Terrain Solutions, Inc.

Environmental Site Assessments • Land Resources Evaluation
Hydrogeology • Environmental Geology • Engineering Geology

ENVIRONMENTAL MEDIA ASSESSMENT

OF

SUNNYSIDE PARK
3502 BELLFORT STREET
HOUSTON, TEXAS 77051

PREPARED FOR

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EXECUTIVE SUMMARY

Terrain Solutions, Inc. (TSI) was engaged by Mr. Gabriel Mussio of City of Houston, General Services Department, to perform an Environmental Media Assessment of the Sunnyside Park, an approximately 25-acre tract of land located 3502 Bellfort Street, Houston, Texas 77051. Additionally, sediment and stormwater samples were collected along Reed Road near the intersection of Rosehaven Drive, at the rear of the WLD Johnson Branch library, 3517 Reed Road, and the Sunnyside Storefront Police Station, 3511 Reed Road. This assessment was performed in an effort to confirm the presence or absence of suspected contaminants on the subject site or at selected areas in the vicinity.

Sunnyside Park, the subject property, is located on the southwest corner of Comal Street and Bellfort Street in Houston, Texas. The park consists of a main building housing athletic recreation facilities, offices, and meeting rooms. Other amenities included two paved parking areas, tennis courts, an outdoor swimming pool, baseball fields, covered pavilion, public garden, and playground. The park is in an area that is developed with single family residences and E.M. Young Elementary school to the north; residences to the east; a storefront police station and library to the south; and the former Bellfort landfill to the south and west. Approximately 1,750 feet to the west is a concrete plant.

Stell Environmental Enterprises, Inc. (October 2010) performed a "Targeted Brownfields Assessment Phase II Environmental Site Assessment" on the Bellfort Landfill (Contract W9126G-06-D-0037, Del # 0024) which is located south and west of the Sunnyside park. The assessment of the Bellfort Landfill involved the drilling and installation of four temporary monitoring wells, twenty-three borings, and ten surface samples. Because of the chemical analysis of 12 soil samples and six groundwater and observation of the soil cores, the following conclusions were drawn:

- The landfill cap varies from two to eight feet.
- The landfill waste varies from two to forty-two feet and is composed of rubber, glass, plastic, brick and wood.

- Methane was detected at one boring location located 1400 feet from the Sunnyside park boundary.
- No elevated concentrations of volatile organic compounds were detected in field screening of the samples.
- No chemicals of concern (VOCs, SVOCs, or RCRA metals) were found in the surface soils tested above Protective Concentration Levels (PCLs).
- Several metals and a SVOC compound were found in the groundwater above the PCLs.

A review of the historical aerial photographs of the Sunnyside Park do not indicate the obvious presence of trash cells or piles. Residences were located along the eastern portion of the Park along Comal Street.

From February 14 to March 1, 2017, TSI personnel and representatives collected ten sediment and surface water samples from the perimeter of the park and at selected places near Reed Road after a rain event. Seven air samples were collected from the western and southern boundaries of the park. Additionally, ten borings were advanced in Sunnyside Park, four of which were converted to temporary monitoring wells. Ten soil and four groundwater samples were collected for chemical analyses.

Through sampling and chemical analysis, TSI has generally confirmed the absence of the suspected contaminants on the subject site.

Specifically, the assessment found:

- No landfill debris in the soil cores
- No detection of methane in the surface borings
- No soil staining or odors noted in the subsurface cores
- No regulatory exceedances of VOCs or silica dust through the analysis of the grab air samples

- No regulatory exceedances of Chemicals of Concern or pH through the analysis of stormwater sediment, subsurface soil, and groundwater samples
- One slight exceedance of lead was detected in a surface water sample collected after a rain event from a drainage swale located in the southeast corner of the park near Comal Street. The lead concentration of the water sample SPSW-06 contained 0.033 mg/l of total lead compared to the TCEQ Drinking Water PCL of 0.015 mg/l.

