670-3
Matrix: Solid
Percent Solids: 96.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			266452	02/01/18 11:06	PAB	TAL SEA
Total/NA	Analysis	6020A		5	266527	02/01/18 16:11	FCW	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-74670-1

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-18
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	10-31-18
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-18

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-75361-1
Client Project/Site: TruGrit

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Kristine D. Allen

Authorized for release by:
3/8/2018 5:24:11 PM
Kristine Allen, Manager of Project Management
(253)248-4970
kristine.allen@testamericainc.com

Designee for

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

LINKS

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Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-75361-1

Job ID: 580-75361-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-75361-1

Comments
2/28/18 client added 6020A for As, Cu, and Zn.

Receipt
The sample was received on 2/27/2018 9:25 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1º C.

Receipt Exceptions
The following sample(s) was received at the laboratory without a sample collection time documented on the chain of custody, Sample logged in with a sample time of 0001.

General Chemistry
Method(s) 9060, 9060_PSEP: The following sample was received and analyed outside of holding time: Carr Inlet Reference (580-75361-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-75361-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-75361-1	Carr Inlet Reference	Solid	01/26/18 00:01	02/27/18 09:25

CHAIN OF CUSTODY

EcoAnalysts, Inc.
4770 NE View Dr., Port Gamble, WA. 98364
Tel: (360) 297-6040

Destination: Test America	Sample Originator (Organization): EcoAnalysts	Report Results To: Landau	Phone:
Destination Contact: Sheri Cruz	PERSON WHO COLLECTED SAMPLE: CR	Contact Name: Jennifer Wynkoop	Fax:
Date: 2/26/18	Address:	Address:	Email:
Turn-Around-Time:			
Project Name: Tru-Grit	Phone:	Analyses:	Invoicing To:
	Fax:		Comments or Special Instructions:
Contract/PO:	E-mail		

No.	Sample ID	Matrix	Volume & Type of Container	Date & Time	Grain Size	TOC	Preservation	Sample Temp Upon Receipt	LAB ID
1	Carr Inlet Reference	Sed	1 16oz jar	1/26/18	✓	✓	Ice		
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Loc: 580
75361

580-75361 Chain of Custody

Therm. ID IR5 Cor'd ◦ Uncr'd ◦
Cooler Dsc: Med Red
Wet/Packs Packing: Box
FPO
Custody Seal: Yes__ No X

Relinquished by:	Recieved by:	Relinquished by:	Recieved by:	Matrix Codes
Print Name: Julia Baum	Print Name: Tim Hobbs	Print Name:	Print Name:	FW = Fresh Water
Signature: JuBaum	Signature: Tim Hobbs	Signature:	Signature:	SB = Salt & Brackish Water
Affiliation: EcoAnalysts	Affiliation: PASEA	Affiliation:	Affiliation:	SS = Soil & Sediment
Date/Time: 2/26/18 1450	Date/Time: 2-27-18 0925	Date/Time:	Date/Time:	

CHAIN OF CUSTODY

EcoAnalysts
LIFE IN WATER

EcoAnalysts, Inc
4770 NE View Dr., Port Gamble, WA. 9836
Tel: (360) 297-604

Destination: Test America	Sample Originator (Organization): EcoAnalysts	Report Results To: Landau	Phone:
Destination Contact: Sheri Cruz	PERSON WHO COLLECTED SAMPLE: Collin Ray	Contact Name: Jennifer Wynkoop	Fax:
Date: 3/06/18	Address:	Address:	Email:
Turn-Around-Time:			
Project Name: Tru-Grit	Phone: 360-297-6040	Analyses:	Invoicing To: [redacted] Landau
	Fax:		Comments or Special Instructions:
Contract/PO:	E-mail: redwards@ecoanalysts.co JBaum, bhester		

No.	Sample ID	Matrix	Volume & Type of Container	Date & Time	[redacted]	extra material requested					Preservation	Sample Temp Upon Receipt	LAB ID
1	Carr Inlet Reference	Sed.	1-16oz	1/26/18		✓					ICE		
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