TSI was asked by the City of Houston to investigate further into the occurrence of the slightly elevated lead content in the stormwater sample. Two additional stormwater samples, SC-1A & SC-1B, were collected on March 29, 2017 approximately two hours into a rain event from the Comal Street Outfall entering the park and were analyzed for total lead (unfiltered) and dissolved lead (filtered). Additionally, the drainage areas that lead to the Comal Street outfall were visually assessed and were examined through the 2008 LIDAR elevation imagery. The following conclusions were drawn:

- The dissolved lead content was below Sample Detection Limits.
- The collected water sample was cloudy due to suspended sediments. The total lead content of the water sample was 0.031 mg/l that is above the ingestion level of 0.015 mg/l, similar to the last sample analysis.
- The areas that drain into the Comal Street Outfall are located to the south in the Former Bellfort Landfill which is elevated approximately 25 feet above the park. Rain water flows through at least two steep drainage ways eastward from the eastern side of the Bellfort tract and then is directed mainly northward in a narrow swale that is orientated on the eastern boundary of the fenced tract. Water finally drains to the park through the Comal Street Outfall. The drainage areas are generally covered by grasses, brush, and trees with only minor signs of concrete debris.

- The nearest historic waste cell was located 1,100 feet from the outfall so an impact from a typical rain event is unlikely.
- The ponded rainwater at the Comal Street Outfall was totally evaporated or migrated from within two days of the rain event.
- The lead content of the surface sediments collected from the park varies from 0.4 mg/kg to 39.3 mg/kg and therefore suspension of these sediments in the rainwater could impact the analysis of total lead content in water samples.

Based on the current evidence, chemical testing, and observations, TSI believes the elevated lead content of the stormwater observed at the Comal Street Outfall was caused by the inclusion of small clay particles that naturally contain lead that were brought into suspension by the steep discharge slopes on the eastern boundary of the Bellfort Landfill.

In accordance with the findings and conclusions listed in this report, Terrain Solutions, Inc. has not found concentrations of the suspected contaminants in the tested media that exceeded health standards. No evidence was found that the subject site has been impacted adversely by the closed Bellfort landfill nor has Sunnyside Park been subjected to landfill use. TSI does recommend that the City of Houston consider fencing off the area that typically contains the standing water entering the park at the Comal Street Outfall.

This executive summary does not fully describe Terrain Solutions, Inc.'s findings, conclusions, opinions, and recommendations or the basis upon which they were determined; such information is conveyed via the entirety of the report.

INTRODUCTION

OBJECTIVE

Terrain Solutions, Inc. (TSI) was engaged by Mr. Gabriel Mussio of the City of Houston, General Services Department to perform an Environmental Media Assessment of a 25- acre tract of land identified as "Sunnyside Park" located 3502 Bellfort Street. This assessment was performed to confirm the presence or absence of suspected contaminants on the subject site.

PROJECT SCOPE AND BASIS OF ASSESSMENT

The invasive subsurface assessment was performed in general conformance with the authorized proposal. ***Accordingly, this assessment included sampling and invasive testing of the subject property based on the identification and/or suspicion of adverse environmental conditions, such as the use of the property as a landfill or the possible migration of contaminants from an adjacent municipal landfill.*** The assessment is dependent on several factors, including, but not limited to field conditions, budget, allotted time schedule, the position of utility and subsurface structures, weather, and tenant/occupant terms. During this study, a reasonably thorough attempt was made to confirm the presence or absence of subsurface impacts. Because of the limitations inherent in invasive assessments, as listed above, our findings, conclusions, opinions, and recommendations can be considered probabilities only.

TSI has applied the level of attention and expertise that is normally exercised by environmental professionals performing this type of assessment. TSI reserves the right to alter its conclusions and recommendations based on our review of any information obtained after the date of this report. No warranty, express or implied, is made as to the professional information included in this report.

PROFESSIONAL QUALIFICATIONS

The Primary Investigator was Matthew R. Cowan, P.G. (Texas 1263), CAPM (0042). Mr. Cowan has over 20 years of experience in geological and environmental applications. Mr. Cowan holds a B.S. in Geology from Texas A&I University, Kingsville Texas and a M.S. in Geology from

Texas A&M University-Kingsville, Kingsville Texas. He is a Licensed Professional Geologist (P.G. # 1263) in the State of Texas and is a Corrective Action Project Manager (CAPM # 0042).