580-75361 Chain of Custody

Relinquished by:	Recieved by:	Relinquished by:	Recieved by:	Matrix Codes
Print Name: Julia Baum	Print Name: Blankinship	Print Name:	Print Name:	FW = Fresh Water
Signature: JuBaum	Signature: Tom B	Signature:	Signature:	SB = Salt & Brackish Water
Affiliation: EcoAnalysts	Affiliation: TA-Sea	Affiliation:	Affiliation:	SS = Soil & Sediment
Date/Time: 3/06/18 1130	Date/Time: 3/7/18 0935	Date/Time:	Date/Time:	TS = Tissue

35 2.7/3.9

Project Manager: CP	Contact Name: Jennifer Wynkoop	Fax:	
Address:	Address: dlj 2/23/18	Email:	
Phone:	Analyses:	Invoicing To:	
Fax:		Comments or Special Instructions:	
E-mail			

Matrix	Volume & Type of Container	Date & Time	Grain Size	TOC	Zn, Cu, AS	Preservation	Sample Temp Upon Receipt	LAB ID
Sed	1: 16oz jar	1/26/18	✓	✓	X	Ice		

Loc: 580
75361

580-75361 Chain of Custody

Therm. ID: IR5 Corr'd °C Uncr'd °C
Cooler Dsc: Med Red
Wet/Packs Packing: Bub
Custody Seal: Yes__ No X
FPO

Recieved by:	Relinquished by:	Recieved by:	Matrix Codes
Print Name: Jim Hicks	Print Name:	Print Name:	FW = Fresh Water
Signature: Jim Hicks	Signature:	Signature:	SB = Salt & Brackish Water
Affiliation: PSEA	Affiliation:	Affiliation:	SS = Soil & Sediment
Date/Time: 2-27-18 0925	Date/Time:	Date/Time:	

PAGE ___ of ___

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-75361-1

Login Number: 75361

List Source: TestAmerica Seattle

List Number: 1

Creator: Hobbs, Kenneth F

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	False	No time on COC or sample containers
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-75361-1

Method: 6020A - Metals (ICP/MS)

Client Sample ID: Carr Inlet Reference
Date Collected: 01/26/18 00:01
Date Received: 02/27/18 09:25

Lab Sample ID: 580-75361-1
Matrix: Solid
Percent Solids: 64.3

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.2		0.37	0.37	mg/Kg	☼	03/06/18 12:01	03/06/18 15:41	5
Copper	13		0.75	0.75	mg/Kg	☼	03/06/18 12:01	03/06/18 15:41	5
Zinc	33		3.7	3.7	mg/Kg	☼	03/06/18 12:01	03/06/18 15:41	5

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-75361-1

General Chemistry

Client Sample ID: Carr Inlet Reference
Date Collected: 01/26/18 00:01
Date Received: 02/27/18 09:25

Lab Sample ID: 580-75361-1
Matrix: Solid
Percent Solids: 64.3

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	6400	H	2000	2000	mg/Kg			03/02/18 13:14	1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-268412/17-A
Matrix: Solid
Analysis Batch: 268482

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 268412

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.25	0.25	mg/Kg		03/06/18 12:01	03/06/18 14:18	5
Copper	ND		0.50	0.50	mg/Kg		03/06/18 12:01	03/06/18 14:18	5
Zinc	ND		2.5	2.5	mg/Kg		03/06/18 12:01	03/06/18 14:18	5

Lab Sample ID: LCS 580-268412/18-A
Matrix: Solid
Analysis Batch: 268482

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 268412

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	197		mg/Kg		99	80 - 120
Copper	25.0	24.3		mg/Kg		97	80 - 120
Zinc	200	193		mg/Kg		96	80 - 120

Lab Sample ID: LCSD 580-268412/19-A
Matrix: Solid
Analysis Batch: 268482

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 268412

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	198		mg/Kg		99	80 - 120	0	20
Copper	25.0	24.9		mg/Kg		99	80 - 120	2	20
Zinc	200	192		mg/Kg		96	80 - 120	0	20

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: MB 580-268335/3
Matrix: Solid
Analysis Batch: 268335

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		2000	2000	mg/Kg			03/02/18 10:44	1

Lab Sample ID: LCS 580-268335/4
Matrix: Solid
Analysis Batch: 268335

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	4620	5460		mg/Kg		118	68 - 149

Lab Sample ID: LCSD 580-268335/5
Matrix: Solid
Analysis Batch: 268335

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	4620	6430		mg/Kg		139	68 - 149	16	32

Method: 9060_PSEP - TOC (Puget Sound) (Continued)

Lab Sample ID: 580-75361-1 MS
Matrix: Solid
Analysis Batch: 268335

Client Sample ID: Carr Inlet Reference
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates	6400	H	120000	103000		mg/Kg		80	68 - 149

Lab Sample ID: 580-75361-1 MSD
Matrix: Solid
Analysis Batch: 268335

Client Sample ID: Carr Inlet Reference
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	6400	H	120000	121000		mg/Kg		96	68 - 149	16	32

Lab Sample ID: 580-75361-1 DU
Matrix: Solid
Analysis Batch: 268335

Client Sample ID: Carr Inlet Reference
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon - Duplicates	6400	H	6060		mg/Kg		6	50

Lab Sample ID: 580-75361-1 TRL
Matrix: Solid
Analysis Batch: 268335

Client Sample ID: Carr Inlet Reference
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	TRL Result	TRL Qualifier	Unit	D	RSD	RSD Limit
Total Organic Carbon - Duplicates	6400	H	6080		mg/Kg		3	20

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-75361-1

Client Sample ID: Carr Inlet Reference

Lab Sample ID: 580-75361-1

Date Collected: 01/26/18 00:01

Matrix: Solid

Date Received: 02/27/18 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	268335	03/02/18 13:14	MP	TAL SEA
Total/NA	Analysis	D 2216		1	268094	02/28/18 08:59	APR	TAL SEA

Client Sample ID: Carr Inlet Reference

Lab Sample ID: 580-75361-1

Date Collected: 01/26/18 00:01

Matrix: Solid

Date Received: 02/27/18 09:25

Percent Solids: 64.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			268412	03/06/18 12:01	PAB	TAL SEA
Total/NA	Analysis	6020A		5	268482	03/06/18 15:41	FCW	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-75361-1

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	10-31-18
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-75361-2
Client Project/Site: TruGrit

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Sheri Cruz

Authorized for release by:
3/26/2018 1:18:57 PM

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-75361-2

Job ID: 580-75361-2

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-75361-2

Comments
No additional comments.

Receipt
The samples were received on 3/7/2018 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the cooler at receipt time was 0.9º C.

Receipt Exceptions
The following sample(s) was received at the laboratory without a sample collection time documented on the chain of custody, Sample Logged in for time 0001. This was extra sample received on 3/7/18 to PSEP Plumb 1981 analysis only.

Geotechnical
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-75361-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-75361-1	Carr Inlet Reference	Solid	01/26/18 00:01	02/27/18 09:25

CHAIN OF CUSTODY

EcoAnalysts, Inc.
4770 NE View Dr., Port Gamble, WA. 98364
Tel: (360) 297-6040

Destination: Test America	Sample Originator (Organization): EcoAnalysts	Report Results To: Landau	Phone:
Destination Contact: Sheri Cruz	PERSON WHO COLLECTED SAMPLE: CR	Contact Name: Jennifer Wynkoop	Fax:
Date: 2/26/18	Address:	Address:	Email:
Turn-Around-Time:			
Project Name: Tru-Grit	Phone:	Analyses:	Invoicing To:
	Fax:		Comments or Special Instructions:
Contract/PO:	E-mail		