Mr. Glenn Lowenstein, P.G., C.A.P.M., Program Manager, assisted Mr. Matthew Cowan with this invasive assessment. Mr. Lowenstein has over 25 years of professional experience in environmental and geological applications, which include environmental site assessments, UST investigations, and geologic studies of surface faults. He has performed environmental site assessments for both public and private sector projects. Mr. Lowenstein holds a B.S. in Geology from Queens College and a M.S. in Geology from Texas A&M University, College Station, Texas. He is a Licensed Professional Geologist (P.G. # 28) in the State of Texas and is a Corrective Action Project Manager (CAPM # 116).

PROJECT BACKGROUND

Stell Environmental Enterprises, Inc. (October 2010) performed a "Targeted Brownfields Assessment Phase II Environmental Site Assessment" on the Bellfort Landfill (Contract W9126G-06-D-0037, Del # 0024) which is located south and west of the Sunnyside park. The assessment of the Bellfort Landfill involved the drilling and installation of four temporary monitoring wells, twenty-three borings, and ten surface samples. Because of the chemical analysis of 12 soil samples and six groundwater and observation of the soil cores, the following conclusions were drawn:

- The landfill cap varies from two to eight feet.
- The landfill waste varies from two to forty-two feet and is composed of rubber, glass, plastic, brick and wood.
- Methane was detected at one boring location located 1400 feet from the Sunnyside park boundary.
- No chemicals of concern (VOCs, SVOCs, or RCRA metals) were found in the surface soils tested above Protective Concentration Levels (PCLs).
- Several metals and a SVOC compound were found in the groundwater above the PCLs.

A review of the historical aerial photographs of the Sunnyside Park obtained by examination of Goggle Earth and selected aerials obtained from TNRIS do not indicate the obvious presence of trash cells or piles. As visible in the 1953 aerial photograph, residences were located along the eastern portion of Sunnyside Park along Comal Street with the remainder of site vacant with an unpaved access road west of the park orientated southwest towards the landfill. A copy of the 1953 aerial is included in the Appendix.

This scope of this assessment is designed to confirm the presence or absence of pollutants typically associated with municipal landfills in the subsurface under Sunnyside Park or have migrated on-site through groundwater transport. Additionally, the assessment will collect air samples and stormwater run-off samples from the perimeters of the Sunnyside Park and stormwater run-off samples from the boundaries with the HPD storefront, Johnson library, and drainage areas along Reed Road shared with the closed Bellfort landfill to confirm the presence or absence of selected pollutants.

PHYSICAL SETTING

SITE AND VICINITY DESCRIPTION

Sunnyside Park, the subject property, is located on the southwest corner of Comal Street and Bellfort Street in Houston, Texas. The park consists of a main building housing athletic recreation facilities, offices, and meeting rooms. Other amenities included two paved parking areas, tennis courts, an outdoor swimming pool, baseball fields, covered pavilion, public garden, and playground. The park is located in an area that is developed with single family residences and E.M. Young Elementary school to the north; residences to the east; a storefront police station and library to the south; and the former Bellfort landfill to the south and west. Approximately 1,750 feet to the west is a concrete plant.

GEOLOGY

A review of the Bureau of Economic Geology 1982 Geologic Atlas of Texas Houston Sheet indicates the geologic formation underlying the study area is the Beaumont Formation. The Beaumont Formation was deposited during the Pleistocene Epoch, a geologic time period that began about 1.8 million years ago and ended about 10 to 15 thousand years ago with the retreat of the last continental glaciers in North America. The Beaumont Formation is primarily fluvial (river-derived) in origin and consists of interbedded layers of clay, sand, and silt. Geomorphic features associated with the Beaumont include pimple mounds and shallow, circular depressions.