No.	Sample ID	Matrix	Volume & Type of Container	Date & Time	Grain Size	TOC	Preservation	Sample Temp Upon Receipt	LAB ID
1	Carr Inlet Reference	Sed	1 16oz jar	1/26/18	✓	✓	Ice		
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Loc: 580
75361

580-75361 Chain of Custody

Therm. ID IR5 Cor'd ° Uncr'd °
Cooler Dsc: Med Red
Wet/Packs Packing: Bub
FPO
Custody Seal: Yes__ No X

Relinquished by:	Recieved by:	Relinquished by:	Recieved by:	Matrix Codes
Print Name: Julia Baum	Print Name: Tim Hobbs	Print Name:	Print Name:	FW = Fresh Water
Signature: JuBaum	Signature: Tim Hobbs	Signature:	Signature:	SB = Salt & Brackish Water
Affiliation: EcoAnalysts	Affiliation: PASEA	Affiliation:	Affiliation:	SS = Soil & Sediment
Date/Time: 2/26/18 1450	Date/Time: 2-27-18 0925	Date/Time:	Date/Time:	

CHAIN OF CUSTODY

EcoAnalysts
LIFE IN WATER

EcoAnalysts, Inc
4770 NE View Dr., Port Gamble, WA. 9836
Tel: (360) 297-604

Destination: Test America	Sample Originator (Organization): EcoAnalysts	Report Results To: Landau	Phone:
Destination Contact: Sheri Cruz	PERSON WHO COLLECTED SAMPLE: Collin Ray	Contact Name: Jennifer Wynkoop	Fax:
Date: 3/06/18	Address:	Address:	Email:
Turn-Around-Time:			
Project Name: Tru-Grit	Phone: 360-297-6040	Analyses:	Invoicing To: [redacted] Landau
	Fax:		Comments or Special Instructions:
Contract/PO:	E-mail: redwards@ecoanalysts.co Jbaum, bhester	[redacted] extra material requested	

No.	Sample ID	Matrix	Volume & Type of Container	Date & Time	Preservation	Sample Temp Upon Receipt	LAB ID
1	Carr Inlet Reference	Sed.	1-16oz	1/26/18	ICe		
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

580-75361 Chain of Custody

Relinquished by:	Recieved by:	Relinquished by:	Recieved by:	Matrix Codes
Print Name: Julia Baum	Print Name: Blankinship	Print Name:	Print Name:	FW = Fresh Water
Signature: JuBaum	Signature: Tom B	Signature:	Signature:	SB = Salt & Brackish Water
Affiliation: EcoAnalysts	Affiliation: TA-Sea	Affiliation:	Affiliation:	SS = Soil & Sediment
Date/Time: 3/06/18 1130	Date/Time: 3/7/18 0935	Date/Time:	Date/Time:	TS = Tissue

35 2.7/3.9

Contact Name: Jennifer Wynkoop

Address:

Phone:

Fax:

E-mail

Email:

Analyses:

Invoicing To:

Comments or Special Instructions:

Matrix	Volume & Type of Container	Date & Time	Grain Size	TOC	Zn, Cu, AS	Preservation	Sample Temp Upon Receipt	LAB ID
Sed	1: 16oz jar	1/26/18	✓	✓	X	Ice		

Loc: 580
75361

580-75361 Chain of Custody

Therm. ID: IR5 Corr'd °C Uncr'd °C
Cooler Dsc: Med Red
Wet/Packs Packing: Box
Custody Seal: Yes__ No X
FPO

Recieved by:	Relinquished by:	Recieved by:	Matrix Codes
Print Name: Jim Hicks	Print Name:	Print Name:	FW = Fresh Water
Signature: Jim Hicks	Signature:	Signature:	SB = Salt & Brackish Water
Affiliation: PASEA	Affiliation:	Affiliation:	SS = Soil & Sediment
Date/Time: 2-27-18 0925	Date/Time:	Date/Time:	

PAGE ___ of ___

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-75361-2

Login Number: 75361
List Number: 1
Creator: Hobbs, Kenneth F

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	False	No time on COC or sample containers
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-75361-2

Method: PSEP Plumb 1981 - Grain Size (PSEP Plumb 1981)

Client Sample ID: Carr Inlet Reference
Date Collected: 01/26/18 00:01
Date Received: 02/27/18 09:25

Lab Sample ID: 580-75361-1
Matrix: Solid

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Clay	4.8				%			03/19/18 13:51	1
Sand	44				%			03/19/18 13:51	1
Silt	52				%			03/19/18 13:51	1
Gravel	0.10				%			03/19/18 13:51	1
Cobbles	0.00				%			03/19/18 13:51	1

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-75361-2

Client Sample ID: Carr Inlet Reference

Lab Sample ID: 580-75361-1

Date Collected: 01/26/18 00:01

Matrix: Solid

Date Received: 02/27/18 09:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	PSEP Plumb 1981		1	269398	03/19/18 13:51	HJM	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit

TestAmerica Job ID: 580-75361-2

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	10-31-18
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-77368-1
Client Project/Site: TruGrit Bioassy Testing

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Kristine D. Allen

Authorized for release by:
5/31/2018 2:56:28 PM
Kristine Allen, Manager of Project Management
(253)248-4970
kristine.allen@testamericainc.com

Designee for

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Job ID: 580-77368-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-77368-1

Comments

Samples were analyzed on an instrument with a collision cell.

Receipt

The samples were received on 5/17/2018 12:09 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 12.0º C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit Bioassy Testing

TestAmerica Job ID: 580-77368-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-77368-1	Seep-2-20180517	Water	05/17/18 11:30	05/17/18 12:09
580-77368-2	Dup1-20180517	Water	05/17/18 11:35	05/17/18 12:09

LANDAU ASSOCIATES

- [ ] **Seattle/Edmonds** (425) 778-0907
- [x] **Tacoma** (253) 926-2493
- [ ] **Spokane** (509) 327-9737
- [ ] **Portland** (503) 542-1080
- [ ] _____

Chain-of-Custody Record

Date 5/17/18

Page 1 of 1

77368

Project Name Tru GritBioassay Testing Project No. 024i008.020.022

Project Location/Event Alexander Ave - Seep sampling

Sampler's Name Raquel Callans

Project Contact jwynkoop@landauinc.com; rcallans@landauinc.com

Send Results To see above

Testing Parameters

Turnaround Time
- [x] Standard
- [ ] Accelerated
- [ ] _____

Sample I.D.	Date	Time	Matrix	No. of Containers	Dissolved copper *
Seep-2-20180517	5/17/18	11:30	Aq.	1	X
Dup1-20180517	5/17/18	11:35	Aq	1	X

580-77368 Chain of Custody

Observations/Comments

- [x] Allow water samples to settle, collect aliquot from clear portion
- [ ] NWTPH-Dx - run acid wash silica gel cleanup
- [ ] Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
- [ ] non-preserved
- [ ] preserved w/methanol
- [ ] preserved w/sodium bisulfate
- [ ] Freeze upon receipt
- [ ] Dissolved metal water samples field filtered

Other
- In case narrative, comment use of collision technology.
- Sample likely brackish water

Notes:
* method: 6020A (ICP-MS)
Reporting Limit: .002 mg/L
HT

Therm. ID: A2 Cor: 12.0 Unc: 12.2
Cooler Dsc: Sm Red
Packing:
Cust. Seal: Yes ____ No *
Wet/Packs/Dry Ice/None

FedEx: _____
UPS: _____
Lab Cour: _____
Other: ditto

Special Shipment/Handling or Storage Requirements

Method of Shipment Drop-off

Relinquished by	Received by	Relinquished by	Received by
Signature Raquel Callans	Signature Tom Blankinship	Signature	Signature
Printed Name Raquel Callans	Printed Name	Printed Name	Printed Name
Company Landau Associates	Company TA-Sea	Company	Company
Date 5/17/18 Time 1209	Date 5/17/18 Time 1209	Date Time	Date Time