SOILS

According to the USDA Soil Conversation Service's *Soil Survey of Harris County, Texas*, published in 1976, the soil type found at the subject property is **Bernard-Edna complex, 0 to 1 percent slopes** and is described as follows:

> *Component: Bernard (60%)*
>
> *The Bernard component makes up 60 percent of the map unit. Slopes are 0 to 1 percent. This component is on flats on flat coastal plains. The parent material consists of clayey fluviomarine deposits derived from igneous, metamorphic and sedimentary rock. The Bernard is composed of: 0 to 6 inches:* clay loam and clay from *6 to 80 inches. Depth to a root restrictive layer is greater than*

60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is high. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, December. Organic matter content in the surface horizon is about 3 percent. This soil does not meet hydric criteria.

Component: Edna (20%)

The Edna component makes up 20 percent of the map unit. Slopes are 0 to 1 percent. This component is on flats on coastal plains. The parent material consists of loamy fluviomarine deposits derived from igneous, metamorphic and sedimentary rock. The Edna is composed of: 0 to 9 inches: loam; *9 to 50 inches; and 50 to 80 inches:* sandy clay loam. *Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 9 inches during January, February, March. This soil does not meet hydric criteria.*

TOPOGRAPHIC MAP REVIEW

The 2016 U.S.G.S. topographic map for Park Place, Texas shows the subject property to be relatively flat with a slight slope to the northeast. Sunnyside Park varies from an elevation of 50 feet above MSL in the west and south to 45 feet in the north and east.

The former Bellfort landfill, to the south and west, varies in elevation from 75 feet MSL to 50 feet and slopes steeply towards the park.

The nearest natural stream is Sims Bayou located approximately 7,800 feet to the southeast. Sims Bayou flows northeastward towards Buffalo Bayou and then eastward towards the Gulf of Mexico.

HYDROGEOLOGY AND SURFACE HYDROLOGY

Harris County is located within the Gulf Coast Aquifer System, which includes the Chicot and Evangeline Aquifers. The Chicot is the uppermost aquifer and extends to the surface in the study area. Shallow groundwater, which can be found at depths of less than 30 feet in the study area, is from the Chicot. Depth to shallow groundwater can vary with the seasons and with weather patterns. Groundwater movement direction is variable from location to location and may not

follow the surface flow direction. Shallow groundwater is generally not used as a water source and is not considered potable.

At greater depths, the Chicot Aquifer produces sufficient quantities of water that is suitable for domestic, commercial, and light industrial purposes. The Evangeline Aquifer, which underlies the Chicot in the study area and is found at depths of approximately 800 feet, is the major producer of groundwater in the Houston Metropolitan Area. These deeper zones of water production are usually hydraulically discontinuous with the overlying, groundwater-bearing, shallow sands and silts.

Storm water runoff appears to drain south-north through swales and culverts located on the west side and east sides of the Park towards the north. There is an east-west swale in the northern section that may drain off-site in a northeastern direction. A small detention pond is adjacent the western swale along the northern boundary of the park.

FIELD INVESTIGATION

SURFACE WATER AND SEDIMENT SAMPLING

Following rains on the evening of February 13, 2017 and the morning of February 14, 2017, Mr. Pete Berveiler, Principal Engineer, and Mr. Glenn Lowenstein, Principal Geologist, mobilized to the subject site. Mr. Berveiler and Mr. Lowenstein marked the six proposed sampling locations (SPSD-01/SPSW-01 through SPSD-06/SPSW-06) inside the Park along the fence line where runoff from the adjacent property could have passed through in standing water. The field crew then departed the park to identify the remaining locations as recommended by the City of Houston. These locations (SPSD-07/SPSW/07 through SPSD-10/SPSW-10) were selected based on observed ponding at locations identified by the City of Houston personnel and concerned residents where surface water had migrated towards Reed Road near Johnson Library and the Houston Police Department Storefront near Comal and Reed Road. In addition, two locations along Reed Road near the intersection of Reed Road and Rosehaven Drive, and near the bus stop to the east of that intersection were identified and marked for sample collection.

The field crew then returned to the Park to perform the sampling of SPSD-01/SPSW-01 and SPSD-02/SPSW-02 and continued around the perimeter collecting shallow soil and surface water samples at each location, with the exception of SPSW-08, which no longer contained sufficient quantity of water from which a sample could be collected due to absorption into the soil and continued runoff during the course of sampling.

Subsequently, the samples were delivered to A&B Labs, a NELAC accredited laboratory on Wednesday, February 15, 2017 within the permitted holding times for all samples.

In accordance with the industry standard of care, all sample containers were provided by the accredited laboratory. Prior to and after each sample, the non-disposable sampling apparatus were decontaminated with a 3-stage rinse, consisting of a water-alconox mixture, followed by a clean water rinse and a second clean water rinse. All sediments were initially collected using gloved hand techniques or decontaminated hand tools. This material was placed in a uniquely labeled, sealable bag. Headspace readings were taken by a PID, and recorded on the daily summary log from each bag within 10 minutes of sample collection.

Samples were then transferred from the sealed bags into laboratory-prepared glassware using the included SW-846 5035-A collection device (Terra-Core sampler) for TX-1005 Total Petroleum Hydrocarbons (TPH) and Volatile Organic Compounds (VOC) by ASTM method 8260. Samples were then manually placed in the other laboratory-prepared glassware for the Method 8270 semi-volatile organic compounds (SVOC) list, the RCRA metals list (ASTM Methods 6010 and 7470), and for Moisture.

For surface water, a mass quantity of liquid was captured from the target location using a decontaminated transfer bottle. This allowed all the samples to be captured in one grab sample. The bottle was then used to transfer material to the laboratory-provided pre-cleaned and preserved glassware. Volatile Organic Compounds (VOC) and Total Petroleum Hydrocarbon (TPH) samples were decanted first. SVOC were decanted second, and RCRA metals were decanted third.

Two additional surface water samples, SC-1A & SC-1B, were collected on March 29, 2017 approximately two hours into a rain event from the Comal Street Outfall entering the park and were analyzed for total lead (unfiltered) and dissolved lead (filtered). See the Appendix for stormwater sediment and surface water sampling locations.

Containers were then placed into a chilled transport cooler for transport to A&B Laboratories in Houston, Texas, a NELAC-Accredited facility. Any re-used sampling materials or implements were cleaned before each sample collection activity using the above-referenced triple-rinse, including Alconox/water scrub, and double pressurized rinse.

AIR SAMPLING

Mr. Berveiler returned to the subject site at 7 AM on the morning of Saturday, February 18, 2017 to set the air sampling canisters. The canisters were suspended at the approximate 4-foot elevation mark from either a fence or a tree branch to represent an equivalent breathing zone collection point. Mr. Berveiler returned at 3 PM of the same day to retrieve the canisters. The canisters were delivered to the A&B Labs on Monday, February 20, within the permitted holding times for all samples. In accordance with industry standard practice, the laboratory provided the field crew with prepared summa-style vacuum canisters with 8-hour regulators. Once attached, the bottles were opened, and the regulators would permit the inflow of air intended to represent a time-weighted average of a typical 8-hour exposure. The canisters were retrieved and closed, and returned to the laboratory for analysis by method TO-15 for VOC. See the Appendix for air sampling locations.

The airborne particulate monitoring for crystalline silica was conducted by Mr. Greg Lall, Project Manager, on March 1, 2017, using portable battery operated pumps drawing air through 37 millimeter cassettes loaded with 5 Micron PVC filters. The samples were delivered to A&B Environmental Services, Inc., an American Industrial Hygiene Association (AIHA) accredited and Department of State Health Services (DSHS) licensed laboratory, located at 10100 East Freeway, Suite 100, in Houston, Texas 77029. Samples were analyzed by X-Ray Diffraction in accordance with National Institute for Occupational Safety and Health (NIOSH) Method 7500. Analysis results were compared to the Recommended Exposure Limit (REL) of 0.05 milligrams per cubic meter (mg/m^3) of air.