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-77368-1

Login Number: 77368

List Source: TestAmerica Seattle

List Number: 1

Creator: Blankinship, Tom X

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	Thermal preservation not required.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Client: Landau & Associates, Inc.
Project/Site: TruGrit Bioassy Testing

TestAmerica Job ID: 580-77368-1

Method: 6020A - Metals (ICP/MS) - Dissolved

Client Sample ID: Seep-2-20180517
Date Collected: 05/17/18 11:30
Date Received: 05/17/18 12:09

Lab Sample ID: 580-77368-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.0020	0.00060	mg/L		05/30/18 11:44	05/31/18 11:21	1

Client Sample ID: Dup1-20180517
Date Collected: 05/17/18 11:35
Date Received: 05/17/18 12:09

Lab Sample ID: 580-77368-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.0020	0.00060	mg/L		05/30/18 11:44	05/31/18 11:25	1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-274975/22-A
Matrix: Water
Analysis Batch: 275094

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 274975

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.0020	0.00060	mg/L		05/30/18 11:44	05/31/18 09:53	1

Lab Sample ID: LCS 580-274975/23-A
Matrix: Water
Analysis Batch: 275094

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 274975

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	0.500	0.512		mg/L		102	80 - 120

Lab Sample ID: LCSD 580-274975/24-A
Matrix: Water
Analysis Batch: 275094

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 274975

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper	0.500	0.488		mg/L		98	80 - 120	5	20

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: TruGrit Bioassy Testing

TestAmerica Job ID: 580-77368-1

Client Sample ID: Seep-2-20180517

Lab Sample ID: 580-77368-1

Date Collected: 05/17/18 11:30

Matrix: Water

Date Received: 05/17/18 12:09

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			274975	05/30/18 11:44	CJB	TAL SEA
Dissolved	Analysis	6020A		1	275094	05/31/18 11:21	FCW	TAL SEA

Client Sample ID: Dup1-20180517

Lab Sample ID: 580-77368-2

Date Collected: 05/17/18 11:35

Matrix: Water

Date Received: 05/17/18 12:09

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			274975	05/30/18 11:44	CJB	TAL SEA
Dissolved	Analysis	6020A		1	275094	05/31/18 11:25	FCW	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit Bioassy Testing

TestAmerica Job ID: 580-77368-1

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	10-31-18
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-80164-1
Client Project/Site: TruGrit Bioassay Testing
Revision: 1

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Jennifer Wynkoop

Authorized for release by:
10/1/2018 1:43:04 PM

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Landau & Associates, Inc.
Project/Site: TruGrit Bioassay Testing

TestAmerica Job ID: 580-80164-1

Job ID: 580-80164-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-80164-1

Comments

Revised report 10/1/18 to report to RL not MDL for dissolved copper.
Samples were run on an instrument with a collision cell.

Receipt

The samples were received on 9/7/2018 10:11 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 11.4º C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit Bioassay Testing

TestAmerica Job ID: 580-80164-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-80164-1	Seep-2-20180907	Water	09/07/18 09:28	09/07/18 10:11
580-80164-2	Dup1-20180907	Water	09/07/18 09:29	09/07/18 10:11

LANDAU ASSOCIATES

- [ ] **Seattle/Edmonds** (425) 778-0907
- [ ] **Tacoma** (253) 926-2493
- [ ] **Spokane** (509) 327-9737
- [ ] **Portland** (503) 542-1080
- [ ] _____

Chain-of-Custody Record

Date 9/7/2018

Page 1 of 1

80164

Project Name Tm Gnt Bioassay testing Project No. 0241008.020.022

Project Location/Event Alexander Ave - Seep Sampling

Sampler's Name KAM

Project Contact JwynKopp@landauinc.com/kmason@landauinc.com

Send Results To project contacts (above)

Testing Parameters

Turnaround Time
- [x] Standard
- [ ] Accelerated
- [ ] _____

Sample I.D.	Date	Time	Matrix	No. of Containers	Dissolved copper*
Seep-2-20180907	9/7/2018	928	Aq	1	X
Dup1-20180907	9/7/2018	929	Aq	1	X