SUBSURFACE SOIL AND GROUNDWATER SAMPLING

On February 22nd and 23rd of 2017, Mr. Matthew R. Cowan, TSI's Project Manager, supervised the drilling and installation of four temporary monitoring wells and six soil borings. The borings were placed in the following locations:

BORING LOCATIONS

BORING ID.	LOCATION	TERMINATION DEPTH (Feet)
ST-1	Northwest portion of the park	24
ST-2	Western side of the park	24
ST-3	Southern side of the park	24
ST-4	Eastern side of the park	24
SB-1	Southeast corner of the Tennis court	16
SB-2	Practice ball field	16
SB-3	North of practice ball field	16
SB-4	Between the two southern ball fields	16
SB-5	Eastern side of the park	16
SB-6	Northeastern side of the park	16

SOIL SAMPLING

Soil samples extracted from the Geoprobe were collected in dedicated 2-inch x 4-foot acetate sleeves and were sliced open in the field for lithologic description and organic vapor analysis with an Organic Vapor Meter or Photoionization Detector (OVM/PID). Soil samples were split in half and placed in labeled resealable plastic bags. One set from each depth interval was placed in a cooler for potential chemical analysis and the other set was set aside for headspace analysis. After approximately fifteen minutes, the probe of a PID was placed in each bag and the concentration of organic vapors in the headspace was measured in parts per million (ppm) and recorded for each chosen depth interval. One section of the core from each boring was chosen for chemical analysis based on organic vapor readings, signs of staining in lieu of obvious indications of contamination,

the termination depth or a representative soil core interval. Each open boring was probed with a landfill gas meter upon completion to detect escaping methane vapors.

Ten selected soil samples were placed in a laboratory-supplied Terra-core kits (6 x 40ml VOAs) and glass jars (4-oz. capacity), stored in a cooler with ice, and transported under Chain-of-Custody to A&B Labs in Houston, Texas. The soil samples were analyzed for the presence of Total Petroleum Hydrocarbons (TPH, Method 1005), RCRA Metals (Methods 6010B and 7470), Volatile Organic Compounds (VOCs by Method 8260), Semi-Volatile Organic Compounds (SVOC by Method 8270), and pH, using the Texas Risk Reduction Program (TRRP) detection limits.

Non-disposable sampling such as the hand-auger or sampling trowel was decontaminated before or after a sample by washing the tool in water –alconox mixture and then rinsing the tool with distilled water. When obvious signs of contamination are detected in the soil strata that the sampling tool penetrates, an isopropyl alcohol wash was used prior to the distilled water rinse.

GROUNDWATER SAMPLING

Four temporary monitoring wells were advanced to a depth of 24 ft. below ground surface and a groundwater sample was collected from a 1-inch diameter slotted casing via a peristaltic pump and disposable hosing. Each monitoring well was composed of 10 feet of flush-mount Schedule 40 PVC riser, 15 feet of 0.01-inch screen.

Approximately 1-2 gallons of groundwater were removed from each well until relatively sediment-free water was obtained.

The groundwater samples were collected in six 40 mL vials, 500 mL plastic bottle, 250 mL plastic bottle and a 1 L amber jug, placed in a cooler with ice, and transported under Chain-of-Custody to A&B Labs in Houston, Texas. The groundwater samples were analyzed for the presence of Total

Petroleum Hydrocarbons (TPH, Method 1005), RCRA Metals (Methods 6010B and 7470), Volatile Organic Compounds (VOCs by Method 8260), Semi-Volatile Organic Compounds (SVOC by Method 8270), and pH, using the Texas Risk Reduction Program (TRRP) detection limits.

BOREHOLE PLUGGING AND ABANDONMENT

The borings were filled with bentonite upon completion.

WASTE HANDLING

The soil cuttings and unused samples were stored in one labeled fifty-five gallon labeled ring-top drum was stored off-site for subsequent disposal. Sampling materials and consumables were disposed off-site in a dumpster.

RESULTS

ANALYTICAL CHEMICAL RESULTS

STORMWATER SEDIMENTS

For this site, the appropriate regulatory drivers for sediments are the most conservative soil Protective Concentration Levels (PCLS), as the surface water is intermittent, and no consumable fauna are present for uptake into any human in this park. Under the TCEQ regulations, the most conservative PCL is the most current (December 2016) least published values, in this case the Residential Total Soil Combined ($^{TOT}SOIL_{COMB}$) PCL. Since this site is greater than a 30-acre potential source area, those tables were used as inputs for this study.

Naturally occurring metals were detected within acceptable ranges in sediments. TPH and VOC were reported as non-detect in the laboratory report. The only SVOC reported as detected above the detection limits was bis (2-ethylhexyl) phthalate, a plasticizer and known lab contaminant. It was reported 3 orders of magnitude in concentration below the PCL in sample SRSD-10. The pH of the sediments was considered within the normal range for the area.

See the Appendix for a summary of these results.

SURFACE WATER

For surface water, due to the intermittent status of the body of water, and lack of consumable fauna for potential uptake, the most appropriate PCL is the most current (December 2016) Groundwater Ingestion standard, $^{GW}GW_{ING}$.

Only naturally occurring metals were detected above the detection limits in any surface water samples collected from this site. Only one sample, SPSW-06, was reported by the lab to have a result (0.033 mg/L) exceeding the Residential Tier 1 Protective Concentration Limit (0.015 mg/L).

The results of the subsequent analyses of two surface water samples, SC-1A & SC-1B, collected on March 29, 2107 indicated:

- The dissolved lead content was below Sample Detection Limits.
- The total lead content, which included suspended sediments observed as cloudiness, contained 0.031 mg/l that is above the ingestion level of 0.015 mg/l, similar to the last sample analysis.

The drainage areas that lead to the Comal Street outfall were visually assessed and were examined through examination of the 2008 LIDAR elevation imagery. The upgradient areas that drain into the Comal Street Outfall are located to the south in the Former Bellfort Landfill which is elevated approximately 25 feet above the park. Rain water flows through at least two steep drainage ways eastward from the eastern side of the Bellfort tract and then is directed mainly northward in a narrow swale that is orientated on the eastern boundary of the fenced tract. The water finally drains to the park through the Comal Street Outfall. The drainage areas are generally covered by grasses, brush, and trees with only minor signs of concrete debris. A topographic map, a LIDAR (Light Detection and Ranging) map with water drainage pathways, and photographs of the drainage areas are included in the Appendix.

AIR

VOCs

For ambient air, the appropriate regulatory comparison values are the Air Monitoring Comparison Values (AMCVs) published by the EPA and TCEQ. The AMCVs are based on Effects Screening Levels, or ESVs. Over the long-term, the chronic ESV provides the most conservative comparison value for an 8-hour equivalent exposure. The only detected constituent under Method TO-15 was methylene chloride, in two containers: NW-01 and S-01. The ESV for methylene chloride is 330 parts per million. The results for methylene chloride were 4.4 ppm in NW-01 and 5.2 ppm in S-01. Methylene chloride is a known lab contaminant for decontaminating metal containers, like these summa canisters. In addition, because the Henry's constant for methylene chloride is 1.34,

the probability of its survivability in nature outside a few feet away from a manufacturing process is negligible, we can presume that these results are lab contaminants, and not indicative of the presence of methylene chloride at this site.

Silica Dust

The test results did not show elevated concentrations of silica dust at the Sunnyside Park site. The laboratory analysis shows that the concentrations are Below the Reporting Limit (BRL). Concentrations were less than 0.0142 mg/m^3, which is lower than the REL of 0.05 milligrams per cubic meter (mg/m^3) of air.

See the Appendix for a summary of these results.

SUBSURFACE SOIL CONDITIONS

Based on the boring descriptions, the subsurface consists of top soil fill material in the upper 2 to 4 feet followed by a clay with an increasing amount of sand transitioning from a clayey sand to a water-bearing sand at a depth 23 to 24 feet below the ground surface. Soil boring logs are presented in the Appendix.

FIELD MEASUREMENTS AND OBSERVATIONS

- None of the soil cores had any signs of staining or odor. The soil cores did not reveal any indications of landfill debris.
- Readings from a PID were recorded on the soil borings. The readings ranged from zero to one part per million.
- No methane was detected in the borings during drilling or associated with the soil cores.

ANALYTICAL CHEMICAL RESULTS

Soil discussion

The analytical results for the ten soil samples submitted for analysis found that there were no chemicals of concern that were detected above the TCEQ Tier 1 Protective Concentrations levels for $^{TOT}Soil_{COMB.}$ - the health-based regulatory concentrations. The pH of the subsurface soils was within normal range for the area.