Note
*method 6020A(ICPMS)
reporting limit: 0.0024 mg/L
No dilution

580-80164 Chain of Custody

Therm. ID: A2 Cor: 11.4° Uncr: 11.3°
Cooler Dsc: Sm-Blue
Packing: _ _ _ _ _
Cust. Seal: Yes ___ No X
Wet/Packs/Dry Ice/None
FedEx: ___
UPS: ___
Lab Courr: ___
Other: client

Observations/Comments

- [x] Allow water samples to settle, collect aliquot from clear portion
- [ ] NWTPH-Dx - run acid wash silica gel cleanup
- [ ] Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
- [ ] non-preserved
- [ ] preserved w/methanol
- [ ] preserved w/sodium bisulfate
- [ ] Freeze upon receipt

- [x] Dissolved metal water samples field filtered

Other Field filtered w/ 0.45 micron filter. In case narrative comment on use of collision cell tech. Sample is brackish water

Special Shipment/Handling or Storage Requirements

Method of Shipment Drop-off

Relinquished by	Received by	Relinquished by	Received by
Signature Kelsey Mason	Signature Tom Blankinship	Signature	Signature
Printed Name Kelsey Mason	Printed Name Blankinship	Printed Name	Printed Name
Company LAI	Company TA Sea	Company	Company
Date 9/7/2018 Time 1011	Date 9/7/18 Time 1011	Date Time	Date Time

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-80164-1

Login Number: 80164
List Number: 1
Creator: Blankinship, Tom X

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	Thermal preservation not required.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Client: Landau & Associates, Inc.
Project/Site: TruGrit Bioassay Testing

TestAmerica Job ID: 580-80164-1

Method: 6020A - Metals (ICP/MS) - Dissolved

Client Sample ID: Seep-2-20180907
Date Collected: 09/07/18 09:28
Date Received: 09/07/18 10:11

Lab Sample ID: 580-80164-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.0020		mg/L		09/26/18 10:06	09/27/18 13:53	1

Client Sample ID: Dup1-20180907
Date Collected: 09/07/18 09:29
Date Received: 09/07/18 10:11

Lab Sample ID: 580-80164-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.0020		mg/L		09/26/18 10:06	09/27/18 13:58	1

Client: Landau & Associates, Inc.
Project/Site: TruGrit Bioassay Testing

TestAmerica Job ID: 580-80164-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-284928/22-A
Matrix: Water
Analysis Batch: 285145

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 284928

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.0020		mg/L		09/26/18 10:06	09/27/18 12:08	1

Lab Sample ID: LCS 580-284928/23-A
Matrix: Water
Analysis Batch: 285145

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 284928

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	0.500	0.516		mg/L		103	80 - 120

Lab Sample ID: LCSD 580-284928/24-A
Matrix: Water
Analysis Batch: 285145

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 284928

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Copper	0.500	0.528		mg/L		106	80 - 120	2	20

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: TruGrit Bioassay Testing

TestAmerica Job ID: 580-80164-1

Client Sample ID: Seep-2-20180907

Lab Sample ID: 580-80164-1

Date Collected: 09/07/18 09:28

Matrix: Water

Date Received: 09/07/18 10:11

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			284928	09/26/18 10:06	JKM	TAL SEA
Dissolved	Analysis	6020A		1	285145	09/27/18 13:53	FCW	TAL SEA

Client Sample ID: Dup1-20180907

Lab Sample ID: 580-80164-2

Date Collected: 09/07/18 09:29

Matrix: Water

Date Received: 09/07/18 10:11

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			284928	09/26/18 10:06	JKM	TAL SEA
Dissolved	Analysis	6020A		1	285145	09/27/18 13:58	FCW	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Project/Site: TruGrit Bioassay Testing

TestAmerica Job ID: 580-80164-1

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Nevada	State Program	9	WA000502019-1	07-31-19
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19