Groundwater discussion

The analytical results for the four groundwater samples submitted for analysis found that there were no chemicals of concern that were detected above the TCEQ Tier 1 Protective Concentrations levels for $^{GW}GW_{ING.}$ - the health-based regulatory concentrations. The pH of the groundwater was within normal range.

FINDINGS & CONCLUSIONS

TSI has completed an Environmental Media Assessment, through the observation, collection, and chemical analysis of stormwater sediment, surface water, air, subsurface soil, and groundwater samples from the Sunnyside Park and vicinity in general accordance with the authorized TSI's Proposals. Through invasive testing, TSI has generally confirmed the absence of the suspected contaminants on the subject site.

Specifically, the assessment found:

- No landfill debris in the soil cores
- No detection of methane in the surface borings
- No soil staining or odors noted in the subsurface cores
- No elevated concentrations of volatile organic compounds detected in field screening of the samples
- No regulatory exceedances of VOCs or silica dust through the analysis of the grab air samples
- No regulatory exceedances of Chemicals of Concern or pH through the analysis of stormwater sediment, subsurface soil, and groundwater samples
- One slight exceedance of lead was detected in a surface water sample collected after a rain event from a drainage swale located in the southeast corner of the park near Comal Street. The lead concentration of the water sample SPSW-06 contained 0.033 mg/l of total lead compared to the TCEQ Drinking water PCL of 0.015 mg/l. Subsequent surface water analysis and field observations indicated the elevated lead content of the stormwater observed at the Comal Street Outfall was caused by the inclusion of small clay particles that naturally contain lead brought into suspension by the steep discharge slopes on the eastern boundary of the Bellfort Landfill. The reasons for this conclusion are:
    - The nearest historic waste cell was located 1,100 feet from the outfall so an impact of landfill waste on rainwater during a typical rain event is unlikely.

- The lead content of the surface sediments collected from the park varies from 0.4 mg/kg to 39.3 mg/kg and therefore suspension of these sediments in the rainwater could impact the analysis of total lead content in water samples.

Additionally, the only risk to human health is ingestion of the rainwater from the Comal Street Outfall which is unlikely and the standing rain water was observed to be evaporated or migrated from the area within several days of the rain event.

OPINION & RECOMMENDATIONS

In accordance with the findings and conclusions listed in this report, Terrain Solutions, Inc. has not found concentrations of the suspected contaminants in the tested media that exceeded health standards. No evidence was found that the subject site has been impacted adversely by the closed Bellfort landfill nor has Sunnyside Park been subjected to landfill use. TSI does recommend that the City of Houston consider fencing off the area that typically contains the standing water entering the park at the Comal Street Outfall.

WARRANTY AND LIMITATIONS

During the course of this study, a reasonably thorough attempt was made to confirm the presence or absence of suspected contaminants in the subsurface of the subject site. Due to the limitations inherent in sample collection, there is the possibility such adverse environmental conditions may escape detection due to the presence of surface obstructions, utilities, or the lack of readily available knowledge regarding past facility management practices, chemical or equipment usage.

TSI has applied the level of attention and expertise that is normally exercised by environmental professionals performing this type of assessment. TSI reserves the right to alter its conclusions and recommendations based on our review of any information obtained after the date of this report.

This report was prepared pursuant to the agreement that Terrain Solutions, Inc. has with the client. That contractual relationship included an exchange of information about the subject site that was unique and between Terrain Solutions, Inc. and its client and serves as the basis upon which this report was prepared. Because of the importance of the communication between Terrain Solutions, Inc. and its clients, reliance or any use of this report by anyone other than the following entities: City of Houston, General Services Department, or the client for whom it was prepared, is prohibited. Use by any such third party without explicit authorization in the report does not make said third party a third party beneficiary to Terrain Solutions, Inc.'s contract with the client.

Any such unauthorized reliance on or use of this report, including any of its information or conclusions, will be at the third party's risk. ***For the same reasons, no warranties or representations, expressed or implied in this report, are made to any such third party and no other warranty or guarantee, expressed or implied, is made or offered.***